

Lehman Brothers monthly risk meeting – package dated 5/31/05, meeting held 6/16/05

## Market Trends

- Equity markets were strong. Within the credit space, the CDX came in tighter by 23BP. There was a flight to quality, from HY to emerging markets. The HY market rallied on the back of GM (which tightened by 500bp, while GMAC came in 300bp), and the market sold into the rally at the end of the month. Strong demand has continued for LBOs, with a strong pipeline. The sponsors are very liquid right now, and loan syndication remains strong (bonds are moving as well). Treasuries had a big rally, but have given up some of the gains in early June. Volatility declined during the month. In FX, the big story was the Euro's 4.4% fall after the EU Constitution was rejected in France and the Netherlands. The Yen stabilized upon China's statement, that they would not break the peg in the near future. Mortgage production remains strong, although there is less incentive to go into ARMs with the flattening of the curve. However, ARMs still make up 45% of the market, and many believe that this mix is a structural change to the market that is not dependent on a movement in the yield curve (a true inversion of the curve could change this, however).

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## Market Risk

- Firm VaR increased 3.3M to 27.5M. Within Fixed Income, VaR rose by 1.4M to 25.0M. Within equities, VaR rose 2.9 to 10.0M.
- Within fixed income, IR products had a VaR reduction of 2.5M, due to a reduced exposure in a mortgage joint venture. They business was also flatter between the US and European curves. Mortgages saw a drop of 2.7M, as they were less short total exposure, and reduced the mortgage basis exposure. FX decreased by 3.0M, as it flattened out exposures (particularly in regards to the Yen). Despite all of these decreases, overall fixed income VaR rose. Those is due to less diversification between rates and mortgages, as both reduced their exposures they moved in the same direction. Jeff Goodman worked with Manhua to determine why this had happened – the process involves looking at the P&L vectors for individual businesses to determine what drove the VaR and which are the common factors across businesses.
  - In the past week, mortgage spreads have hit an all time tight. In early May, The LIBOR OAS current coupons were at -8. Last Friday, spreads tightened to -16. The LIBOR OAS is the spread across the LIBOR swap curve for mortgages (it takes into account prepayments). It is considered very rich at -16, and the desk is taking off its shorts, assuming it cannot tighten much further.

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However, Lehman noted that the desk may put on new shorts in the future.

- Within equities, convertibles increased its VaR by 1.4M. This was due to activity in this area, including a 2.2 billion issuance. Convertibles were trading rich prior to the credit market correction, but are now 1-2 points cheap and the desk saw an opportunity.

### **Credit Risk**

- Within global high yield, funded commitments nearly doubled in the customer cyclical category. This was driven by a refinancing of a large funeral home in France. This was done to pay out dividends to the sponsor. In US, this type of deal would be syndicated prior to close. In Europe, the deal is funded then syndicated. This shows up on the report as a 431M exposure, that amount has since been reduced through syndication. The sponsor had worked debt down to pre-buyout levels (they have held the company for 18 months since the initial buyout). While the equity markets are more demanding when it comes to this type of dividend-driven recapitalization, and want a sponsor to have been holding the company for a set period of time, the bank debt market tends to be less demanding. Most members of the original bank group stayed in the deal and increased their exposure.
- Equity finance had a 1B decrease in CE, due to a decline in agent lending (to players like BONY and State Street, occurs when Lehman borrows securities)
- The acquisition finance pipeline remains strong. In some cases, Lehman backs multiple sponsors looking for the same property. They run entirely independent deal teams. Sponsors do not have a problem with this, and the commitment would only appear once in the risk appetite.
- Hedge fund update: The funds in the credit space recovered their losses, unless they were short credit (long protection). In that case, they were hurt by the rally when the correlation trades came back. The real story is with the convertible bond funds. Some funds were down 5 to 10% over the last month, and 10% over the year. They have been seeing redemptions in the space. A few days ago, Marin announced that it was closing its CB fund. They had already instituted a gate, which Jeff Glibert described as “declaring war on your investors.” It appears to be a sort of “nuclear option.” Credit noted that fund managers generally receive 2% of AUM, as well as 20% of the profits based on a high-water mark. When a fund’s NAV falls significantly, it is hard to re-reach that high-water mark and therefore attain the performance fees. As many funds calculate overhead costs based on obtaining the performance fees, they experience difficulty when forced to operate with only the 2% AUM. Jeff Glibert noted that one fund has recently laid off 20% of its staff. He noted that as of now, they were not laying off

support stuff considered critical to governance, but that this could be an area of concern. So far, no hedge funds have missed margin calls at Lehman, and credit has not heard rumors of this occurring at other places. On the prime brokerage side, Lehman has seen lower balances, particularly within the CB space, as firms prepare to liquidate in order to meet June 30 redemptions. They have not seen these issues with the relative value, credit, and emerging market funds. Overall, hedge funds are not doing that well this year, with 40% of funds down. They expect to see best in class migration, in part due to the hot money from fund of funds.

LHB 6/17/05

Financial Update (Ed Grieb)

- Net revenues were the second highest (after December 2004)
- 200M pipeline in banking
- 2<sup>nd</sup> highest sales credits on record (indication of overall business levels)
- Strong across the board (esp. real estate, high yield, and munis)

Credit Risk (Jeff Glibert)

- The main driver of changes in Lehman's current exposure came from the equity finance side. This business consists of the stock borrow business, and the counterparties consist of banks and big mutual funds. Current exposure increased from \$4.936 bil last month to \$5.653 bil. Correspondingly, current exposure for counterparties rated iA (mainly counterparties in this business) increased from \$6.105 bil to \$7.193 bil.
- The top 20 clients by exposure continue to be predominantly investment grade. There is only one non-investment grade counterparty, a British counterparty that operates a chain of pubs, with whom Lehman has an interest rate swap. They are rated iBB+, and have current exposure of \$132 mil and a maximum potential exposure of \$179 mil.
- The commitments in the communication sector increased over last month from \$502 million to \$1,135 million. The amount funded increased modestly from \$232 to \$257 million. This was due to two large European deals in this space. As discussed in last month's writeup, European deals can only be syndicated post-closing. The first, larger deal was acquisition financing for a Greek telecom company. As of now, Lehman has fully syndicated the revolver. The Bridge was funded June 15, and there is a take-out bond offering scheduled for September. The second deal was acquisition financing for a French cell phone operator. The deal will close in August and they anticipate being down to their hold level at that time.
- Jeff gave us an update on the current situation with hedge funds.
  - In the convert bond space, which has been experiencing negative returns since April, they have found that a couple of funds are closing shop and returning money to investors. In Jeff's view, this is a rational decision on the part of fund managers, who do not get paid a performance fee until they hit their "high-water mark."<sup>1</sup> Lehman tracks the performance of approximately 800 hedge funds from which they receive proprietary performance information by virtue of being one of Lehman's clients. They have calculated that convert arb hedge funds experienced

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<sup>1</sup> That is, with most funds, the manager will not receive a performance fee, or incentive fee, until the returns surpass the fund's historical best return.

approximately \$1 billion in capital outflows during the quarterly redemption period ending June 30.

- During the month of June, the performance of hedge funds was picking up. Converts were cheap, and thus these funds actually did ok. Credit funds also did well as a result of credit spreads grinding tighter throughout the month.
- Overall, the credit picture was not bad. Lehman had no counterparties default, and they haven't heard of any defaults on the rest of the Street. Lehman did experience some breaches on the ISDA docs, either by counterparties breaking through minimum NAV triggers or maximum performance declines. The resulting exposures, though, were modest. After a case by case analysis, Lehman dealt with these funds in one of two ways.
  - First, for some counterparties, they chose to reserve, but not waive, their rights under the ISDA documentation. This means that they put the hedge fund on notice that they acknowledge the fund breached the triggers and Lehman reserves the right to close them out at any point in the future. While they are not closing them out immediately, this is not a good position for the hedge funds, with a default basically hanging over their heads.
  - Second, they reset the covenants to the new NAV or performance levels. They did this if, after analysis, they thought the fund was sufficiently stable.
  - No funds have been closed out at this point.
- Interestingly, through May, Lehman is finding in its analysis of its 800 hedge fund counterparties, that only 60% of the funds have positive performance year to date. This means that 40% of funds will not be receiving incentive fees due to high water mark clauses.
- Within the leveraged finance business, the pipeline remained as strong as it has ever been. Lehman is facing increased competition from banks and financial sponsors, but there is currently a tremendous supply of deals. In the market, they are seeing that leverage multiples are not coming down, and deal sizes keep increasing.
  - The auto parts sector continues to experience pain. They are seeing multiple restructurings and bankruptcies. Historically, this sector was able to obtain leverage by having OEM contracts. These contracts are not as valuable today, because of the squeeze from the OEMs.
  - Recaps continue to be a major force in the market. In spite of some investor resistance to these deals, Lehman remains comfortable doing them if they are comfortable with the enterprise value of the deal. They are finding high renewals by banks that were originally part of the deals,

which shows them that there is comfort in the marketplace for certain high-quality deals.

- OPSRA followed up on the current exposure to the Republic of Italy resulting from the very large swaps Lehman engaged in a few months ago. The swaps are in Italy's favor now as a result of market moves, and thus Italy has a negative current exposure of several hundred million dollars. There has been no talk from Italy on wanting to monetize the gains by entering into new swaps.

M. Danis, version 7/21/05

### Market Risk (Paul Shotten)

- Firmwide VaR was up by 7.0M, driven primarily by fixed income. Implied diversification benefits were down, but there is no major story here.
- Fixed Income VaR increased by 7.3M to 25.0M. This was driven by an increase in IR products (increasing the spread by position by 1m/bp), an increase in credit businesses (increased long positions in high grade credit within emerging markets), and increases in mortgage trading (bought securitized ARM pools which make the businesses short rates, and the desk head but on a macro hedge against a downturn in origination (We will confirm this story with Paul next month – ostensibly, the desk head would put on a long rates position)).
- Equities VaR decreased by 1.5M to 10.0M. In cash products, there was a decrease in US delta accompanied by increased exposure in Japan. Convertibles showed some signs of recovery in June, as the glut of selling stopped and real money came into the market. The quick snap back caused further buying of convertibles.
- Within rates, Lehman is short JGB (1m/bp), short USD (position tends to change regularly, flat on average), short European rates, and long vol through the CAT markets (hedged through swaption volatility).
- Within FX, Lehman is short USD versus the minor (non-G7) currencies, short the Euro versus the USD, and long the Indian Rupee (fairly minor position). Global vega is up from 5.7M to 7.7M, driven by increases in Australia, and Japan. These were offset by a reduction in the Euro vega exposure.
- Within credit, Lehman went much longer credit (short protection), from 1.4M/bp to 2.3M/bp. This was due to the increased exposure in high grade and emerging markets. They are long the wider spread names in emerging markets, and short the tighter spread names. In terms of credit spread duration, they tend to be neutral. Paul Shotton noted that in the past, when US rates began to climb emerging markets tended to blow out. This has not happened with the current increases, despite some notable political scandals. In regards to corporates, spreads are close to beginning-of-the-year levels, with good corporate balance sheets and no immediate signs of pending major investments by corporations.

L. Bettinger, version 7/25/05

For Follow-Up

- We will follow up with progress of the syndication of the two large European deals in the communications sector.

Lehman Monthly Risk Meeting (package dated 7/29/05, meeting 8/18/05)

Financial Update (Ed Grieb)

- Lehman had another strong month (near record levels)
- Within investment banking, M&A, debt underwriting, and ABS were strong (the ABS issuance was for done on Italian government building leases, \$3.7 billion notional)
- Pipeline remains at near record levels
- Customer flow was off from June, but still high

Credit Risk (Jeff Glibert)

- Current credit exposure was down approximately \$900 million over last month, from \$19.5 to \$18.6 billion. CCE for municipal issuers (who issue floating rate debt that they then swap into fixed) accounted for a little less than half of this decrease. In general, Lehman is a net receiver of fixed and payer of floating.
- The only non-investment grade counterparty, a British counterparty that operates a chain of pubs, has current exposure of \$124 mil (down from \$132 mil last month) and a maximum potential exposure of \$160 mil (down from \$179 last month). Lehman was able to assign 50% of the exposure to another bank, and thus next month this exposure will fall significantly.
- Jeff updated on the latest with hedge funds, which continues to be on their (and our) radar screen.
  - Last month, we discussed that about half of the hedge funds that Lehman tracks were down year-to-date through May. During June and July, this trend turned around and the majority of funds had positive gains. In particular, credit and convert bond funds were up. The gains during these past two months were not enough to turn around the year-to-date numbers for some funds.
  - Hedge funds are seeing two trends. First, some funds have begun to return money to investors in anticipation of shutting down. This is because the managers do not foresee hitting their high-water mark (ie., getting back to their historical best performance level), and thus will not be able to collect incentive fees. Second, top managers continue to generate new funds from investors, leading to an overall net inflow of money into the hedge fund space.
  - The credit picture still appears healthy, as Lehman has not had any problems with hedges in meeting margin calls.
  - Lehman is continuing to get pressure from hedge funds on the haircuts they charge as margin. This is especially an issue with emerging market funds, with pressure coming from European banks who charge lower haircuts.



- Within acquisition financing, the pipeline for new deals remains extremely strong, particularly in Europe. The market has been very receptive to new deals, and most bank deals are oversubscribed. The pipeline is also good for corporate M&A activity. They are anticipating a slight seasonal slowdown into September.
  - Larger transactions are an increasing trend in the marketplace. Lehman is seeing multiple sponsors joining together for Joint Ventures.
  - Another trend in the market is that companies are hiring advisors to investigate funding options on a dual track – IPO registration and LBO value. The company will then go with whichever structure gives a higher value. In general, LBOs have been giving higher values, but they have seen some IPO deals, particularly in the tech sector.
- Global High Yield Loan exposures increased by \$300 million to \$3.3 billion in commitments and by \$400 million to \$1.5 billion funded. Within the communications sector, the amount funded increased from \$257 to \$765 million, driven by the two European telecom acquisition financing deals discussed in last month's writeup. The Greek deal is scheduled to go to market in September, and the French deal is off the books as of now. Within the consumer noncyclical sector, the committed amount increased from \$177 to \$539 million. This represents an acquisition financing for one pharmaceutical distribution company of one of its competitors which closed on 7/28. Lehman is currently in syndication on the deal.

M. Danis, version 8/18/05

#### Market Risk (Paul Shotten)

- Total VaR was down, at \$32.1 million from \$34.5 million. Fixed income VaR declined, at \$28.4 million down from \$32.3 million. Equities VaR usage increased, at \$11 million from \$8.5 million.
- Lehman is still short rates overall. In Asia, there is a curve flattening trade where the desk is long JGB and short swaps (a swap spread widening trade). The curve actually steepened slightly through the month, moving against Lehman. They still maintain a big position in US rates, although the short exposure has been reduced from \$2.5 million to \$1.9 million. At the end of the month, the desk had a small net long Euro position. In the UK, the desk was trying to trade ahead of an anticipated rate cut in the UK, and put on a curve flattener.
- Within FX, the dollar exposure was halved over the month. The desk is now short \$360 million across the board, against various currencies.
- Within equities, the limit for America was reduced (\$16 million to \$15 million), and the limit for Asia was raised (\$7 million to \$8 million). The overall equity limit was unchanged at \$15 million. This was driven by a bullish view of the Asian market, particularly in Japan, and a desire to have the desk increase their risk-taking accordingly. Equity delta increased to over \$1 billion, the bulk of the

increase coming from Japan (plays on the Nikkei by an experienced trader). Gamma also increased, from \$142 million to \$406 million. Delta increased nearly 2.5X within the convertible space, driven by a prop play that intended to profit from increased HF demand after the “dumping” period in May and June. In addition, the implied vol of CBs was 2% cheap to that trading on a single-name OTC basis. Syndicate delta increased as well (\$29 million to \$152 million) due to a large block trade at the end of the month. ½ was syndicated immediately, and the rest was being worked down. Paul Shotton mentioned that this is not really an area well suited to limits, as it is very chunky and tends to be small or extremely large. If you have large limits, they would often never be utilized. However, tight limits get broken every time a block trade gets put on. These deals are subject to a fairly rigorous approval process on a deal-by-deal level at senior levels of the firm.

- Within credit, spreads tightened as the HY rally beginning in late May continued. The desk went longer credit spreads in the high grade space (making money in a tightening event), to approximately \$2.9 million/bp. This was driven by an increase in flow and by EMG, with increased exposure to Argentina. VaR in high grade increased concurrently, to \$8.6 million from \$6.0 million.
- Within mortgage trading, Lehman had a busy month of securitizations, including ARM pools, sub-prime, prime fixed, and hybrid ARMs. The CMO VaR fell by \$2 million due to a decrease in inventory. Non-agency spread exposure increased as well, and the desk has a slightly larger short rate exposure. The macro hedge put on by the business heads has come off, as it was not a particularly successful trade. They had put trades on the 10Y treasury, 10Y swap, and 5Y swap, to hedge against a rate rise at the back end of the curve. However, 10Y rates didn't really rise. The trade had been precipitated by a bearish view of rates at the time, and a belief that a backup of rates might be imminent. The desk heads felt it was an opportune time to put on the trades. The backup didn't occur, and the trade was taken off. It is not common for this type of macro hedge to occur (first in Paul Shotton's time) but it has happened before.
- Eduardo and Paul went over the backtesting results at a divisional and business level. The backtesting process has been in place since April; before, it was done on a bespoke basis. The packet given to OPSRA was backtesting on actual P&L, using the 95% 1-day VaR. Beginning in October, Lehman will move to an automated daily backtesting process, with a rolling 250 day time horizon. They will be using clean P&L (fees and transactions stripped out). For the purposes of discussion with OPSRA, they agreed to also provide us, on an informal basis, the backtesting results against actual P&L so that we can see large transactions when they hit the P&L. One graph of some interest was FX trading, which had a P&L profile that looked more like a prop than a flow business, with a significant amount of down days. Paul stated that in order to play in the market, they had to have some presence, one that was, in a sense, artificially large in that it is greater than would be required strictly by flow orders. In order to attract and retain traders, they must be given a certain amount of discretion, and therefore this businesses has a slightly prop feel.

- We spoke with Paul and Eduardo about including some additional information in the monthly risk packet given to OPSRA. We asked to begin seeing the one-page Firmwide Risk Snapshot that was given us during the CSE review, as this has data on Risk Appetite usage and provides data on businesses which tend to have event rather than market risk.

L. Bettinger, version 8/19/05

#### For Follow-Up

- For the first time, risk management formally brought up their discussion to begin energy trading. While they do not anticipate booking trades in the near future, it appears that this business is moving forward. We will be asking for monthly updates as to the status of the control processes around energy trading, and will begin more in-depth discussion when the energy risk management team is fully in place.

Lehman Monthly Risk Review  
Package dated 8/31/05, meeting held 9/15/05

## QUARTERLY RESULTS

- Lehman had record results. They had a good quarter in real estate led by CMBS deals, with some asset sales. M&A and equity underwriting were close to 2000 levels, and debt origination set a record.
- They took a \$10 million reserve in residential mortgages for Katrina, covering possible covering exposure in the affected states. Lehman has insurance against mortgages **not** having flood insurance.

## MARKET RISK

- Market trends
  - Swap spreads came in a bit tighter, contrary to market expectations
  - Concern about the “squeeze” continues in the Treasury market, with a possible squeeze in September prior to the December contract. There was a drop in open interest, but it was still larger than at the same time in June.
    - Lehman is long futures and short cash, with this position cut in half during August. Futures often trade cheap, and it is the easiest way to hedge the CTD option which can be overpriced (relative to the whole basket).
  - Implied vols continue to be low. With Katrina and uncertainty surround leadership at the Fed, they started to rise somewhat.
    - The rates desk continues to believe that implied vols will rise, and is now long vol (in Europe and in the US)
  - Dollar, sterling, and Euro yields all fell, with curves flattening. There was little change in the JGB (yield up 3bp).
    - Lehman was positioned for a flattening, and was caught by the steepening associated with Katrina (the curve rose 17bp in the 2-10 portion of the curve 2 days after Katrina)
  - Mortgages kept pace with the decline in Treasuries (down 26 bp), and munis lagged slightly, as expected (down 20 bp)
  - Spreads were slightly wider in the credit market, by a few points in HG and 8 bp in HY
  - The auto industry continued to be a source of focus (GM v UAW, GM and Ford sales were lower than expected). Also, the Delphi issue remains on the table.
  - Trading volumes were fairly low, with a pickup expected in September
  - Within equities, the US, Europe, and UK were down. The Nikkei was up 5% on the Kozumi victory. Japan runs the risk of being severely affected by rising energy prices, due to its reliance on imports.
    - Lehman remains bullish on Japan.

- VaR was relatively unchanged this month – down in fixed income (25.4 million versus 28.4 million last month), up in equities (12 million versus 11 million last month). Overall, VaR was down to 30.7 million, from 32.1 million last month.
- Within fixed income, US rates had an increase in VaR due to an increased short exposure (at the time of the meeting, they were now long). They were short \$/yen bonds, but reduced the short Euro position from last month. They were longer Sterling from the prior month (in anticipation of rate cuts). The desk kept on its short in both the Yen and JBB market through a steepener in the short end, which Paul Shotton described as “cost free” as rates can’t fall further.
- Within FX, the desk has been consistently short \$/Yen and \$/others (ringit, peso, NZD). They have also been taking rates positions through the currency markets, mainly through short Euros (due to the uncertainty surrounding the German election), Sterling (expect rates to fall despite high inflation due to the weakening economy), and Kroner (not sure what the story is here). FX implied vol has gone lower over the months – the desk has continually expected levels to rise and keeps buying vol (and losing money).
  - More detail on Europe: the desk reversed its long Euro position to short Euros given an expectation that Merkel and the Christian Democrats would win, which would be good for the markets, but that she would not have a majority and gridlock would result. We will follow up to see how this played out in light of the results (TBD if Merkel will actually get the leadership)
- Within credit, the flow desk reversed its small long position and was slightly short through index positions. It is long names in energy and banking, given a post-Katrina view that banking and energy names were outperforming other sectors. The VaR for High grade credit fell from 10.5 to 5.3. They cut emerging market exposures, which had underperformed, and reduced risk in Russia and Argentina. The desk had a position where they were long risk in the supersenior tranche and long protection in the equity and mezz, and they also cut back on this position. The desk remains long credit (short protection), but has cut back on this position from 2.8M to 2.3M. We can’t see what is driving the halving of VaR by looking at the credit trading detail – will ask Paul about this, and where we would see this reduction.
- Within equities, syndicate VaR came down with the placement of a big block trade. VaR rose substantially in the US volatility business, from 1.5 to 4.3. This was ostensibly driven by an Asian vol position, put on by Ben Fuchs (prop trader, I think). Why didn’t it show up in the Asia vol column, which was relatively unchanged? Was he making vol bets in the US market? Where do his trades get booked? We will follow up next month. The US equity vol businesses looks fairly short gamma, from the stress matrix view, but Paul Shotton said there wasn’t a story here. We’ll keep watching this. A better story for the increase in US volatility would be related to this gamma position, rather than Asia vols.

- We asked last month (August meeting) for a copy of the Firmwide Risk Snapshot, to have a sense of the risk appetite numbers. It was my impression that this was going to be provided this month, but Paul and Jeff said that we needed to speak with Madelyn before they could show us this. We will do this prior to next meeting.

## **CREDIT RISK**

- Credit exposure was relatively unchanged over the month. Overall CCE was flat, ending the month at 18.4 billion. There was an increase in FID, which was offset by a decrease in equity finance related to quarter-end activity. There was no change by industry or geography.
- The deal pipeline remains strong, with a number of syndications teed up. Deal flow out of Europe is higher than at the beginning of the year. There is still strong demand, with a robust market for the paper.
  - Within the Communications sector, one of the European telecoms discussed last month remains on the exposure summary. The deal is currently being pitched through a roadshow, consistent with comments at last month's meeting.
  - There is a new deal within Consumer Noncyclical, an acquisition finance within the distribution business. The deal is set to close in October, with a bond and bank debt offering during September.
  - There is a new deal within "Other Industrial," an Italian industrial. At the time of the meeting, exposure was less than \$100 million (as with all European deals, this was closed first and then syndicated).
- Katrina Assessment
  - Costs estimated around \$20-60 billion, but these numbers are a moving target
  - \$15 billion in commercial flood insurance, resi flood insurance is underwritten by the government
  - Lehman looked at its exposure to top quality insurance names. They expect nothing more major than a 1 notch downgrade (if that)
  - European re-insurers are highly rated
  - The monolines disclosed the numbers, and the insured amounts were within reason
  - In the energy sector, there was exposure to six names with facilities in the affected regions – all had pipelines up and running.
  - In the banking sector, Hypertia cut the price (there may have been a small risk arb position on this deal). The closing for its acquisition by Capital One has been moved to December.
  - In the industrials, cable companies were affected but the region was less than 5% of their business.
  - Lehman had one large transaction with a gas company, where they were committed to a liquidity facility. Some of this was drawn (I think to meet

collateral calls), but this is not considered a material risk. In general, Jeff Glibert thinks that some energy companies may stop hedging (avoiding the collateral call problem in the future, although incurring new risks).

- Hedge Funds
  - No major themes this month, most funds are profitable.
  - Looking towards the September quarter with an expectation of seeing rotation of FoF money, possibly out of credit and CB strategies, towards relative value and emerging markets.
  - No exposure to Bayou. Jeff was surprised that Hennessy got caught out on this one, as they are respected. In retrospect, you can find red flags but that doesn't help now – this case shows the need to be fully collateralized.

#### **ENERGY TRADING**

- No one has been hired yet within credit, but they are in the process of negotiating ISDAS with other dealers' commodities subsidiaries.
- Market risk appears to have hired a head of energy market risk – to be confirmed next month.
- Brian Manson will be running the business, and reporting to the head of rates (Kashuik). Underneath Brian will be three heads: natural gas, power, and oil. Two of those have been hired.
- First trades should be within the flow business, with no physical trades for a year (confirm).
- We will ask for a presentation by risk and the business heads in December.

#### **FOLLOW-UP**

- Risk-taking increased significantly within its US volatility business. We will discuss the positions driving this change during next month's risk review.
- We continue to discuss Lehman's entrance into the energy business, and expect to have an in-depth presentation on their approach to trading and risk management in December.

## Lehman Monthly Risk Review

Package dated 9/30/05, meeting held 10/20/05

### MONTHLY RESULTS

- September revenues were slightly lower than the monthly average for 2005 (1.15 billion as opposed to 1.2 billion), but still higher than last year and the numbers predicted by the budget. Equities were strong (FTSE and Nikkei), with volumes significantly higher.
- Ed Grieb spoke about an unusual funding of a commitment that lowered the cash capital excess in September. Gala, a British gambling company, was to buy another gambling entity, and Lehman was providing the financing. In the meantime, another betting company wanted to sell a subsidiary called Carl (?sp). Gala decided it wanted to acquire Carl as well, and bid for Carl. They came to Lehman and asked to go to the markets with both acquisitions at the same time, so Lehman fully funded the first, planned acquisition and did not syndicate that loan. In the meantime, Gala won the auction for Carl, and Lehman will be syndicating both acquisitions finance packages in one large deal. In addition, in a separate deal, Lehman funded the Teva acquisition due to the timing of that deal.
- S&P upgrade Lehman's rating to an A+. They are the first (upgrade?) in the industry since 2000. They continue to speak with Moody's and Fitch about upgrades.

### CURRENT RISK MANAGEMENT ISSUES

- Refco
  - This was a bad credit to begin with, and Lehman only engaged in short-dated, collateralized trades.
  - Refco dealt with lower tiered accounts (in terms of credit quality), and were very aggressive in extending leverage to hedge funds. Madelyn considered them to be a systemic risk catalyst, in particular in regards to FICC. Margin requirements on the exchange for a broker-dealer are relatively low at 25 million. Refco essentially allowed hedge funds to trade using its name, thereby increasing the risk for all members. Apparently, one hedge fund was trading with up to 100x leverage (EMG, which was half of Refco's matched book). Apparently, EMG is now approaching Merrill (accordingly to Madelyn).
  - Lehman had some FX spot trades with Refco, which they unwound prior to the 15-day moratorium, leaving them with t + 2 settlement risk. They also had cash bond positions (I think sold prior to the moratorium as well) Lehman served notice of a default event and began to unwind some OTC options on emerging market companies prior to the moratorium. They were overcollateralized in regards to these positions by \$15 million, but did not release the excess immediately. In the end, Lehman had \$106 in collateral against claims of \$55 million against Refco, and had released that



excess prior to our monthly meeting. There is one item of note here: prior to close-out, the counterparty must get 4 quotes. Lehman was not able to get 4 independent quotes, and therefore ended up taking a conservative estimate (the mark was at 55 – I believe the two independent quotes were in the high 60s, and one “unofficial” quote was in the 40s). Lehman feels that they should be safe with this decision, in terms of not getting sued by potential creditors. Lehman stated that there was no cross-product netting involved (everything must have been booked in the same entity then) Lehman is aware that some hedge funds have trapped money in Refco, and are monitoring possible knock-on effects. One hedge fund, which buys and sells CDS protection on Argentine debt and overnight EMG repos, has \$438 million trapped but positions were moved and this seemed not to be a huge issue. Lehman has no exposure to Liberty Corner, the hedge fund involved in the off-balance sheet loans to Refco.

- Wood River
  - Wood River approached Lehman about funding some trades. Lehman said no, but agreed to keep the lines of communication open. They decided that cash trades would be acceptable. They bought a sizeable stake (800,000 shares) in an illiquid security from Merrill at the behest of Wood River, to sell to a small regional dealer in Los Angeles. When the time came to do the trade with the small dealer, they rejected the trade. The desk immediately liquidated, but at a loss of \$8 million, as the shares had fallen to \$14 from \$24. We will be following up with Lehman to understand the exact mechanics of this trade, in particular how this might change their approach to settlement risk.
  
- Firmwide Risk Snapshot
  - Per our recent requests, Madelyn walked us through the Firmwide Risk Snapshot as of 9/30/05, which we returned at the end of the meeting, as agreed upon. This is the weekly report that is delivered to the CEO and the Executive Committee. They are also provided with a daily flagging report.
  - Risk Appetite Usage was \$1072 billion. Real estate usage was \$202 million (this is a number to monitor, as it is primarily event risk which we cannot see in the regular monthly package).
  - RA usage has fallen throughout the year, primarily for two reasons. First, risk has fallen within the mortgage businesses. While volume has been increasing, securitization timelines have been shortening, getting the risk out the door in a timely manner. Second, there has been an increasing velocity of the balance sheet, with the riskier positions being turned over quickly (especially in the HY/HG space). There have been more CDS available to hedge the HY and HG businesses, and indices that allow the hedging of more risk.
  - Within the Principal Transaction Group (PTG) in real estate, there has been less equity origination, and more 1<sup>st</sup> lien loans with lower LTV.

Event risk would not necessarily pick up this trend (it focuses on declining market values of the real estate).

- If a hedge fund shows up on the current exposure list, it is probably due to margin call-associated friction.
- The FRS does not show MPE. It does show CE, considered to represent potential “real money out of the door today.” With a deal like Italy, PE numbers would be presented on an ad-hoc basis.
- Intelsat showed up again on the list of leveraged loan deals – this is the second deal, financing the acquisition of PanAmSat.

## MARKET RISK

- VaR was relatively unchanged this month – down in fixed income (23.8 million versus 25.4 million last month), up again in equities (14.2 million versus 12 million last month). Overall, VaR was down to 29.1 million, from 30.7 million last month.
- **Rates:** September saw a steepening yield curve post-Katrina. There was a belief that the rate increases would cease, but then inflation figures led to the belief that the raises would continue, and the market priced back  $4\frac{1}{4}$ . Despite the initial uptick in yields, the curve flattened throughout the rest of the month. Within rates, Lehman was short the dollar, Euro, Yen, and long Sterling. (at the time of the meeting, Lehman was long rates across the board, although in anticipation of rate hikes in Japan, Lehman remained short JGB). Paul Shotton mentioned that in Europe, unlike in the US, the ECB has one goal, of low inflation. Therefore, talk of rate increases continued even in the face of a weak economy. The swaps spread widened, as did mortgage spreads. Vols were initially higher post-Katrina, but gave it back throughout the rest of the month. Lehman halved its short swap spread position (short means positive P&L in widening), and cut back to being essentially flat IR vol after having a short of 11.5 million/1% change in vol last month. Standalone VaR in rates fell significantly (13.3 million to 9.1 million), implying that the vol effect swamped the increase in swap spread DVO1.
- **Credit:** VaR rose within high grade credit, from 7.0 million to 8.7 million. This was driven by increased emerging market exposure, notably to Argentina, Russia, and Venezuela. The actual long credit position (pos P&L in credit tightening) fell slightly, to 2.2 million/bp. The flow desk increased its short positions in the auto and telecom sector, and positioned themselves longer in the finance and insurance sectors. This paid off as the auto sector widened on news of Delphi and GM and Ford’s sales declines. Within the high yield sector, Lehman experienced its 2<sup>nd</sup> worst monthly return as various names lost ground. Supply in general is down this year (71.7 billion YTD versus 98 billion YTD). The correlation markets were driven by expectations about Delphi. The equity and mezz tranches widened, while the senior tranche tightened. Lehman currently has very little exposure to correlation right now. In general, they are longer (must be protection) in the equity and mezz tranches, and benefit from a widening.

- **FX:** The dollar rallied across the board. The Yen weakened, driven by the spike in oil prices (and given that Japan is a huge oil importer). The desk took advantage of this to increase their exposure to Southeast Asia (ringgit, Singapore dollar). The traders believe that the Yen is currently cheap relative to the Euro, and are now long Yen/Euro, and long the Asian high yielding currencies. The traders have been moving in and out of a short dollar position, but are currently still short dollars overall. Vols remain low in F/X, and the desk is long vol, to the tune of 14.2 million/vol point. This seems rather high (although last month it was around 12 million/vol point), and we asked Paul about it. He didn't have an answer, and said that he would get back to us. We'll follow up next month.
- **Equities:** Europe and Japan markets fared well, with the US lagging somewhat throughout the month. The equity delta tends to move around a fair amount, and it picked up early in the month (especially in regards to Nikkei futures and Japanese equities). It went from 860 million last month to 1.8 billion at the end of September, in part due to block trading (a deal was put on at month end). Volumes were strong on the CB desk. The number of IPOs fell, but the pipeline remains strong (but actual activity is down). While implied vols have risen somewhat, vols still remain at low levels. The desk remains long vol across all regions. There has been a reorganization within equities – the division was previously organized along global product lines. There will now be more of a regional focus. We may see a change in the RA numbers reflecting this, but for now there are no changes in our reports.
- **Scenario numbers:** We discussed the submission of scenarios/stress tests, as required under CSE rules. We can expect to receive the first submission in December, and we will reiterate this expectation at next month's meeting.

## CREDIT RISK

- Credit exposure was virtually unchanged over the month. Overall CCE was flat, ending the month at 18.5 billion, from 18.4 billion the month prior.
- Sponsors continue to drive leverage as high as possible, in the 6-7x range. Jeff Glibert mentioned Cox Communications, with 3-4 sponsors. Leverage in this deal is at 7.5x. In general, sponsors tend to prefer 2<sup>nd</sup> liens to bonds, as there is no pre-pay penalty in the case of a quick IPO flip.
  - Within the Communications sector, the Greek Telecom deal was funded, and continues to be syndicated. This is consistent with comments over the past few months.
  - Consumer cyclical is up to \$1,349 billion from \$617 billion. This change is related to the Gala (British chain of bingo parlors) deal referenced at the beginning of this report.
  - Consumer non-cyclical came down with the syndication of the financing of Omnicare's purchase of Neighborcare (prescription service, I think).

- Hedge Funds
  - September was a strong month, with 75% of funds up YTD.
  - Continue to see reallocation of money, with an overall net inflow into the space. Money is flowing out of credit strategies (although some have recovered) and into EMG and merger arb (where spreads are tight, making it not such a great strategy).
  - The biggest concern remains fraud, with the recent headlines stressing the need to be collateralized.

## **ENERGY TRADING**

- Credit will not have a head for energy until next year – given that this is bonus season, it was explained that it is very difficult (or at least very expensive) to hire someone right now, and Lehman would look to hire at the beginning of next year (ostensibly post bonus-payout).
- Current counterparties include IG corporates, a familiar area, and downstream producers (new counterparties to Lehman). There is a large demand for hedging within this space, concentrated in CA, TX, and OK.
- Market risk now has a head of energy market risk.
- The trades with dealers will be out of a new entity, thereby necessitating new masters. The trades with hedge funds should be covered by existing documentation, so there is only a need to amend documents to account for commodities. In some cases, Lehman may be trading with a new fund within an established family.
- Lehman anticipates putting its first trade (financial) in the third or fourth week in November. This has been approved by the NPC. Prior to putting on physical trades next year, the business must return to the NPC for approval. We asked Lehman to notify us (Matt and Lori) when they actually put on the first trade.
- Eduardo is working on the VaR and MPE models, and the market risk head of energy is working with Eduardo on the VaR component.
- The main deterrent to putting on the first trade is documentation – getting all of the documents signed and ready to go is a time-intensive process.
- We are still anticipating a presentation by risk and the business heads in December.

## **FOLLOW-UP**

- Lehman discussed a recent \$8 million loss stemming from a cash trade with the hedge fund Wood River. Lehman had originally expected to facilitate an equity transaction, but not actually assume any exposure. When one of the parties to the transaction refused to confirm the trade, Lehman was left with a large position in a relatively illiquid security that it was forced to liquidate at a substantial loss. We will follow up with the firm to understand if this event has affected its approach towards managing settlement risk.
- Lehman continues to move towards building an energy trading business, having received New Product Committee approval to trade financial contracts. They

anticipate entering the first trade in mid-November, with physical trading to begin later in 2006. We will continue to follow this initiative going forward.

#### **FOLLOW-UP RESULTING FROM P&L DISCUSSION**

- During the quarterly P&L discussion, the capital markets controller mentioned three deals of note that we have not discussed during the monthly meetings. We will be contacting Paul and Jeff to ask if they would walk us through these deals during the next meeting, from a risk rather than a controller's perspective.
  - Puerto Rico: Debt Servicing Deposit Agreement – related to GO debt, related to agencies looking to monetize the periods of the year when they get tax recipes. This is a 30Y deal. This will probably be more interesting from a credit risk perspective.
  - McDonald's Asia block trade: The Fujita family sold their 27% stake of McDonald's Asia to a third party, who then sold them to Lehman at a 33% discount. Lehman in turn syndicated 42% to a hedge fund at a 30% discount, and has 232 million left to work out. This is expected to take a year to accomplish.
  - Diageo/General Mills – Diageo sought to sell 25 million shares of General Mills in a block trade. They had some sort of convertible deal with General Mills, and sold a call to GM while asking Lehman to write a put at the same price. Lehman covered all of its puts faster than expected (in one day). We'll get more information about the actual transaction, what the risk was, etc.

## MONTHLY RESULTS

- November was a bit softer, although net revenues were up 8% over the monthly average for 2005. Within fixed income, there was strong client activity within credit, mortgages were strong but down slightly due to lower OAS. Within equities, there was a \$40 million principal gain resulting from a quarterly revaluation of a private equity investment. Global cash had higher volumes, and increased volatility helped the derivatives business. Investment banking was strong, with record M&A business. The equity origination pipeline is fairly strong, and the debt origination pipeline is down somewhat (to be expected with rising rates and higher spreads). The fee pipeline is at \$900 million, down slightly from the record of \$930 million. Europe and Asia (real estate, NPL) remained strong.

## RISK APPETITE

- Risk Appetite usage is \$1.170 billion, up slightly from \$1.072 billion last month. Usage in fixed income is \$764 million, equities is \$427 million (equity vol is \$261 million – we'll keep our eye on this to see if it increases along with the increase in equity vol VaR), and risk arbitrage is \$181 million. Real estate usage (note that real estate risk does not sure up in the market or credit metrics discussed below) is \$168 million.

## FOLLOW-UP TOPICS FROM LAST MONTH'S MEETING

- Wood River (details confidential due to ongoing litigation)
  - The head of WR, John Wittier, approached Lehman in early summer. He was known to salespeople through his former role as a DLJ fixed income analyst. The only interaction with WR at first was limited cash trading. He also met with PB and credit to discuss a PB relationship, and in late summer provided Lehman with his marketing docs and prospectus. However, he did not provide financials at the time and continued trading on a cash basis.
  - On September 22, he asked Lehman to back-to-back a trade, referencing a small cap telecom stock called Endwave. Lehman was to buy 800K shares from WR's account at ML/UBS, and then sell to their account at Wedbush Securities. WR said that they needed two prices (bid and ask, ostensibly) for accounting reasons. On September 27/28, Lehman bought \$21 million of the stock from ML, and then turned to Wedbush, who did not/refused to recognize the account information, and then refused to accept/pay for the shares. Lehman was now long 800K shares, which they begin to liquidate. The original price was \$24/share, but when they began to liquidate on the 29<sup>th</sup> it fell from 23.65 to 14.27, and volume spiked from 350K to 8m shares. It appeared that everyone else was liquidating this

position as well. Also, it turns out the WR had a controlling position in Endwave and had not filed the appropriate SEC forms.

- Lessons: In hindsight, there were some warning flags, such as the reluctance to provide financial statements. However, this was considered to be a pure trading loss for the cash desk.
  
- McDonald's Block Trade
  - Per our discussion with the controller during the quarterly P&L review, we discussed the McD's block trade.
  - McDonald's Asia equity was owned 50% by McDonald's corporate, 25% free float, and 25% by the Fujita family.
  - In July, the Fujita family decided to sell their stake to an Asian private equity firm called Longhorn at a 37.6% discount. Longhorn turned around and sold the stake to Lehman with a 34% discount. Lehman placed 42% of this stake with a hedge fund at a 30% discount (they stated that this HF is a long-term investor, and therefore unlikely to blow the position out causing Lehman to take a MTM loss), and will take 12-18 months to work out the remaining (58%) position. At the time of the meeting, they had sold down 10% of their position.
  - The actual security is a mandatory convertible bond, where less than 5% converts each month. Longrich is entitled to 10% of any further profits.
  - The position is currently marked at a significant discount. The stock yields 2%, which is high for Japan.
  - Trading in this stock is on an electronic market.
  - The position is being held naked.
  - Marginal VaR is 3 to 3.5 million.
  
- Diageo/General Mills
  - When Diageo sold Pillsbury to General Mills (awhile ago), they got General Mills shares in return. They sold some, and held 20m shares. They wanted to liquidate this position. General Mills issued a convertible bond to protect against dilution, and General Mills bought an out-of-the-money call from Diageo. Diageo bought a put from Lehman at the same strike as the call they sold (which was in the money) to get themselves out of this position. This was done ahead of the restricted period around earnings. Diageo was to exercise at the end of October, either way (which they did). The stock was trading at 47, and the put and call were at 51.5. In the meantime, Lehman placed 20m shares to hedge its delta risk (notional of \$1.27 billion). This was placed in a few days. Lehman was left short gamma, which they hedged by buying the General Mills convertibles (at the same strike price). All 20m shares were placed by the time the options were exercised. Lehman took the shares sold to them by Diageo and delivered into the shorts.
  
- Puerto Rico

- This was a muni-related deal. With a debt service reserve fund, a muni issuer must monthly pay 1/6 of the principal and interest to be held in escrow for the semi-annual payment. Our understanding of the deal is as follows – I will confirm with Jeff Glibert next month. Lehman pays a fixed return on these payments into the fund. Puerto Rico wanted to monetize 30 years of the interest that they would earn through such payments (essentially, a zero coupon bond). Lehman advanced PR \$80 million. Each month, PR will buy securities (\$20 million/month) to pay into an account to cover this – in month 1, the securities will mature in 6 months, in month 2, the securities will mature in 5 months, etc. The CF to Lehman is worth \$120 million, leaving a \$40 million profit.
- 2/3 of the obligation is joint between PR and the development bank of Puerto Rico. 1/3 is only PR (the commonwealth). PR is rated BBB+ and the development bank is rated A. This is a triple tax-exempt issuance (city, state, federal)
- Puerto Rico does not post collateral, although there is a limited credit default market available if necessary. At this point, Lehman is not hedging their exposure.

## MARKET RISK

- VaR was up this month across the board – in fixed income (25.3 million versus 23.8 million last month) and in equities (20.3 million versus 14.2 million last month). Overall, VaR was up to 38.6 million, from 29.1 million last month.
- **Rates:** Rates backed up in the US and Europe (due to Fed expectations, inflation, and oil). At one point, the 10Y breached the 4.5 point but was back to 4.65 at the time of the meeting – a very slight steepening. The 2-10 Y belly of the curve was in danger of an inversion – on the Wednesday prior to our meeting, the spread was only 8 bps. The ECB signaled that it was ready to increase rates at any point to flight inflation, despite an anemic economy. In the UK, rates were fairly volatile, however the selloff was less aggressive than in the US (overall, a weaker economy there). In Japan, bank officials mentioned an April end to the economic easing. The Japanese government thought this premature, and that the BOJ could choke off recent economic growth. In the end, the government (Finance) calls the shots. Rates were only slightly higher in Japan. As for Lehman's positions, they were long (800K/bp) yen rates at the short end. In addition, there was a butterfly curve play, with long JGB futures versus short swaps. They are also long the swap spread basis, believing the short end will stay more or less anchored. In general, as rates rise, issuers want to lock in fixed rates, putting pressure on the long end of the curve. For the US, the desk was long agencies versus short treasuries (via a swap), expecting a widening of this basis – a good carry trade. The rates desk is also long cap vol and short swaptions vol, a position resulting from the Italy trade. Currently, this spread is at historically tight levels. Also in rates, the desk is long futures (5 and 10Y) versus short cash (i.e. they are short the delivery option).



- **Mortgages:** OAS widened by approximately 10bps, and valuations were the cheapest since 2003. Duration increased as well. Overall, there were fewer originations, and the desk (I think this was in reference to the desk, not the market overall) is getting bearish on the mortgages. The desk is net short rate exposure.
- **Credit:** VaR rose within high grade credit, from 8.7 million to 11.0 million. While overall, high grade credit got longer credit, from 2191 to 2806. They did this by reducing their overall short and reducing the emerging market short (now close to flat, 650 to 150). Within HY, there was only \$3.1 billion of issuance (market-wide), the lowest since 2002. To give some perspective, during the previous month there was \$10 billion of issuance.
- **FX:** The dollar gave back prior gains, and the Yen weakened slightly. The desk is long dollar exposure overall, and switched from being long Yen (300) to short (250). The desk kept its short Euro position, but reduced it. The long position in Real, Malaysian ringits, and Singapore dollars was increased. The large FX vol position was reduced somewhat by a client trade (down to 10.2 million from 14.2)
- **Equities:** This was a tough month for the markets. The Nikkei had limited gains, but other markets were down. Volatility increases led to much of the block trade pipeline not being realized. The re-insurers did do a hybrid capital issuance (post-Katrina). The real driver of the VaR increase this month was in equities. Equity actually breached their VaR limit at the end of the month, but this had been pre-approved by Madelyn Antoncic. Paul Shotten seemed very comfortable with this, and mentioned that risk appetite limits for 2006 are currently being calculated and he expects equity limits to increase in accordance with the mandate to grow this business. The increase was led by proprietary risk taking, via index vol positions, in the volatility business. In the US, delta increased by 450 million to \$1 billion (long). While a prop play, housed under the vol line rather than the “prop” line. It was put on by Jerry ?, the head of US equities (the US equivalent of Ben Fuchs). In Asia, Ben Fuchs continued his plays on the Nikkei and Topix futures. Syndicate VaR was up as well, due to a German block trade placed at the end of the month which was not placed immediately due to Deutsche Bank “mischief”- possibly due to their annoyance at being left out of this deal. As for block trades overall, Lehman expects the numbers to increase (previously, most deals were in Europe). Magellan is being shaken up, and will no longer just be a shadow index tracker. They think that other long-only mutual funds will follow, in order to justify their fees, and this will give rise to more block trades as they seek to diversify their holdings.
- **Backtesting Items:** Paul Shotten explained out a \$8 million operational loss in FX Global, resulting from a trader forgetting to reset a forward strike. Apparently, the client forgot as well, and absorbed some of the loss. In addition, equity prop experienced some sustained losses during the first part of October. This resulted from net long positions in the healthcare sector, which lost 3-4% during this period and experienced a significant uptick in volatility.

## **CREDIT RISK**

- Credit exposure was again virtually unchanged over the month. Overall CCE was ended the month at 18.3 billion, down from 18.5 billion the month prior. (this number never seems to change – that may be noteworthy in and of itself).
- There has been a bit more selectivity in the bond and bank loan markets. There is a shortage of BB bank paper, so demand remains strong in this sector.
- Global High Yield
  - The committed amount in Communications rose to \$1.6 billion due to a \$770m deal put on at the end of October, stemming from a Scandinavian broadcast company. At the time of the meeting, the amount was down to less than \$70 million.
  - Within Consumer Cyclical, Gala continued to contribute \$825 million to the committed total of \$1.6 billion in this sector. This deal was to close in 2 weeks. Lehman privately negotiated protection with a hedge fund on this deal. It has been margined up front, and there is variation margin as well. The deal should close in early December.
  - Other deals: Hertz remains in the mandated/committed category, and should close in December. Intelsat's acquisition of PanAmSat should close in 2006, as it is awaiting regulatory approval. Agilent is currently in the market.
- Hedge funds
  - There were some withdrawals from high-yield funds.
  - 85% of funds tracked by Lehman had positive months in September (based on NAV statements, I presume)
  - Long/short strategies were down (0-5%) in October, but they tend to have less leverage so losses were not exacerbated.

## **ENERGY TRADING**

- As of Monday, November 21, Lehman was able to place a trade (only financial, not physical). They are to notify Matt as soon as this happens. Given this timeline, we have agreed to move the presentation back to January.
- Lehman is currently working on 30-40 ISDA masters.

## **FOLLOW-UP**

- Equity VaR continue its recent increase, and actually exceeded its limit at the end of October. Lehman is in the process of recalculating its risk appetite and accompanying limits in conjunction with its annual budget process, and we will continue discussions about the appetite for increased risk taking within the equities space.

## MONTHLY RESULTS

- Fiscal 2005 was a record year for Lehman in terms of revenues, net income and earnings per share. For the month of November, revenues for mortgages were down 10% due to tighter spreads and lower volumes. Equity and derivative activity was up. M&A continued to be strong, with \$700 million in the pipeline (down slightly from \$800 million last month). Equity origination was up year-over-year but down month-over-month. Debt origination in high grade was down due to increasing rates.

## RISK APPETITE

- Risk Appetite usage is \$1.140, down slightly from \$1.170 billion last month.

## MARKET RISK

- VaR was down overall from last month, falling to \$33.2 million from \$38.9. Equities VaR declined from \$20.3 to \$13.9 million, driven by declines in each desk but most significantly by a \$4.5 million decline in Syndicates. Fixed Income VaR rose modestly from \$25.3 to \$28.8 million.
- **Rates:** Yields declined across markets in the U.S., with the 10 year falling to 4.5%. The ECB raised rates for the first time in two years, but the hike is being seen as a one-off rise, not a trend like the US. Japan has not yet increased rates, with government officials and the Bank of Japan in a tug of war over the authority to raise rates. Yield curves continued to flatten with the 2-10 year spread down to 8 bp. The swap spread widened, due mainly to two factors. First, the duration rebalancing needs of mortgage hedgers led them to short swaps, putting upward pressure on swap spreads.<sup>1</sup> Second, there was a dearth of corporate swapping activity due to rate increases (that is, corporate issuers did not do much swapping into fixed, relieving the tightening pressure caused by that activity). Lehman's interest rate exposure remained long, but fell slightly to 800K per bp. Rate volatility rose in the first part of the month, across the curve. Vols at the long end of the curve were at the highest level in the past year. The desk remains long rate vega.
- **Mortgages:** Agencies underperformed in the month, as Fannie and Freddie reduced their portfolios to meet regulatory requirements. Lehman typically is long agencies versus short treasuries/ and short swaps, and they increased their position from 2.6 to 3.8m. Mortgage spreads suffered over the month due to an increase in implied volatility, with mortgage valuations at their widest level in 18 months. VaR in mortgage trading was up due to a technical issue, an updated times series.

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<sup>1</sup> The story is that rising rates extended the duration of mortgages, leaving holders of mortgages more exposed to a rise in rates. To rebalance the duration, they went short swaps (i.e., they want an instrument to increase in value when rates rise).

- **Credit:** The credit index widened over the past month. Calpine, GM, and Ford continued to be active. Sellers of protection for distressed names are now requiring that all the premium be paid up front (in a more normalized situation, the buyer of protection pays running yields). In the CDO book, spreads changed very little, with pricing and issuance levels holding steady. Lehman is short risk equity and long risk in mezz and super senior tranches.
- **FX:** The yen weakened sharply as a result of the conflicting rate guidance coming out of the government, but this stopped after the Fed rate hike and policy statement. Overall, the dollar rallied. Lehman ended the month short the Euro, Yen, and Sterling.
- **Emerging Markets:** EM experienced a sell-off in October, but there was a strong rebound in November. Lehman further reduced their long positions in Argentina, Russia and Turkey (same story last month).
- **High Yield:** The primary supply of HY issuances was \$8.5 billion, compared to \$3 billion in October. LBO and M&A accounted for 40% of the total.
- **Municipals:** Lehman has a structural position of long munis and short treasuries. The desk increased their hedge ratio (proportion of Treasuries that they are short) in expectation of future rate rises.
- **Equities:** November saw strong equity markets globally. Directional risk taking is the main driver of VaR in this space. Delta increased from 800m to 1.2bn in Japan, while the US reduced its delta from 960m to 600m, and Europe reduced its delta from 600m to 300m. The overall long delta position fell 300m to end at 2.1 million. Block trading continues to be important in equity markets, and Lehman reduced its positions resulting from three large block trades (including the German trade referenced in last month's writeup). Traders were also closing out their negative gamma trades in the US in order to protect their P&L. They expect these trades to resume after bonuses have been paid.
- **Backtesting Items:** Global HG trading had a backtesting exception at the end of the month, with a loss of approximately 12m. This was driven by a .5m loss in GM positions, as well as a change to bid/ask reserves (but I don't think this accounted for 11.5 million).
- **Scenario Analysis:** Lehman is implementing their scenario analyses this month. We received descriptions of the ten scenarios they are running, which are modeled after historical episodes (e.g., post-LTCM period, EMG crisis). Each scenario must meet three criteria. First, it must be plausible and economically coherent. Second, it must seek out vulnerabilities in Lehman's positions. Third, it must allow Lehman to drill down into the drivers of large P&L movements. Right now, scenario analysis is playing a limited role in capital allocation and is not being used for limit setting

purposes. The main role for the analysis is to point out areas in which putting on a “disaster hedge” would be appropriate, in order to mitigate very large potential losses. Lehman can run the scenarios daily, but at the moment they are concentrating on month-end runs. Traders are also able to run prepackaged as well as custom-made scenarios from their desktops. Next month we will receive a demonstration of the computer interface for the scenario analysis.

## CREDIT RISK

- Credit exposure was again virtually unchanged over the month. Overall CCE ended the month at \$18.539 billion, up slightly from \$18.254 billion the month prior. We asked about the fact that CCE does not change very much. Jeff indicated that the portion of Lehman’s business that generates CCE, such as derivatives trades with banks and other financial institutions, does not change much in aggregate. Other activity, such as acquisition financing and prime brokerage, varies to a greater extent month to month but does not generate CCE due to collateralization.
- CCE for High Net Worth Individuals declined from \$231 to \$27 million, and CCE for counterparties with an ICR of iBB declined from \$622 to \$314. The majority of this change was due to capturing collateral in the system in the private client business. The collateral was already there, but this month Lehman was able to map the exposures to the collateral and take advantage of netting.
- Global High Yield
  - The committed amount in Communications fell from \$1.6 billion to \$658 million. The Scandinavian broadcast company deal, discussed at the last meeting, was closed and successfully syndicated.
  - Within Consumer Cyclical, the Gala deal remains in the \$1.651 billion committed/\$1.075 billion funded total. In early December the deal was closed.
- The syndication market remains very strong. The Hertz deal was priced on the day of our meeting, and is currently 3-4 times oversubscribed. Another acquisition finance deal, Omnicare, was successfully priced this week. Given the success of the Hertz deal, they expect to see other deals in the same sector popping up in the next few months.
- Hedge Funds
  - There was business as usual for hedge funds in November. The pressure on haircuts continues. Returns have been choppy, but he expects most funds to have positive returns for the year.
  - In the Fund of Funds space, returns were not as good as expected. With the double set of fees that investors into FoFs are subject to, returns must generate a significant amount of alpha in order to make a decent return and they are not seeing this.
  - Within Lehman’s Prime Brokerage business, risk-based margining (i.e., VaR-based margining instead of a simple haircut approach) is ready to go for approximately a dozen clients. Lehman is offering risk-based margining for two main reasons. First, they are doing it to be competitive

with other prime brokers. Second, it is risk-reducing for Lehman to have their PB clients maintain a balanced portfolio at Lehman. That is, by giving clients a break on margin for risk reducing positions, clients have an incentive to bring such positions to Lehman.

- I asked for an update on Lehman's exposure to Italy. For several months the markets had moved such that the position had been in Italy's favor (Lehman owed Italy a significant amount of money). Recently markets have moved the other way and there is a positive CCE, but not enough to be a Top 20 counterparty, and Lehman has purchased some credit default protection.
- Within the past week Lehman completed adding the capability to assign LGDs by facility to their scorecard systems. Previously, the scorecard system had only been able to assign ratings by counterparty. The new system allows credit analysts to assign facility ratings, either one rating for each facility or one rating for all of a counterparty's facilities. The Internal Facility Rating (IFR) is then mapped to a set of pre-determined LGDs. IFRs will be assigned for counterparties in all industries except hedge funds, sovereigns, munis, and private client. For counterparties in these non-covered industries, a flat recovery rate will be assigned (10% for hedge funds, 30% for sovereigns, 60% for munis, and a number not yet assigned for private client). Credit analysts are in the process of populating the IFRs for existing counterparties at this time. IFRs for corporate counterparties are driven by the following factors:
  - External Environment Level Drivers, including jurisdiction
  - Counterparty Level Drivers, including asset evaluation (industry distress, asset profitability, asset protection) and complexity
  - Facility Level Drivers, including seniority and cushion (i.e., how much debt is below the facility being rated)

## **ENERGY TRADING**

- The presentation by the energy business and control functions to the SEC has been tentatively scheduled for January 30. We will submit an outline of topics to be covered in advance of the meeting.
- Lehman is still in the process of setting up the infrastructure to commence trading with outside counterparties. They have engaged in trades (approximately 40 per day across all products, but predominately power and oil) with the exchanges in order to test the connectivity of their systems.
- VaR for the commodity business is currently being calculated on a spreadsheet, but MRM intends to incorporate the VaR into LehmanRisk. Instead of daily historical data dating back 4 years, the VaR calculation uses 15 years of monthly data for the month being calculated. That is, for the Dec. 2005 calculation, data are used for the previous 15 Decembers. This accounts for the seasonality in energy data. No exponential weighting is performed. The standalone VaR for the business currently is at 1-1.5 million, capturing the risk of the exchange trades. The VaR will be aggregated by using the correlation coefficient from the 4 years of overlapping data (approximately 2-3%) and applying the standard sum of squares method.

- Three stress scenarios have been developed for the commodities business: Gulf War, Katrina, and the California Energy Crisis. The largest number so far associated with these scenarios is \$15 million for the CA crisis scenario.
- Credit has approved a wide range of counterparties. Credit analysts from the corporate and hedge fund area have been approving these counterparties until commodity-specific credit analysts are hired. There are several new ISDA docs being negotiated with LBCS as the entity counterparty. Credit is working with several clients who are interested in a combination acquisition finance and hedging program.
- We again reiterated that before any trades with outside counterparties are made, OPSRA should be notified.

#### **FOLLOW-UP**

- Lehman has begun to trade commodities on the exchanges, but has not yet completed a trade with a counterparty. We will be meeting with the relevant business and market personnel at the end of January to discuss the overall energy business.

## MONTHLY RESULTS

- Ed Grieb did not attend the meeting, but Chris \_\_ from the P&L Reporting Group briefed us on the monthly financial numbers. December was a seasonally slow month.
  - Fixed income was down versus the average month in 2005 (\$522 versus \$611). Two product spaces, mortgages and real estate, drove the decline. In mortgages, securitization volume was down, especially in Europe which typically only has 4-6 securitizations per year. Also, the holiday in the U.S. impacted the timing of securitizations. Furthermore, spreads on securitizations were compressed, most notably in the non-prime space where spreads were down roughly 35%. Origination volume was also down in both prime and non-prime products. In real estate, the number of principal transactions was down. Offsetting the declining areas was an increase in the high grade and high yield business, due mainly to tighter spreads and higher customer volume.
  - Equities had a particularly good month, with revenues of \$228 versus a monthly average in 2005 of \$206. The Nikkei was up substantially during December, and business was also good in the U.S. in cash products. Europe, on the other hand, had a not so good month with two block trades in particular performing poorly (Munich Re and Premier).
  - Investment Banking was up significantly versus the monthly average (\$324 versus \$241) due to good origination volumes across the board. Investment Management was up marginally.

## RISK APPETITE

- Overall RA was 1364. Fixed income was at 1030, Equities were at 430. Within fixed income, real estate was at 145.

## MARKET RISK

- Overall firm VaR was up significantly, from \$33.2 million to \$49.7 million. The main driver of this increase was the fixed income division, where VaR was up to \$38.8 million from \$28.8 million. Equities was up slightly, from \$13.9 million to \$17.2 million.
- Within fixed income, the biggest change came from high grade credit, where the desk went from flat to long (this is not reflected in the numbers – we'll follow up next month, in part due to a long emerging markets position (which has existed for some time now). Risk came down within high yield, due to the syndication of the Gala/Coral position.
  - Emerging markets continued their rally, with markets reacting somewhat negatively to Argentina's decision to pay the IMF (this was considered to



be a political rather than economic decision). As mentioned above, the desk was long Argentina, and went longer after the cheapening. The desk covered its Brazil short, a position where they lost money as spreads tightened further.

- The flow trading desk became longer by \$1 million/bp (now at \$4 million/bp), contributing to the increase in HG VaR. There was a significant amount of flow trading around GM and Ford (which trade in the HG desk for historical reasons).
- The CDO book increased its VaR, from \$3.0 to \$4.4 million. They were overall short the CDX index, and increased this short position over the month.
- Muni VaR also increased, from \$2.9 to \$4.6 million as the desk reduced their hedge ratio (of long munis to short Treasuries).
- Energy trading continues on the exchange-traded products, with VaR currently at \$1.2 million (this is essentially diversified away in the overall IR VaR). The desk booked \$3.5 million of profit in December. There was one client trade, which was not communicated to us beforehand. There appeared to have been a miscommunication in regards to notifying us about this, and further requests to learn about a trade prior booking will be communicated in email to Ed, Tony, and Laura, as well as others as appropriate.
- In FX, the dollar weakened across the board. The opportunity to repatriate money to the US is now closed, and the monetary tightening policy is nearer to an end. In addition, there is a greater chance of rates continuing to rise in Europe. The desk was long the dollar versus the majors, and has reduced this position (from \$400 million to \$69 million). In a cross currency position, the desk is long the Yen versus the Euro. The desk remains short the dollar versus local currencies, and in some cases increased their positions (Thai baht, Korean won, Hungarian forint, Polish zloty, etc). In total, this position is at \$700 million.
- In equities, markets finished on a strong note, although US markets were down. In equities, directional risk tends to drive VaR, and it was up slightly (net delta increased from \$2.1 billion to \$2.3 billion). Equities VaR spent much of the month over its limit of \$19 million, which did not cause serious concern as equity VaR limits are expected to increase with the 2006 RA allocations (a process currently underway, and new limits are to be communicated to us next month). Within that net directional exposure change, Asia exposure decreased slightly (by \$300 million), to \$900 million. US exposure increased from \$600 to \$970 million, and Europe increased from \$290 to \$450 million.
  - Syndicate exposure increased on the back of block trades (see discussion below), such as Global Santa Fe.
  - During the turmoil in Japan, the desk reduced its Nikkei positions, but had not experienced any significant losses.
  - There was a re-categorization of the equity categories. The line reading “volatility business” refers to structured vol. Event drive refers to relative value trading, and equity strategies refers to the prop group. Systemic Trading is the quantitative and automated market marking. Volatility flow houses the flow vol business.

- Discussion on Munich Re block trade
  - Lehman participated in a large block trade (over \$900 million) where Munich Re was the underlier.
  - We asked Paul about this trade last month, after hearing from other firms' risk managers that Lehman had taken a very aggressive position on this trade. Paul communicated to us that the trade was going well.
  - During the quarterly P&L meeting, Gerry Riley informed us that the position had currently incurred a \$38 million loss (with \$200 million of shares still to be sold).
  - After this meeting, we emailed Paul to request a discussion of the trade at the upcoming risk meeting.
  - Decisions about block trades are made by the equities risk committee, which is comprised of senior members of the business. If a commitment is very large, it will go to the Commitment Committee as well, and possibly to the Executive Committee.
  - MRM has the role of looking at the trade in relation to RA capacity, determining the volatility of the stock, and the size of the block in regards to trading volume. They also ran RA analysis based on distributing 0, 25, 75, and 100% of the block. In the worst case scenario (0% distribution), standalone (I think, versus incremental) RA would have been \$170 million, ostensibly all in market risk.
  - In this case, the block was 6.9 million shares, or 3% of outstanding.
  - HVB (the selling bank) agreed to a 90 day lockup (they had 4.9% of outstanding shares left), which is a common provision.
  - As of the December 6 close, Munich Re was at 118.20. Lehman underwrote the block at 116.72, and reoffered the shares at discounts ranging from .6% to the full 1.4%.
  - The business distributed 16% on day 1, which was not considered to be a positive outcome. Normally, one would see 50 – 75% distribution on day one. They then hedged 60% of the position, through DAX futures, the purchase of puts, and shorting some Swiss Re (similar type of company).
  - Market risk continued to do periodic analysis, including reporting on what percentage of the daily volume was being turned over. They are working on a post-mortem of the block trade, which we will request to see.
  - We told Paul that this was the sort of loss that we considered worthy of discussion, if not material at a holding company level, and asked that in the future these sorts of losses be addressed proactively during our monthly meetings.

## **CREDIT RISK**

- Overall, Global High Yield loan exposure was down to \$4.3 billion committed/\$2.1 billion funded from \$4.7/\$2.5 last month.
  - Within Consumer Cyclical, the Gala loan for its acquisition of Carl was syndicated, resulting in a fall in commitments from \$1.651 billion to \$930 million. Total funded fell from \$1.075 billion to \$416 million.

- In the Consumer Noncyclical sector, the Omnicare bridge loan came down.
- Exposure in REITs increased substantially from \$70 million committed/\$51 million funded to \$333 million/\$257 million. This was due to a loan made to the Capital Automotive REIT to take it private. This REIT provides financing for auto dealers' real estate (i.e. the actual lots).
- Hedge Funds
  - In 2005, emerging market and dedicated short strategies proved to be the most successful, but there were few funds offering such strategies. Equity long short, event driven, and macro strategies did not do as well, and convertible arb was the biggest loser. Returns were generally good: 80% of funds had positive results in November, and 85% are positive year to date. Fund of funds had more muted returns, but so far no forced deleveraging.
  - Capital inflows were generally into equity, distressed, and market neutral strategies. There were some year end redemptions and some NAV breaches. CRM will be reviewing covenants on these funds.
- Current Credit Exposure declined from \$18.5 billion to \$17.7 billion. The decline was mainly attributable to a drop in fixed income finance with AA-rated bank counterparties.
- The BB-rated swap exposure to a British pub, Enterprise, was sold to a European bank. This was the largest non investment grade exposure Lehman had.
- Lehman recently engaged in the syndication of some commodity swaps, which was a novel risk management tool. Kerr McGee completed a recapitalization with Lehman and JP Morgan. JP Morgan entered into commodity swaps, and subsequently sold the swaps in syndication, meaning that the new buyer of the swap became the counterparty to Kerr McGee and the risk from the original swap was completely novated. This was done with Kerr McGee's consent, and there were ratings conditions as to whom they could transfer the swap. The documentation was clean, and they expect to see more of these types of deals going forward. Our understanding is the Lehman had wanted to provide the commodities hedging on this deal (its first large structured transaction, but lost out to JPM)

#### **OTHER RISK MANAGEMENT ISSUES**

- An error occurred in the LOTC book that caused VaR to be substantially overstated for several months. Tony Stucchio is going to send a written post-mortem on the issue, but basically the story is that an incorrect stress matrix from a front office system was used to value positions for months. At the end of August, a stress matrix error was discovered and the previous day's matrix was used (a hardwire fix). Instead of reverting back to a daily fresh stress matrix, the hardwired matrix was inadvertently used every day until January. Risk management discovered the error after the positions had moved, but the VaR number had not. A notification has been added into the system to signal that hardwired inputs are being used. (Received 1/25 from Paul Shotton)

#### **FOLLOW-UP**

- Lehman has increasingly been involved in large block trades, especially in Europe. We will follow up on the risk management issues of these positions, including a specific block that resulted in a large P&L loss in December.

## **MONTHLY RESULTS**

- January was a record month for revenues, with net revenues equal to \$1.744 billion versus an average month in 2005 of \$1.219 billion. Revenues were up in all divisions – fixed income, equities, investment banking, and investment management.
  - Mortgage revenues were down about 35%. Origination and securitization volumes were down ~25% due to rising rates and tightening spreads. This trend is expected to continue for the next several months with some pick-up in activity in the second half of 2006.
  - Within equities, derivatives trading was strong. Six block trades collectively lost \$40 million, due primarily to Munich Re and Premier.
  - On the investment banking side, Lehman completed a couple of M&A transactions, including Teva.
  - In investment management, AUM was up. Lehman received \$30 million in revenue from incentive fees associated with their two hedge fund investments, GLG and Opsrey.
- Capital was up at LBHI to \$81.852 billion from \$80.679 billion.
- Ed Grieb briefed us on the 2006 Financial Plan which was recently presented to the Management Committee. They are budgeted for 11% revenue growth, to \$16.3 billion, with growth coming from all main businesses and regions.
  - Fixed income is projected to grow by \$500 million. Mortgages and real estate are projected to decline, while high grade, fx, and financing will increase. Energy will modestly contribute, and high yield is flat.
  - Equities are projected to grow by \$500 million. Growth will come across the board.
  - Investment banking is projected to grow by \$400 million, with emphasis on Asia and M&A activity.
  - Investment management is projected to grow by \$300 million.

## **RISK APPETITE**

- Risk Appetite limits for 2006 have not yet been finalized. They anticipate the RA limit will rise to \$2.3 billion from its current level of \$2.1 billion.
- RA usage was \$1281 million. Fixed income was 930, Equities were 359, Investment Management was 250, and GTS (risk arb) was 185. Real estate was 251.

## MARKET RISK.

- Monthly risk changes
  - Global VaR declined to \$37.4 million, from \$49.7 million. Fixed Income VaR declined to \$30.6 million, from \$38.8 million. Equities VaR declined to \$13.7 million, from \$17.2 million. Overall, fixed income's long rate exposure led to a reduced correlation with the long equity delta, increasing the portfolio effect and decreasing firmwide VaR.
  - VaR limits were still unchanged – as mentioned above, RA has not yet been updated for 2006. When that happens, new VaR limits will be set. We again expect that the new VaR limits will be in place by next month's meeting.
  - Rates: Overall, Europe, UK, Japan followed the US as yield rose. This was led by a sentiment change mid-month, with expectations of robust growth and further rate hikes. The UK is the only market with possible rate reductions. In addition, there are expectations of further easing in Japan. The desk increased its overall long positions to 1.1 million/bp. Euro changed from short 800 to long 800, the desk is long the dollar, long Sterling (position cut from 600 to 300), and short the Yen (1.4 million/bp). Liquid market prop reduced its short rate exposure, and increased its long futures v short cash basis trade (now long 9.9m/bp in the 10Y). They also have a sizable position in the 30Y, 3.2m/bp.
    - The big story in rates was the unwind of a portion of the Italy swap. Italy unwound 4 billion Euros of the outstanding 5.5 billion of 30Y swaps, effectively locking in their gains. The original trade was brought about by Italy's desire to hedge against debt issuance, a liability. Essentially, at the time they issued debt at the market rate, they thought that rates would fall in the future. However, the costs associated with reissuance made it unfeasible to call the debt and reissue when this happened. Italy effectively offset its anticipated losses on its liabilities by going long the market. Rates indeed fell, the curve flattened, and Italy had a loss on its liability (probably not MTM, though). Their hedge made money, which they can recognize. Effectively, they have been trading around the liability by using the asset side of the balance sheet. If rates were to rise again, or the curve were to steepen, Italy might re-establish the trade. Effectively, from Lehman's market risk perspective, unwinding the trade is essentially a new transaction. The initial trade has long been hedged and fully integrated into Lehman's overall portfolio, save a long vega exposure which did not present risk concerns, only theta bleed. The unwind gave rise to a new set of risks, and therefore needed to be hedged as a new trade. As this was part of the 30Y portion of the swap, it was the least liquid and riskiest. At the time of the trade, Lehman was left with a large

naked exposure (long rates). To attempt to minimize this, Lehman prehedged the day before by shorting 10Y Bund future (remember, they are acquiring Italy's long rates exposure, so they are shorting rates to hedge). This caused a spike in VaR, to 62 million. This hedge led to curve risk, as they are hedging a 30Y trade with a 10Y. Over a few days, they turned the 10Y short into a 30Y short. Finally, they were left with the basis between bonds (Bund futures) and swaps. This risk, however, was less than the curve risk, which in turn was less than the directional rate risk. To unwind the curve and bond basis at the same time, the desk bought back the 10Y bond to cover its shorts, and entered into swaps to pay fixed (be short) the 30Y – the direct opposite of the trade with Italy, leaving them completely hedging. The final element was the vega, which was embedded into the original trade due to a floor. The unwind created a short 20 million vega exposure, which essentially wiped out the previous long position. Lehman's swap spread exposure did increase significantly over the month from long 289K/bp to 4.6 million/bp as a result of the trade. Lehman realized 112 million profit on this trade, split between i-banking and IRP. This is effectively the price quoted to Italy to unwind the trade (and take on the risk).

- High grade credit ended the month close to flat, with emerging markets continuing to tighten, and defying expectations. With the movement from long to flat, VaR declined by 2.7 million. In high yield, spreads tightened in all sectors except healthcare. There was 13.7 billion of HY bond issuance, one of the highest levels in 2 years.
- In FX, the dollar weakened across the board. The desk increased its long dollar against Euro, Yen, and Pound, from 70 million to 250. It increased its long local versus dollar position from 694 to 936 (i.e. short dollar versus local). This includes Brazil, China, Mexico, Turkey, and Malaysia. F/X took its vega down slightly as well.
- Equities were strong across the board throughout the month, led by energy stocks. In Japan, Livedoor had a knock on effect, but overall Japanese markets were strong despite this event. Lehman had no major exposure to Livedoor, but did have some exposure to Japanese tech stocks dragged down by Livedoor. There was a problem with a block trade in Pioneed, where negative research came out after the block was purchased. From a block of 10m shares, Lehman still has 7m shares. VaR rose in the cash products line, due to a transfer of some positions (Alltell, Parker Drilling, UCBH) from the syndicate to cash desk. There is no hard rule about when a position is transferred. In addition, all block positions do not necessarily flow through syndicate – if the block comes due to a relationship with the cash desk, it will show up in cash. We might want to follow-up on the difference between these two desks – it was very unclear as to how the block trades were handled (with respect to the two desks). The volatility business reduced its long delta position in Asia by half, leading to a

- Paul Shotton walked us through his write-up of the LOTC VaR error. This was mentioned in last month's write-up. Essentially, a stress matrix within equities derivatives was hardwired into the VaR calculation, resulting in stale data being used from August 2005 through January 2006. The error was caught when positions were moved between legal entities, and were being carefully scrutinized. This problem was limited in scope, as all positions booked before 8/23 were getting the stale results, but all positions booked after 8/23 were treated correctly. Had this problem not been picked up proactively, it eventually would have become less significant as the old positions expired or rolled off. As a result of this, if an accurate stress matrix is not received, LehmanRisk will only use the prior day's results for one day. After that, the calculation will automatically revert to a Taylor Series approximation. When SNM is eventually folded into the Euclid system, the potential for this sort of failure will go away (however, this is a long-term technology initiative)
- Ram Challa walked us through the market risk metrics for the commodities business, which had been discussed briefly during the energy overview day. On a daily basis, Ram produces a breakdown of risks by VaR and by greeks, and presents this information both in terms of dollars and contracts (which the traders generally prefer). He also prepares summary comments on significant oil, natural gas, and power positions, as well as providing market graphs that complement any larger positions (for example, the support an oil vega position, he had a graph of WTI crude Oil Front Future implied vol). He also shows the results of the three stress tests: Gulf War, CA Power Crisis, and Katrina. The Gulf War is an outright 40% shock to the price of oil, while the CA power crisis is currently applied on a more selected basis. Effectively, qualitative decisions inform the qualitative shocks – for example, Ram determines how correlated particular markets. In the future, however, there will be a more qualitative approach, with correlations calculated rather than assumed. Katrina stresses the refining portion of the oil world. Ram's analysis is given to the head of energy trading on a daily basis, along with more detailed positional information. Ram stated that there are plans to provide the business with some risk-weighted information – for example if the business is long 1000 contracts in the front end, and short 1000 contracts in the 11 month contracts, that should not net out to 0 as volatility in the front end is much higher. Some information may be presented in month-equivalents to get around this issue.

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- P&L backtesting: Controllers have begun to produce clean (minus fees and commission) backtesting for some business lines, such as cash equities. Some reserves have been stripped as well. There are still issues around fees and commissions, such as in the mortgage business – i.e. when do you recognize securitization fees? As for the new equity breakdown in VaR, there will not be backfilled P&L for these new categories (the totals won't have changed). The businesses will show backtesting results going forward once there is enough data. Paul stated that as a rule, controllers have been told that risk and P&L need to flow through the systems together. This process is not perfect yet, however. The revenue from the unwind of the Italy swap was not fully attributed to IRP, which bore all the risk (this is likely because for internal accounting purposes, the revenue was split between IRP and i-banking). Liquid markets prop had two exceptions over the month, resulting from futures basis positions – these tend to get hit first when the market sells off. There was an exception in global equities, related to the Livedoor market sell-off. As mentioned above, cash equities now has commissions stripped out (3-4 million/day on average during 2005), and as expected, there are more exceptions. Some were again caused by the selloff in Japan – 10 tech positions lost a combined 6.2 million in one day. Other exceptions were caused by a few block trades in Europe. Paul mentioned that due to the increase in block trades, and given the number of exceptions caused by block trades, market risk is looking at applying some sort of liquidity adjustment to VaR to account for these chunky trades. We will follow up on this.
- Paul provided us with the stress test reports. We hope to begin receiving the executive summary (1-2 pages) that were requested at next month's meeting

#### **CREDIT RISK**

- Current exposure increased to \$18.103 billion from \$17.668 billion last month, driven mainly by increases in equity financings.
- Global High Yield commitments rose \$0.2 to \$4.5 billion while funding remained at \$2.1 billion.
  - In Basic industry, commitments rose to \$444 million due to funding committed for the Georgia Pacific acquisition of Koch Industries.
  - Commitments in Consumer Cyclical fell to \$771 from \$930 million due to the continued syndication of the Gala deal.
  - In Electric, commitments rose to \$592 from \$456 due to Mirant financing.
  - Commitments in REITS fell to \$299 from \$333. The Capital Automotive position discussed last month is down, but a new deal, Suncal (private transactions for a modular home REIT) popped up this month.
  - A \$122 million commitment to purchase NPLs in Turkey was funded in January. These are middle market corporate loans, similar to NPLs purchased elsewhere by Lehman recently, with a securitization exit strategy.

- We asked to be walked through LBHI's 15 Largest Current Exposures by Counterparty report that is included in Lehman's monthly CSE filing. In coming months we have asked to be briefed on changes to the list.
  - Included in the report are several mortgage warehouse facilities (Option One, Long Beach, Capital One, and Aames). The report only includes cash and treasury collateral, and not mortgage collateral. Thus, these counterparties show large exposures, but in reality the exposure is secured with mortgage collateral. [Should the report be amended to include mortgage collateral?]
  - Teva Pharmaceuticals is on the list with a \$1.425 billion commitment. That amount was funded for a short period of time during the month but it has since been refinanced.
  - Intelsat (Zeus Holdings) is on the list with a \$1.331 billion commitment to finance their purchase of PanAm Sat. They expect to close the deal in June, pending regulatory approval.
  - General Electric is on the list with a \$1.175 billion commitment consisting of a Firm Relationship Loan. Normally Lehman would syndicate such a loan, but GE is such a large credit there is no demand in the market for a syndicated loan. They do have credit default protection purchased on the exposure.
  - Telefonica is on the list with a \$836 million commitment, which is a 1 billion sterling Firm Relationship Loan, part of \$18 billion facilities for the acquisition of O2.
  - Dunkin' Brands is on the list with a \$825 billion commitment which was financing of the buyout of Dunkin Donuts. Lehman had 34.5% of the total deal with JPM. Originally the commitment included the typical mix of bank loans and bonds, but Lehman pitched a novel structure to securitize the franchise receivables which the client has agreed to. The securitization will take place in the spring, and has been rated BBB.
  - Acquico is on the list with a \$598 million commitment. This is a German real estate company, and Lehman provided mezz financing for the purchase of a portfolio of privatized properties.
  - Hertz is on the list with a \$537 million commitment. This is an asset-backed piece of the LBO financing against the fleets of cars. Lehman is currently selling these out.
  - The Options Clearing Corp is on the list with a \$1.1 billion exposure. This is a gross exposure, and the net number would be much less, but for legal reasons they do not report the net number. [What was the story here again?]
  - JP Morgan (\$656 million net exposure) and State Street (\$594 million net exposure) are also on the list. This is from overcollateralized financing activity on securities borrowed.

- We asked about the many hedge funds with large positive current exposure on LBI's credit-concentration report. These are all funds for whom Lehman does MBS clearing, and the CEs do not reflect netting and clearing deposits. If these deposits were included, the CE would go down to zero. Again, Lehman does not have positive CE with hedge funds, except for call period risk (that is, the period of time during which market moves create positive exposure, and Lehman is waiting for the receipt of collateral that it has required).
- The remaining swaps with Italy have moved back into Lehman's favor, generating current exposure of \$432 million and MPE of \$3.8 billion. This is Lehman's largest current credit exposure. Had the \$4 billion of swaps not been unwound by Italy this month, the exposure would have been much greater.
- About a half-dozen ISDAs were recently signed with counterparties to the energy business. Another dozen are closer to being signed. Given this development, trading activity should increase. The credit department is working on setting limits for these counterparties.
- On the leveraged lending side, January was below average in terms of the number of new deals. They expect the pipeline to pick up in the coming months.

#### **FOLLOW UP**

- The head of credit risk retired effective February 17, leaving the position vacant. We will follow up with the Chief Risk Officer about staffing plans.
- The energy group is growing, with two key developments recently. First, the signature of ISDA documents with several counterparties during the past month will allow for more trading activity. Second, the group intends to go to the New Product Committee in the next few weeks to seek permission to trade physical power and natural gas products in addition to the financial products they are currently allowed to trade. We will continue to closely monitor developments with this group.

## MONTHLY RESULTS

- February was another strong month.
  - Fixed income (\$777 revenue versus \$611 average month 2005) was strong due to securitizations in Europe and real estate transactions. Equities (\$293 versus \$206 average month) was up globally.
    - The Pioneer block trade posted a \$43m loss, and Lehman is still long stock with a market value of approximately \$70m. The explanation is that negative sector news came out after the block was purchased. For comparison, the Munich Re block trade lost \$33m. The Pioneer loss will be recorded in LBI.
  - Banking had an ok month (\$208 revenue versus \$241 avg month), driven by Texas Genco advisory fees. Investment Management had a good month (\$198 versus \$161 avg month) driven by private equity gains on Lehman's real estate funds.
- Lehman released quarterly results the day after our meeting. Again, there were record results on a quarterly basis due to a good market environment. Lehman is advising AT&T on their BellSouth merger, and are #2 in the M&A announced pipeline; therefore, they expect the good results to continue.
  - Mortgages were below expectations. Originations were down 20% versus 4Q05. Spreads compressed further, especially in the subprime space where they are at 6-7bp. The securitization volume is in line with last quarter's volumes. Lehman has seen originators cutting their headcounts, and cutting coupons as well (probably in an attempt to squeeze out smaller competitors). Lehman is actively buying pools of whole loans, since it is sometimes cheaper than originating themselves at this point. Some pockets of mortgages are still attractive (option ARMs) and they remain active in these areas. The pickup in the second half of 2006 that they are forecasting is due to a forecast of an improving rates environment.
- Capital was up at LBHI to \$83.450 billion from \$81.852 billion.

## RISK APPETITE

- Risk Appetite limits for 2006 were approved by the board on December 1 but the allocation among businesses was just completed with Madelyn and Dave Goldfarb last week. The RA limit rose to \$2.3 billion from its current level of \$2.1 billion.
- RA usage was \$1289 million. Fixed income was \$1031 million, Equities were \$305 million, Investment Management was \$249 million, and GTS (risk arb) was \$211 million. Real estate was \$287 million.

## MARKET RISK.

- Firmwide VaR rose to \$41.8 million, from \$37.4 million. FID VaR rose to \$32.2 million from \$27.3 million, while Equities VaR was virtually unchanged at \$14.3 million. The new VaR limits were not yet on the report, but we expect to see them next month (we've heard this for a few months, but Madelyn indicated that they have been set at the division level and are being negotiated down through the businesses).
- 10Y treasuries came in 20bp. At the beginning of the month, the front end went up, and there was a 10bp inversion between 2s and 10s. In March, the curve went basically flat, at 4.74 (all coming out of the back end). The market has essentially priced in an increase in the fed funds rate to 5% in May. On the rate volatility side, levels are at lows not seen since 1998. There was some increase in vols recently, but no significant uptick. The mortgage market followed treasuries fairly closely, with no serious signs of convexity hedging evident. Within liquid market prop the desk increased its exposure on the dollar side, leading to a \$1.7 million VaR increase. Within mortgage trading, VaR was down \$1.9 million due to less spread exposure and a reduced short position.
- Credit markets remained fairly benign, with the notable exception of the auto industry. GM widened by 175 bp, GMAC by 62 bp, Ford by 75bp, and FMC by 35 bp. Since February, GMAC has come in by 85bp. High grade credit got longer Argentina and Turkey, a main driver of the \$2.9 million increase in VaR.
- Within FX, Fitch put Iceland on a negative outlook and the currency dropped 9% in one day. Sympathy widening in Brazil and Turkey followed. FX VaR increased by \$4.0 million, due to a change in the Yen position from short \$162 million to long \$450 million (standalone VaR on this position was \$4.4 million).
- In equities, the US finished the month basically flat, and Eurostoxx was up slightly. The Nikkei was down 2.7%. Block trading continues, with Lehman experiencing at \$40 million + loss from their Pioneer position, which is not yet fully worked out (50-60 million remains). Lehman mentioned that the block pipeline was strong at \$5 billion, a number determined by the sales desk based on chatter they hear in the market (i.e. this number is not as tangible as the leveraged lending pipeline number). Syndicate VaR was \$2.3 million higher at the end of the month, due to a Jones Apparel block trade that was off at the time of the meeting. Systemic trading increased its VaR by \$1.9 million due to a basket trade that is being unwound slowly.
- Energy trading remains light, with VaR continuing to hover in the \$1.5 – 2 million range. There is one OTC transaction on the table that Lehman has proposed to a client, which would probably generate a spike of around \$10 million, and would be worked out over a few days. It is very uncertain though as to whether this trade will materialize.

- Backtesting exceptions
  - Global FX had an exception due to the Iceland downgrade and subsequent correlated moves in other currencies (losses were approximately \$6 million)
  - Equities cash had an exception resulting from the Pioneer block trade, referenced above. There was a 3 standard deviation move in the oil services sector. Other drivers of the exception were an 8% fall in the SPX and a position in UAL which fell on the same day (loss around \$12 million).
  - Equities strategies (prop) had an exception due to the SPX being down and the movement of 2 stocks (one of which fell 14%). Also, the Eurostoxx moved beyond the 95% confidence level (loss was less than \$6 billion)
- We did not go over scenarios as they weren't ready yet, because this meeting was earlier in the month than usual (not sure why they wouldn't be ready by the 14<sup>th</sup>).
- When Paul Shotton returns from vacation, we are going to discuss the risk packet and a way to make it more relevant to our discussion. This will probably involve moving towards more screenshots from LehmanLive.

## CREDIT RISK

- Current exposure increased to \$19.321 from \$18.103 billion last month. The CCE included on the Firmwide Risk Snapshot is approximately \$30bn and includes money lines.
- Leveraged lending has slowed during the past few months, with \$23 billion in the pipeline now. Pre-holiday, the pace kept up, but now they are seeing a slowdown. Markets are still receptive to new deals, but there is not a lot of supply. Many of the deals that are out there are stretched in terms of leverage.
  - Madelyn spoke about the VNU deal.<sup>1</sup> Lehman had several concerns about this deal and did not seek to participate. First, the large number of sponsors (7) is a concern because if things go poorly when the deal goes to market it is unclear who will step up. Second, there were concerns about the company's business model, in that they were not sure about the future

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<sup>1</sup> From *Bank Loan Report*, 3/13/06, "If the buyout receives approval, Deutsche Bank, Citigroup, JPMorgan, ABN Amro and ING will be leading the debt financing package to back Dutch company VNU NV's 7.5 billion (\$8.9 billion) acquisition by a private equity consortium, according to a source. VNU, a Netherlands-based information and media company that owns Nielsen Media Research, accepted a buyout offer from AlpInvest Partners, The Blackstone Group, The Carlyle Group, Hellman & Friedman, Kohlberg Kravis Roberts & Co. and Thomas H. Lee Partners last Wednesday. If the buyout is permitted, Deutsche Bank will be left lead on the bond portion of the deal's debt package and Citigroup will be left lead on the bank loan deal, the source said. A spokesman for the private equity consortium declined comment."

prospects of Nielsen Media. Third, there is currently no CEO and all the sponsors will need to agree on a new one.

- Doral Bank is a counterparty with some structured repos that issued a restatement of its earnings in February. Doral is a Puerto Rican mortgage bank that had some valuation problems related to its IOs. Lehman has restructured its transactions with Doral and they currently have excess collateral in place.
- Global High Yield commitments rose \$0.2 to \$4.7 billion while funding rose \$0.3 to \$2.4 billion.
  - Commitments in REITs fell to \$517 from \$299, with \$376 funded. There has been increased activity in this area, with take-private deals. The basic story here is that many of the REITs do not like being public because of increased regulatory burdens such as SOX, and the market is favorable to the deals.
- Some personnel news:
  - There is an offer out to a senior credit person to cover the energy business, analogous to Ram Challa's position on the market risk side. Steve Simonte has been shepherding the process to get ISDAs signed with energy counterparties.
  - Patrick McGarry, who covers commitments, is now a direct report to Madelyn with Jeff Glibert's departure. He has also been made a permanent member of the firmwide Commitment Committee.
- Lehman has seen an extension to the lock-ups required by hedge funds recently. The motivation for this appears to be a desire to get out of registering with the SEC, which exempts funds with lock-ups greater than two years from registering. From a risk management perspective, this is good for the fund's liquidity.
- There was not much change in LBHI's 15 Largest Current Exposures by Counterparty report included in Lehman's monthly CSE filing. The biggest change is that the mortgage warehouse facilities were removed after netting mortgage collateral.
- The pipeline of deals by bucket is as follows:
  - Conditional deals: \$10,541 million
  - Contingent: \$1,878
  - Mandated, committed letter: \$4,407
  - Mandated, final docs: \$6,118
- Madelyn discussed several deals that she had highlighted to senior management in her weekly meeting with them.
  - A new commitment with Del Monte for \$700 million, given a 90% probability, for its acquisition of Meow Mix.

- Bonds were priced for Serena Software, a \$190 million exposure with a 95% deal probability. Lehman is projected to retain a \$10 million revolver piece.
- Swiss Re is a \$3.2 billion facility composed of equity and hybrid securities, essentially a backstop bridge, and Lehman expects to get 20-25% of the facility. Lehman puts a deal probability of 33% on participating.
- Knight Ridder was on the list with a \$1.049 billion facility with an expected deal probability of 33%. Since the briefing, the sponsor Lehman was backing lost the deal.
- Activant is a \$244 deal with a probability of 33%. This will be either an IPO or an M&A.
- General William Lynn is a \$275 million facility with a deal probability of 50%. This is a homebuilding company and the financing is to buy back 90% of the stock to go private. The financing is collateralized by stock and by property.

## **ENERGY**

- Lehman has engaged in a few more OTC trades, but again, these appear to be fairly small. They are still on track to switch trading systems (to Kinetix) in early April, and plan to go to the NPC in mid-April to request permission to trade physicals. As mentioned above, VaR is holding steady, although there is one potentially large trade on the horizon. We spoke with Madelyn about the firm's credit risk appetite in this space, and she indicated that in lieu of obtaining its usual thresholds (which are not going to happen in the energy space, by market convention), traders would have to deal with counterparties that can be hedged on a single-name basis, and therefore be names that trade actively. We will continue to monitor this, as it would seem that this policy would act as a constraint on the business and one would expect some pushback.

## **FOLLOW UP**

- Leveraged lending has slowed during the past few months, and many of the existing deals have high levels of imbedded leverage, creating potentially riskier situations. The chief risk officer indicated that Lehman has expressed hesitation to get involved with the more highly levered deals. We will continue to monitor Lehman's risk appetite in this space.



## **MONTHLY RESULTS**

- Ed Grieb discussed March monthly results with us at the quarterly finance meeting on 4/11. March was another strong month.
  - Fixed income (\$698 revenue versus \$611 average month 2005) was below the monthly budget figure due to a dropoff in real estate and in the credit derivatives business. Equities (\$421 versus \$206 average month) was very strong driven by active equity markets and the profitable volatility business in Asia.
  - Banking had a solid month (\$220 revenue versus \$241 avg month), driven strong results in M&A offsetting a downturn in debt origination.
- Capital was steady at LBHI at approximately \$87 billion.

## **RISK APPETITE**

- RA usage was up to \$1373 from \$1289 million. Fixed income usage was down to \$866 from \$1031 million, while Equities usage was up to \$570 from \$305 million. Investment Management (\$262 million), GTS (risk arb) (\$255 million), and Real estate (\$284 million) did not significantly change.

## **MARKET RISK.**

- Firmwide VaR fell slightly, from 41.8 million to 39.9 million. Despite the relatively small overall change, Fixed Income fell significantly (32.2 million to 23.5 million) while Equities rose (14.3 million to 24.1 million).
- With respect to limits, they have been updated at the Firmwide and Divisonal Level. Firmwide has gone from 55 to 60 million, FID has gone from 50 to 55, and equities has gone from 19 to 22. While Paul stated that business level limits in equities have been changed, the new limits were not yet reflected in our packet. Paul said that due to a slight VaR re-organization in FID, limits have not yet been set at the business level.
  - Due to recent organizational changes, FID has decided to allocate limits across “pods” as well as at the business level. There will now be four areas reporting to Mike Gelban, head of FID. Kashiuk will run IR Products, liquid market prop, FX, and energy. VaR will be calculated at the pod as well as business levels (as for limits, Paul is working on determining historical correlations, as they do not have data series for this particular combination of businesses). Alex Kirk will be responsible for all credit businesses – high grade, CDO, and high yield – this is another pod (Rick Reider, the former head of high grade, is on a sabbatical and when he returns he will be starting up a prop trading group, to be discussed further in a few months. This is

outside of GTS, the prop group formerly known as Risk Arbitrage). Real Estate and Munis will remain independent, and the heads will continue to report directly to Gelban. Firm financing, the repo desk run by John Coughlan, reports jointly to FID and John Wickham, the head of GCS (prime brokerage).

- Within fixed income, there was a rise in yields across the globe, as well as a global steepening of yield curves. In Japan, there was the long-awaited announcement about the end of quantitative easing, although there appear to be no immediate plans to increase short term rates. Lehman thinks the move will be more likely to be 10bp than 25 bp (which, while used in the US, is not a magic interval that has to be used in all countries). As a result of these yield increases, market players began to unwind the carry trades, and some of the hot money left the emerging markets space. (Again Iceland was mentioned as a major example of what happens when hot money gets spooked, as happened after the downgrade). There was a good deal of volatility around Fed expectations, which led to an upward move in realized volatility that was not really matched in implied. Lehman increased their long vega position, primarily in IR products Europe. They had been left very short vega after the Italy trade was unwound, but have replaced all of the volatility and then some. Overall, the firm is long 37 million/vol point, with 19 million of that coming from Europe.
  - The VaR changes were driven primarily by four areas: **liquid markets prop, high grade, FX, and FID corp.**
    - The VaR in **liquid markets prop** fell from 10 million to 6.5. The short swap spread was halved, from 1.7 million to 900k/bp. Previously, the desk had a short vega position (6.6 million/vol point), which is now long (2.4 million/vol point). They had been outright short 500k/bp, and flipped to long 300k/bp. The 10Y futures basis play was cut as well, from 7 to 5 million/bp.
    - In **HG credit**, spreads widened in EMG and the back of the Treasury sell-off. There was both a flight to quality as US rates rose as well as idiosyncratic effects (Brazil finance minister, Turkey central bank spat, Ukraine elections). The VaR fell by 1.7 million to 10.5 million, with the long credit spread position fall from 3.5 million/bp to 2.6 million/bp, mainly due to a reducing in EMG positions (reduced long in Mexico and Argentina, increased the short in Brazil, increased the short in Russia). In addition, the there was a loan position held in Tokyo, an Indian fertilizer company Cribco. The positions was originally 215 million, and is now down to 60. Standalone EMG VaR fell by 2.2 million to 4.4 and on an aggregate basis is contributing 4 million of the 10 million HG VaR.
      - The HY market tightened throughout the month, and tended to trade more in line with the equity markets rather than with Treasuries. Autos, airlines, and building companies tightened. Much of the news around GM/GMAC was already priced into the spreads, such as the sale of GMAC. GM ended 200 bp tighter, and GMAC

- was 86 bp tighter. Ford widened slightly. Within GTS (prop), the desk is very long exposure in both GM and GMAC. The flow desks tend to change their exposure to both day by day, depending on customer demand. At times, however, exposure to GM is fairly high at a firmwide level (see RA numbers).
- Within **FX**, the commodity-backed currencies saw some softening (Australia, New Zealand) on the back of the unwind of the carry trade. The desk was long these currencies, and closed out the positions over the month. G10 exposure is now small, and the desk has retained some long local exposure but reduced it overall (not sure why commodities currencies would have suffered, since market doing well...maybe follow up next month). The desk ended long \$670 million overall against the dollar, and is still long vega, although much less than before (4.6 million to 1.3 million). No individual major currency has a position with a delta greater than 100 million, and VaR fell from 7 to 3 million.
  - **FID Corp**, a repository for legacy positions, has been housing the Formula One workout position that has been on the books for a long time. This was sold to CBC partners, and VaR fell from 2.5 million to zero.
  - Within mortgages, the desk was higher spread risk (OAS risk increased by 2.4 million to 7.1 million). The desk reduced its outright short, and the business is holding up well despite rising rates and a weakening housing market. VaR was relatively unchanged (14 million versus 13 million last month)
  - The equities markets had a mildly positive performance over the month, with Asia outperforming Europe and the US. The main driver of the spike in equity VaR was an increased long delta position, from 1.9 billion to 3 billion (1.4 of which came from Japan). The desk had its limit increased to 25 million for a two week period. There was some initial resistance to this change, as the year's limit increase had just gone through, and there was reluctance to immediately increase the limit – business heads (?as opposed to risk mgmt) wanted the traders to live within their limits. But the traders insisted that there were good opportunities, and in the end the limit was increased temporarily. The limit was first breached on March 28, and then on April 3 the desk agreed to apply for a temporary increase (so the increase was essentially ex-post). The main driver of the spike was the continued bullish conviction in Asia.
    - Equity risk was up across all regions. Long gamma positions increased in the US and Asia, while decreasing in Europe. Block trading was fairly light, but the desk still holds a residual Pioneer Drilling position. However, this stock has begun to rally and the desk has made of some of last month's loss. The desk did buy a large position in Kerzner International from Fidelity, a 200 million position that is now down to 100 million.

- VaR increased in Asia Volatility from 5.9 to 12.9, driven by Ben Fuchs, the proprietary trader. We will continue to monitor these positions, which tend to be one of the more significant contributions to equities VaR overall.
- Energy VaR saw an uptick at the end of the month, ending at \$4 million. Average VaR throughout the month was \$2.5 million. Markets showed seasonal volatility, and the desk was long oil volatility by the end of the month. In power, most positions continue to be spread, playing PJM west against other locations. This is contributing most of the desk's profit, which continues to be fairly small. In natural gas, there are a few options positions, and some outright shorts. Lehman has hired two, more senior natural gas traders who will have higher limits. They are expected to join (begin trading?) in early to mid May.
- Backtesting exceptions
  - Global trading strategies had an except on the day that GM reported a big loss – their GMAC position was down \$9 million (out of a total one-day loss of \$11 million)
  - Equity strategies had an exception resulting from an \$8 million position in Charles Vogler, a name that fell 16% in one day.
  - Equity/Event driven had two exceptions, one from a M&A bet on Mittal Steel where the desk lost 400k (they were short Mittal, the acquirer), and the other resulting from a client facilitation trade in VNU, which lost 500k on this day.
  - Equity/Systematic trading had an exception resulting from a 1.4 million loss on a blind risk basket.
- Scenario Analysis
  - Paul discussed a few goals with respect to the scenarios: generate them more frequently (than monthly run), add scenarios, and let desks customize their own scenarios. They already have 11 scenarios, so one might wonder how many they can add without creating too much noise. We'll continue discussions about how the scenarios are being used internally.
  - A new scenario, Black Monday, was added. This compresses the 1987 equity crash into a shorter period, to capture more aggressive losses in Asia. During the crash, Asian markets followed the US but rallied by the end of the two-week period captured in the Equity Crash Scenario. Given Lehman's recent trend of being long the Nikkei, they wanted to make sure that Asia was not being treated too leniently. This scenario doesn't hit the US as hard – markets are only down 20%. Incidentally, this 20% may be more accurate than the 1987 numbers because of circuit-breakers and other market changes.
  - The worst case loss was 1.2 billion, in the equity crash. The second worse loss was 1.1 billion, in Black Monday. Third was a lostt of

## CREDIT RISK

- Some personnel news:
  - David Oman, formerly the regional head of credit risk in London, was promoted to global head of credit risk, focusing on counterparty exposures. The titles are a bit unclear, but he is co-head with Patrick McGarry who is focusing on commitments, in that they both are direct reports to Madelyn. We asked for an updated org chart. Both David and Patrick attended the meeting, and they will jointly brief us going forward.
  - The offer to the senior credit person to cover the energy business was accepted and this person will be starting in the next few months.
- We noticed some discrepancies between the “LBHI’s 15 Largest Current Exposures by Counterparty” report included in Lehman’s monthly CSE filing and the “Top 20 Counterparties ranked by CCE” report included in our monthly risk package. David Oman and Laura Vecchio are going to write something up explaining the different methodologies used to compute the two reports and we will either discuss it on a conference call or discuss it at the next meeting.
- Commitments are up at Lehman, and the markets are doing well due to tremendous demand. As David put it, there is a surge of liquidity into the market. Syndication is going very well, with deals typically 3-4x oversubscribed. Pricing flex is down, meaning that issuances are being priced down after coming to market due to strong fundamentals.
- The pipeline of deals by bucket is as follows:

Bucket	3/31/2006	2/28/2006
Conditional deals	8,512	10,541
Contingent	603	1,878
Mandated, committed letter	10,268	4,407
Mandated, final docs	7,127	6,118

- The largest deal in the Mandated, final docs bucket is a \$1.384 billion exposure to Mines de la Lucette. This is a real estate deal secured by office buildings in Europe, primarily in Paris and the exposure should be down by next month after syndication. Generally, the deals in this bucket are real estate deals that stay on the list longer before securitization takes place. Patrick feels that the risk of these deals is relatively low because they are covered with low LTV ratios. He feels the preceding bucket, Mandated, committed letter, is more risky as these are LBO type deals.

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- Following up on several deals that Madelyn discussed last month:
  - A commitment with Del Monte, given a 90% probability, for its acquisition of Meow Mix, was lowered from \$700 million to \$571 million, but continues well.
  - The bonds for Serena Software was closed, and the deal was oversubscribed. Lehman retained a revolver in the ballpark of \$10 million for relationship reasons.
  - Lehman lost the \$3.2 billion Swiss Re facility.
  - Knight Ridder was on the list with a \$1.049 billion facility with an expected deal probability of 33%. Since the briefing, the sponsor Lehman was backing lost the deal.
  - The Activant IPO deal is in syndication (\$166 million commitment, 90% prob).
- The aggregate CCE number remained virtually unmoved at \$18.3 billion. This number rarely moves. For NIG counterparties such as hedge funds and emerging markets, Lehman has a strict collateral policy which does not generate current exposure.
- Within the hedge fund space, the downward pressure on haircuts continues. When a decrease in margin comes from a decrease in aggregate risk (from utilizing portfolio-based margining), that's ok, but Lehman resists when the funds have less liquid products.
  - David reports seeing some funds punished for providing monthly liquidity. In essence, these funds are providing investors with more liquidity than a CD. Consequently, he has seen some funds pushing out the redemption period.
- Within IG counterparties, there were no concerns to report.
- The firmwide risk snapshot is now showing a scenario loss metric associated with emerging markets exposure. The inclusion of this metric was not in response to an increased interest from senior management, rather Paul Shotton suggested putting it on the snapshot since they had been calculating it but not reporting it on this report previously. The metric, the Estimated Loss Potential (ELP), estimates the loss that Lehman might experience in the event of an instantaneous crisis in a country. It incorporates both market risk and credit risk, and looks at the worst 2-week move in the country's history. There is debate internally about what to include as an Emerging Market country (e.g., whether to include Iceland, Hong Kong, and Poland), but the ELP is computed for all non-G10 countries. Limits are set by country and by product.
  - ELPs reported include:

Country	ELP
Korea	245

Turkey	206
Russia	73
Hungary	59
Ukraine	54

- The ELP for Russia is closely monitored due to legacy concerns resulting from the '98 event and Lehman's reported liquidity problems after the Russian default. As the ELP approaches its limit, the businesses dynamically hedge using either corporate or sovereign CDS.
- Jami Miscik is Lehman's global head of sovereign risk management. She is actively involved in country ratings. Lehman is expanding in the Gulf area, and she was actively involved in performing due diligence. Given that emerging markets are an area of increasing risk, we will follow up with a presentation of her activities.
- We spoke a bit about the Italy exposure, which has a CE of \$1.3 billion and a MPE of \$9.5 billion. The aggregate exposure to Italy, including sovereigns, corporates, and real estate, is monitored closely. David said he gets a weekly update on the large trades which are being dynamic hedging.

## **ENERGY**

During the April 11, 2006 P&L review, Laura Vecchio gave us an update on energy physical trading.

- Energy went to the NPC on April 10 and got approval to begin physical trading in power and natural gas. Approval is subject to the successful move to the Kinetix platform – the business plans to go live on May 1 or May 3 (according to an update provided by Laura at the 4/20 risk meeting). The conditions will be tracked by the Internal Control Committee Oversight & Governance (ICCOG), Laura's new committee.
- The business currently has no plans to store product, and will only rent or lease transmission or transportation capabilities
- The risks in this area are primarily operational. Lehman has moved to hire a power scheduler.
- The impediment continues to be getting ISDAs signed – currently, there are only 10 in place.

## **FOLLOW UP**

- Lehman's energy group has now received internal approval to begin physical commodities trading, and will begin trading physical power and gas as soon as their migration to a new technology platform is complete. We will continue to discuss the controls in place around this new area of business.

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- A Global Head of Sovereign Risk Management was appointed last year. As Lehman is increasingly active in emerging markets and expands into areas such as the Gulf, Korea, and India, we plan to meet with her to understand how she views and monitors this risk.



## **MONTHLY RESULTS**

- Ed Grieb has taken a new position within the asset management division. Ron Geraghty will take over his role with respect to holding company supervision. Kristine Smith, who has some responsibility for financial reporting and accounting policies, also attended the meeting.
- Compared to the records set in previous months, April was a slow month.
  - Fixed income revenue was down to \$645 from \$698 last month. Mortgage origination continues to decline (down 30% this year), and customer flow credit product trading was down. Equities was down to \$261 from a very strong month last month.
  - Banking was down (\$195 revenue versus \$241 avg month) due to declines in debt origination. Fixed income origination was down, as most companies had prefunded due to rates uncertainty. M&A remained strong, and Lehman participated in the Lincoln-Jefferson Pilot and Wachovia-Golden West mergers.
  - Investment management was strong due to private equity gains and real estate sales.
- Capital was up slightly at LBHI to approximately \$92 billion. Cash capital excess was \$2,210, which is Lehman's target number. During April Lehman issued \$10 billion in debt.

## **GENERAL**

- The OTS review of Lehman's thrift has started. They may reach out to us as the consolidated supervisor.
- Scott Burton, the head of risk technology within CRM, has resigned, but Madelyn hopes to persuade him to stay.

## **RISK APPETITE**

- RA usage was down to \$1204 from \$1373 million. Fixed income usage was steady at \$863 million, while Equities usage was down to \$456 from \$570 million. Investment Management (\$261 million) and GTS (risk arb) (\$256 million) did not significantly change. Real estate was up to \$320 from \$284 million.

## **MARKET RISK.**

- Global VaR usage fell by \$10 million to \$30 million. This was driven primarily by equities, which went from \$24.1 million to \$15.1 million. Fixed income VaR was relatively unchanged at \$23.7 million.
  - Next month the VaR limits and usage should be reorganized into “pods,” better reflecting how the businesses are organized (as discussed last month)
- Fixed Income
  - Rates market color: The G7 meeting in Europe generated minimal initial buzz, but statements about fixing trade deficits led to a huge dollar sell-off. In addition, Fed comments about a possible pause in interest rate hikes led to market confusion about pricing in increases. The ECB remained vigilant about keeping inflation in check, and the combination of higher expected rates in Europe as well as a possible end to rate hikes in the US also contributed to the weakening of the dollar. Within the business, IRP increased VaR by about \$3 million, driven by a doubling of the swap spread widener in the US and Europe as well as an increase in vega (from \$37 million/vol point to \$57 million). This increase was driven by a belief that when mortgage options are deep out of the money, there is less need for mortgage traders to hedge, resulting in low implied vol. The desk believes that this will change at some point, and that it is a good strategy to pick up vol while it’s cheap. Mortgage trading saw its VaR fall by \$2.5 million, due to a fall in the short rate exposure, as well as decrease in credit spread exposure to \$6.5 million. Real estate had a \$1.5 million reduction in VaR, also due to a fall in short rate exposure. High yield fell by \$1 million, with the desk slightly longer in Argentina and reducing their Brazil short. VaR increased by \$2 million in FX, as the net short USD position nearly doubled, from \$660 million to \$1.1 billion. There was small exposure to emerging markets, and the long vega FX positions flipped to be slightly short.
- Equities
  - Equity market color: Realized vol increased slightly, but was still at historical low levels. As mentioned above, equity VaR was the driver of the firmwide decrease. Overall delta fell from \$3.2 billion to \$2.3 billion, with almost half of that decline coming from Asia. The rest was of the decrease was from the US (Europe actually had a slight increase). There are now no global limits at the business levels – the regional business limits remain. This is because no one is managing equities on a global business, except Pat Whalen (head of equities trading, reports to Bart McDade, who is the head of equities division). Apparently, Pat must not want global limits to monitor. The story wasn’t entirely clear, but we have heard mentioned before that equities are now being run on a very regionalized basis. However, if all of the desks begin to get very long delta in cash products, and this number starts to creep up, one would

- Energy
  - Energy VaR was up to \$5 million (from \$4 million last month). There are a few power market spreads, as well as WTI/Brent spread plays. There are some small shorts in power and gas, as well as a small long oil and long oil vol position.
- Scenario Analysis
  - Paul discussed one new scenario, an oil supply shock. This scenario would currently lead to a loss of \$964 million (fourth-worst), primarily due to equity and FID positions (again noting that energy risk is still very low). In addition, he is focused on credit spreads. Lehman is working on recasting their shocks to credit spreads. Currently, shocks are relative (20% widening) with no minimum threshold, which can lead to very small shocks at the AA & above level. They are going to take absolute shock levels from 1992 and convert them into relative shocks, and then apply those relative shocks (more like 50% widening) across the spectrum (I think, not just to AA and above. Will confirm next month).
  - Currently, the worst case loss is attributed to the Equity Crash Scenario, which would result in a loss of \$1.8 billion. The second worst-case loss is from the Black Monday scenario, leading to a loss of \$1 billion. Third-case is Parallel move down, which leads to a loss of \$1 billion as well.
- Backtesting exceptions
  - Equity strategies again had a couple of exceptions. This portfolio tends to have a fat tail, and market risk is considering how to look at VaR in this area (one possibility is a move to 99.7% confidence from 95%, which would capture more). The losses were caused by a number of long positions that did not perform relative to the shorts.
  - Event driven had three exceptions, resulting from idiosyncratic moves in M&A positions. VaR in the business looks like it has been more or less flat over the past 4 months, a topic discussed during the meeting. Paul noted that this business is subject to an event risk charge, as VaR does not pick up deal break risk.
- Model validation
  - Eduardo stated the QRM has begun saving testing documentation from the model reviews, and is attaching it as a distinct document – an overlay to the developer’s document. We will be taking a look at some examples during the July monthly meeting.

## CREDIT RISK

- The pipeline of deals by bucket is as follows:

Bucket	4/28/2006	3/31/2006	2/28/2006
Conditional deals	7,539	8,512	10,541
Contingent	1,231	603	1,878
Mandated, committed letter	12,672	10,268	4,407
Mandated, final docs	9,149	7,127	6,118

- Madelyn discussed that the deal flow has softened a bit. (*Most clearly seen in the declining trend of conditional deals.*) They are seeing mostly commitments in the real estate space, meaning loans collateralized with real estate that end up getting securitized. Leveraged lending, on the other hand, is down.
- The credit environment remains benign. Europe just recorded its 14<sup>th</sup> month without a corporate default.
- There were no problems in the hedge fund space. Emerging market funds recorded the best returns during April.
- At the end of April, the Austrian bank Bawag ran into some problems stemming from its role in the Refco bankruptcy. Lehman has little exposure to this bank.
- The Italy current exposure increased from \$1.3 to \$1.8 billion due to a backup in rates, while MPE fell from \$9.5 to \$6.0 billion. Lehman continues to dynamically hedge this position for both market and credit risk. The European view is that Italy is “too big to fail” and Lehman continues to monitor the situation closely.
- Puerto Rico has had a political problem during the past two months resulting from its budget deficit. The government recently sent 100,000 municipal workers home without pay, but the issue was resolved a week ago. They are on watch to downgrade, but would still be investment grade. Exposure remains about the same at \$100 million. Jami Masick was involved in monitoring this situation, and we are scheduled to meet with her next month.
- The FSA is planning an AIRB visit in August. The focus will be on probability of default and loss given default models.
- We asked about Lehman’s participation in the Amgen convertible bond offering with the call spread overlay that we had heard about at other firms. Lehman participated in the convert offering but not the call spread overlay. They sold out of the original deal and kept some secondary trading positions because they liked the credit.
- Aggregate current exposure was up to \$25.6 from \$22.1 billion due to larger volumes, especially and increase in the stock borrow/lend business in Europe. The growth was in higher rated counterparties.

## ENERGY

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- Documentation is in place for 17 counterparties. The first level of counterparties were large dealers with whom Lehman already had a relationship. Now, they are seeing more merchant energy counterparties. Credit takes comfort in the fact that these are right way trades, but the exposure is chunky. For example, these counterparties are looking to hedge production, which introduces an operational risk component. A senior credit analyst from Morgan Stanley will be joining the team. We will continue to monitor this closely.
- Market risk has hired someone for the Europe business.
- On April 10, the NPC approved physical trading for the US (Asia and Europe are going through similar approvals with their regional NPCs). They are targeting the end of June for approval for physical trading in Europe. Europe is also looking to go their NPC on June 2 or 9 to get approval for metals trading. Asia is also looking to trade physical oil (it's worth noting that Lehman had indicated they wanted to stay out of the physical oil space until everything else was up and running and robust. Looks like that's not the case anymore).
- The desk has fully switched over to Kinetix, and the parallel run has been completed.

#### **FOLLOW UP**

- New milestones in energy trading this month include the conversion to a more robust trading system and the first physical power trade. Legal documentation has been established with more counterparties, including merchant energy companies who are lower rated than typical Lehman counterparties. Credit risk management has hired a senior analyst to cover these counterparties, and we will continue to monitor their exposures and risk management surrounding them.

## **MONTHLY RESULTS**

- Net revenues were \$1,591 million, which was the second highest month after 01/06. Fixed income set a record with revenue of \$857 million, led by mortgages (origination levels are still down, but they received better spreads on securitizations, and Europe continues to do well), CDOs, and rates. Equities also did well, with revenue of \$196 million. Investment banking had a good month, across the board (M&A, equity and debt origination), and investment management realized \$25 million in private equity gains.
- Ron Gerahty and Paul Shotton stated that Lehman had taken off significant risk prior to the market events of May, and didn't have any severe P&L events.

## **MEETING WITH HEAD OF SOVEREIGN RISK**

- We met with Jami Masciek, the Head of Sovereign Risk, as well as Madelyn Antoncic about topics on their radar screen in this area. Jami has an advisory role on political and economic topics related to non-G10 countries. She consults with risk management and the business areas on topical issues. In response to inquiries from risk management or the business, Jami will either provide written memos or brief orally.
- An area of focus is large emerging market exposures. Jami just received an inquiry from the business about the Mexican election, and for her views on the possible ramifications of the outcome. She is actively monitoring Russia, India and China. Turkey is on her watchlist because of the deteriorating political situation. Lehman has a small counterparty exposure to Brazil, and the firm is averse to increasing its exposure because of the risk. Jami works with credit risk management on this area.
- Madelyn briefed us on Lehman's plans for expansion in the Gulf. They are planning on opening branches in Dubai and Qatar, both of which will be minimally staffed. This is not a large strategic initiative to change Lehman's risk profile, as they plan to sell U.S. originated products, perform advisory work, and do asset management. Clients will include monetary authorities and private wealth clients. Risk factors specific to the region include the regulatory and legal environment and money laundering. To deal with the former, Lehman assures that transactions take place under international law, not Islamic law. To deal with the latter, they ensure the doctrine of "know your customer." Lehman has worked with external consultants for assistance in setting up the business, and has established a Gulf Advisory Committee to help navigate the process, utilizing a former UK diplomat with knowledge of the area.

- In Asia, Lehman has exposure to Thailand through their NPL portfolio (non performing loans). They also have exposure to Korea through NPLs and the Korean exchange.
- Madelyn spoke about the India initiative. Currently there are 1,000 Lehman employees in Mumbai performing a variety of functions. For example, the equity derivatives desk in London has some quants in India to assist with structuring the transactions. The time difference allows for quicker execution of the transaction, since the Indian quants can work on the transaction after the London team has gone home for the night. Within Risk Management, they have 15 employees in India performing model validation (*more from Eduardo on 7/13*) and counterparty credit reviews for certain low-risk counterparties such as big European banks. There are plans for more employees from the capital markets and banking divisions, and we will continue to monitor this growth.

### RISK APPETITE

- RA usage was up slightly to \$1270 from \$1204 million. Fixed income usage was up to \$993 million, while Equities usage was down to \$343 million. Investment Management (\$295 million) and GTS (risk arb) (\$225 million) did not significantly change. Real estate was up slightly to \$334 million.

### MARKET RISK

- Firmwide VaR was up slightly in May, at \$33.4 million (versus \$29.9 million in April). This was driven by an increase in Fixed Income VaR, to \$26.4 million, which was offset by a \$5 million decrease in equity VaR, to \$10.1 million.
- Fixed Income: the yield curve rose, with the market pricing in expectations of a 25 bp rate hike. There was a modified flight to quality, with some unusual patterns – usually, the markets would see a bull steeping after a Greenspan move, expecting markets to become immediately flooded with liquidity, but this time there was a bull flattening of the curve, implying that rate increases are on the rise (damaging asset prices). Paul is thinking of creating a new scenario with flight to quality and a bull flattening, as this is a new combination.
  - Rates: Increase in short Yen rates exposure (\$2.1 million/bp short). The overall short is at \$1.5 million/bp (dollar short 600K, Euro short 100K – numbers don't line up with packet, maybe new? Packet says US short 188k, Europe long 769K, Asia short 2.1 million). The desk expects the Japanese curve to steepen, and has some outright steepeners on as well (government bonds versus swaps, 15Y JGB floaters with the float based on the 10Y). There was also an increase in long rates vega, up to \$63 million/vol point. This is primarily being driven by the Europe rates desk, which is now long \$42 million/bp. Europe still believes that vol is cheap – the vol positions are mostly swaptions and caps. Liquid market prop had a backtesting exception resulting from a long EM (stocks and currencies)

- versus short Treasury position (we should ask about how much cross-asset trading this group does).
- FX: FX increase its long vega positions, which is now at \$9 million/vol point ( packet says 6.8 million/vol point). This position is expressed mainly through the CHF and JPY. The desk continues to believe that the yuan will strengthen, but since that is difficult to express directly, the desk uses the Malaysian ringgit as a proxy, as well as the JPY (which has sufficient liquidity). FX had a backtesting exception resulting from sell offs in the ringit, Thai dollar, and Korean won.
  - Credit: Credit exposure remained low, with high grade running short in the HV01 CDX index. The desk also put on a short position with credit spreads lagged the equity sell-off (i.e. didn't blow out in sympathy).
  - Energy: VaR was virtually unchanged at \$4.3 million, down slightly from \$5.0 million last month. Usage was spread evenly across power, nat gas, and oil. Power plays tended to be mostly spread positions, with overall longs in the east-midwest and shorts in the NE and CA. Nat Gas was short in 2006 and 2007, and oil run a \$3.5 million crude vega position, as well as spreads and outright positions.
- Equities: Market sold off, in part due to uncertainty around interest rates/Bernanke comments. Commodities and emerging market-related stocks bore the brunt of the fall. All regions decreased their long delta exposures – US was down to \$400 million, Europe at \$700 million, and Asia down to \$500 million. In addition, the Americas desk appeared to have taken off its long gamma position, as the theta sensitivity was now short \$2.4 million (versus being relatively flat last month) (not sure I understand exactly how to interpret this theta number, worth asking next month).
    - Equities did have three division-level exceptions in May, on the 15,16, and 23. Causes were the restricted NYSE position (5/15), a 2% sell-off in the Nikkei (5/16). Cash products had exceptions as well (from both the NYSE and Nikkei positions), as did flow volatility, which had gone shorter vol and lost \$10 million at the end of the month. The four proprietary equity desks (**portfolio, equity strategies, event driven, and systemic trading**) all had exceptions as well. We discussed the difference between these desks, and the final answer seems to be that they are not neatly delineated and there is a good deal of crossover. **Portfolio** is supposed to take long/short positions, baskets versus future, and basket versus baskets. They tend not to have outright directional positions, as they engage mostly in arbitrage. They suffered some decent sized losses (\$15 million) that were a result of non co-terminous pricing between the cash (closes at 4:00) and future (closes at 4:15) markets. However, these losses are usually mitigated by a gain the next day, as prices even out (they made back the loss the day immediately following the \$15 million loss).**Equities strategies** is also an arbitrage group, which is prone to fat tails (the ratio from 95% to 99% confidence levels is 2, when it should be 1.4). This group has 15 traders, and the biggest position is around \$3



million. Risk tends to be very linear. The desk lost a good deal of money on momentum trades, where the desk goes long stocks that have already fallen, while goes short that have not yet been hit by the market downturn (with the expectation that they too will fall). This trade did not work out well for them. **Event driven** focuses on risk arbitrage, among other strategies. **Systematic trading** tends to have quantitative arbitrage strategies, like blind baskets. This desk also had the non co-terminous pricing issue, which caused some VaR exceptions (although this desk frequently has exceptions). There are about 1500 names in this portfolio, and about 10% do not have full time series data.

- There were eight block trades this month, and all were distributed the first day without problems.
- Global Trading Strategies
  - GTS had a number of exceptions this month (6) due to losses on large, concentrated positions (e.g. India-related stocks, Imperial Sugar). P&L volatility appears to have picked up in this group in the last few months, but VaR is relatively unchanged – in fact, VaR has changed very little over the last year. We’ll continue to watch this group.
- Scenario Analysis
  - As was the case in April, the worst case loss was the equity crash scenario, coming in at \$910 million. The majority of losses come from the Volatility books, with Asia as the main contributor (in line with what we’ve heard over the past months, i.e. Ben Fuchs). The second worst loss is \$638 million, arising from Black Monday – same main drivers as equity crash. The third worst-case is the HY and leveraged buyout scenario, where losses are \$424 (interestingly, equities takes almost half of th loss, followed by GTS and then IM)

**CREDIT RISK**

- The pipeline of deals by bucket is as follows:

Bucket	5/31/06	4/28/2006	3/31/2006	2/28/2006
Conditional deals	8,915	7,539	8,512	10,541
Contingent	1,473	1,231	603	1,878
Mandated, committed letter	13,628	12,672	10,268	4,407
Mandated, final docs	8,393	9,149	7,127	6,118

- Patrick McGarry reported that the pipeline remains robust, and markets continue to be very liquid and deals have been well received. He confirmed the “covenant lite” environment, where companies are attempting to get rid of financial covenants such as the definition of default, interest coverage clauses, or senior

debt coverage, in order to gain more operating flexibility. Patrick indicated that Lehman is not opposed to saying no to deals with too few covenants, and that having the ability to pre-market a deal further reduces Lehman's risk.

- The Intelsat deal was expected to close by the end of June, and syndication was underway.<sup>1</sup>
- As indicated last month, most of the deals in the Mandated – Final Docs bucket are real estate deals with a CMBS takeout projected within 3-6 months. Nothing new to report with the specific deals in that bucket.
- Within the Mandated – Commitment Letter, the E.On deal with a \$1.719bn expected amount is expected to close by the end of the year. This is financing in support of E.On's acquisition of Endesa.
- Dunkin' Donuts has now been moved to the closed deal bucket with a final hold level of \$52m. The deal, which utilized asset-backed debt similar to the Hertz deal, was priced in early June. Lehman expects to see more of these types of deals in the future, especially in Europe.
  - Instead of issuing high yield debt, the LBO firms packaged franchise fees into asset-backed debt. They could then issue the debt with higher ratings and save millions on interest payments.
- A new FRL (firm relationship loan) was issued to GMAC for operating purposes. The total facility is \$2.75b and the new commitment was \$150m.
- Lehman has hired a new credit analyst for the energy business from Morgan Stanley, Peter Galbreith. After his garden leave, Peter is now working on validating Lehman's processes. Lehman has also hired Janice Hart from Morgan for credit reporting. She will report into David, and will assist in beefing up their credit risk reporting. As they develop new reports, we will utilize them in our monthly meetings.
- The FSA is scheduled to visit in August as part of its AIRB application.
- Current exposure was virtually unchanged at \$27.2b. The Top 20 counterparties were mostly the usual ones.
  - Republic of Italy was #1 with a CE of \$1.9b and an MPE of \$5.8b.
  - "Imser Securitisa Gia ISP III" (Telecom Italia) was #20 with a CE of \$156m. They are holding the real estate of Telecom Italia as collateral, but are not giving credit for it in order to be conservative.
- The top sub-IG exposures include:
  - Lehman Brothers Real Estate Partners, which is an external fund, has a CE of \$39m.

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<sup>1</sup> Press reports on 6/19 indicate that Intelsat reduced the size of their offering by \$600m "in a reflection of waning investor demand for high-yield, high-risk debt." [Bloomberg News] We will follow up on developments in this market.

- Windmill is a hedge fund with a CE of \$19m, who is also a prime brokerage client. The CE comes from FX transactions hedging Japanese equities in their pb account. Windmill wants to collateralize these transactions with their excess pb balances. The legality of doing this is being worked out by the attorneys. From a risk management perspective, Lehman will assure that a sufficient amount of free dollars remain in the pb account to cover margin.
- Timber Hill (CE \$13m) and Ameritrade (CE \$11m) have exposure from open equity finance with Lehman. Extencicare (CE \$12m) has exposure from fixed income swaps.
- The top ELP came from Mexico (\$209m). These are local currency positions with a strategy designed to arbitrage the uncertainty in the market from the July election. Other emerging market exposure comes from Argentina (ELP \$65m) long offshore debt, Israel (\$56m) bonds and CDS, Russia (\$37m) offshore assets, Paris Club debt, and Gazprom corporate bonds, and Ukraine (\$14m) long sovereign positions. Lehman is short Brazil and Venezuela from basket positions.
- Hedge funds were up 13% on average in April, and overall up 7.8% through April. 92% of the funds that Lehman tracks are positive. Credit is having lots of one-off conversations with various funds, but nothing systemic to report. Emerging market funds have given back their ytd gains, and they expect many to be down double digits in May. Lehman does not have a big emerging markets PB business, so they do not see any signs that their clients are in trouble. He has not heard of any big liquidations or redemptions. The margin call process has been orderly, with the same volume of calls but the calls tend to be bigger.

#### **FOLLOW UP**

- Lehman's risk from its commitments in the pipeline is primarily mitigated by their ability to sell off the commitments in the syndication market. There is some indication that markets may not be as receptive to lower rated bonds, which could lead to higher hold positions for Lehman. At the same time, the deals themselves may be becoming more risky, as there is a trend towards covenant-lite, where financial covenants such as the definition of default, interest coverage clauses, or senior debt coverage are not included in deals in order for firms to gain more operating flexibility. We will monitor the composition of Lehman's pipeline of commitments and the syndication process.

### **MONTHLY RESULTS/OTHER BUSINESS**

- Net revenues were down 10% from May to \$1,429, but still above the average month '05. Fixed income revenues were down to \$763, on strong real estate asset liquidations in Asia and CMBS results. Securitizations were \$13bn (versus \$11bn average in '05) with \$5bn of originations. Equities were up to \$255 on strong flow and trading strategies. Investment Banking was down 5% to \$230. M&A, equity origination, and debt underwriting all declined. The pipeline is at a record \$930m, but in July some deals were pulled off the table.
- European revenues were at \$400m, up 50% over average month '05, on strong mortgage results, especially the sale of subprime mortgage residuals, where a market is developing. Asian revenues were \$230m, driven mainly by a real estate asset monetization. FID Asia had revenue of \$170, \$100-120 of which was contributed by this deal, a 20% mezzanine investment in Shua real estate made in May 2005.
- LBIH's cash capital excess was down significantly to \$1.98bn, due to some long term debt becoming due within a year at the end of the June. More debt was issued and the excess cash capital now stands at \$5bn.
- Lehman anticipates paying a dividend before the end of the 3Q. They plan to keep excess capital above \$4bn. Lehman has discussed this with the NYSE, and will keep us informed as plans proceed.
- As mentioned previously, Lehman plans to migrate the Brady bonds business to LOTC. These are US counterparties, and are in the process of reviewing documentation.
- Lehman is considering moving the Hong Kong and Singapore entities to a holding company in Asia. This would be done because of registration issues and also because of issues related to the repatriation of earnings.

### **NEW PRODUCT COMMITTEE UPDATE**

- The NPC in America and Europe examined the issue of metals trading. They stipulated a number of contingencies before approval can be given, including more detail on the IT aspects. This trading will be done within FX when approved.
- The NPC is reviewing whether to allow the Turkish t-bill business that is currently being traded out of LBIE to be traded out of LBI instead. They are asking to change the legal entity to LBI for tax reasons. LBI trades other sovereigns, so this would not be out of the ordinary. The NPC is performing an infrastructure review before approving.

- The energy business has applied to trade swaps on commodities indices. This request is going through a subgroup review. The subgroup, which consists of about 30 people, is reviewing the business proposal with an eye towards infrastructure questions. [We requested a copy of the combined subgroup review/meeting minutes.]
- *Laura discussed her role with respect to the NPC – she has a 2-part role. A business can approach Laura’s group, who will first apply the NASD principles to determine whether something is a new product. Secondly, she will coordinate with the appropriate infrastructure groups who have a stake in determining whether something is new and would require modification of existing procedures, or whether it is more along the lines of ‘business as usual.’*

## **RISK APPETITE**

- RA usage was up to \$1476 from \$1270 million. Fixed income usage was up to \$1046 million, while Equities usage was down to \$321 million. Investment Management (\$300 million) did not significantly change. GTS (risk arb) was up to \$300 from \$225 million. Real estate was up to \$384 million.

## **MARKET RISK**

- Firmwide VaR was down slightly, to \$31 million from \$33.4 million the prior month. FID and Equity business line VaR was virtually unchanged month over month, with FID at \$26 million and equities at \$10.1 million.
- The VaR limits were slightly re-tooled, as the “pods” that we have heard about for the past few months were implemented.
  - Within FID, the categories are as follows: **Liquid Markets** (managed by Kashuik), comprised of IR products, Liquid market prop, FX, and Energy; **Credit Markets** (Alex Kirk), comprised of High Grade, High Yield, and CDO; **Securitized Products** (Dave Scherr), comprised of Mortgage Trading and Structured Finance; **Real Estate**, and **Municipals**.
  - For equities, the categories are **Liquid Markets/Execution Services**, comprised of cash products, portfolio, volatility flow, systematic trading, and event driven; **Convertibles; Volatility; Equity strategies; and Syndicate**.
  - **Global Client Services** (prime brokerage) is now being called Capital Markets Prime Services, and it now has a VaR attributed to it. This VaR is basically coming from Firm Financing, a repo desk that sometimes takes prop plays in advance of Fed action.
  - **Global Principle Strategies** is now on the report – this is the proprietary group headed by Rick Reider, the former head of high grade credit (this was mentioned in a prior memo). He has been on sabbatical, but is now back and has begun trading. Currently, much of their VaR of \$4.2 million is from being long the wide spread names and short the tighter ones. This is not really a new position – the proprietary portion of the High Grade

book has been stripped out and moved to GPS (which effectively reduced High Grade's VaR from \$12.2 million to \$9.1 million)

- Liquid Markets

- **IR Products:** The short position has been increased by \$100K/bp to an overall short of \$2.2 million/bp. \$1.3 million of it is in USD, and Lehman is short \$1.4 million in the Yen (down from \$2.1 million). Interest rate vega has continued to climb, reaching \$80.7 million (biggest contributor is Europe IR products, which has the Italy swaps). I can't see the \$80.7 number on the FID summary (it has \$91.4 million) – next month I'll ask Paul where his number comes from.
- **FX:** FX vega has increased from \$8.8 million to \$10 million (again, doesn't match the packet numbers), although Liquid Markets prop actually reduced their FX exposure. FX's long delta position fell (\$583 million to \$391 million). They are still short the USD versus the G10 currencies and many EMG currencies. A big exposure (\$178 long) remains in the renmimbi, as well as a surrogate long in the Malaysian ringit (\$107 million). The ringit positions has been cut from \$283 million, resulting from a P&L bleed caused by a weakening ringit. Emerging market currencies and spreads rebounded from last month, but the fear is still in the market (the curve is inverted, suggesting volatility at the front end), and skew remains extreme.
- **Energy:** VaR fell from \$4.3 million to \$4.0 million, driven by a reduction in the crude oil vega (from \$3.5 million to \$2.3 million). In addition, more granularity was added to the time series, reducing the VaR – prior mapping assumptions had been on the conservative side. Currently, Kinetix is dumping risk factors into Excel, where Ram Challa checks the data before it feeds into Lehman Risk. Paul hopes that this process will be automated by the end of August. Over the past quarter, energy has made \$20 million (with 2 \$7 million-plus days in June from their power basis trade). They have bled P&L through their long skew position.

- Equities

- **Overall:** Overall net delta increased, but the desk became longer gamma as well (increase of \$500 million) – creating an offset within VaR, which was unchanged at \$10.1 million. Within Americas, gamma flipped from short to long, and Asia increased its net long delta by \$350 million.
- There was a VaR spike in the middle of June, when delta increase from \$900 million to \$1.2 billion. Delta continued to increase (to \$1.6 billion) after the spike, but the business was much longer gamma and VaR came down. The gamma came from a client trade – an accelerated share repurchase by Home Depot. This trade was for 52.6 million shares, with a market value of approximately \$2 billion. Lehman borrowed (shorted) shares from the market and delivered them to Home Depot, and has been buying them back over a two month period (slated to end August 15). Lehman guarantees a ceiling on the price that Home Depot must pay (i.e.

they are short a call), and Home Depot guarantees a floor (sells a put to Lehman), resulting in a collar. Therefore, as the stock price falls, Lehman is long puts and long gamma (why would Lehman need a floor? If they are short and the stock is falling as they're covering, they're making money). Jim asked if this sort of trade on a specific stock could generate enough gamma to give protection at a portfolio level, and Paul said it could (which seems a bit odd). We might want to ask about this trade again next month, when we have asked to meet with the equity risk manager and product control head, to hear about the business and in particular the various desks taking prop plays.

- There were three small block trades - \$45 million in Crown sold in 1 day, \$103 million in Intuit placed in 2 days, and \$37 million in Federated was placed in 3 days.
  - We asked how to interpret the theta metric – this is essentially the 1-day loss, assuming Lehman is long vega, that occurs with every passing day (i.e. the amount that Lehman is paying in protection). In other words, Lehman is currently paying \$3.7 million/day in protection for its long vega position. Paul noted that as long as the firm is long vega (which it always has been during his tenure), they will be long theta.
- Global Trading Strategies
    - Equity exposure increased from long \$1.15 billion to long \$1.38 billion, due to increased merger arb plays (long Bell South versus short ATT). Also, their credit exposure increased, as the long GM position (GM and GMAC) went from \$380 million to \$423 million. These increases were reflected in the VaR, which went from \$5.7 million to \$7.3 million. As an aside, Paul told us that they only trade on announced mergers – there is no speculation, or “rumortrage.”
  - As Lehman puts more emphasis on these pure-prop groups (GTS and GPS), we might want a snapshot that shows their positions a bit more clearly. We only see their VaR – GTS’ equity positions do not show up on the equity snapshot, and GPS is not on the FID report.
  - Backtesting
    - Munis had an exception when the Fed hiked rates at the end of July, due to their muni basis trade (long munis/short rates). This is an issue of non coterminous pricing, where the muni market can lag the Treasury market by a few days. Ostensibly, the loss will be reversed when the muni market responds.
    - GTS had an exception due to Imperial Sugar, a stock that has showed up in prior write-ups (tends to be volatile). It was down 4% on the day.
    - Equities global had an exception on June 13, driven by Europe (we didn’t get much color on this) – I think it was a momentum trade.
  - Scenario Analysis

- Worst case stress loss comes from the equity crash scenario, with a loss of \$1,086 million. Equities losing \$374 million, with the majority of that coming from the Asia Volatility business. FID loses \$306 million, with ½ of that coming from High Yield. GTS loses \$250, mainly from long equity positions.
- Second worst loss is \$742 million, from Black Monday. FID loses \$254 million, and equities loses \$233 (majority from volatility flow books).
- Third worst loss is \$396 million, from the HY and Leveraged Buyout default scenario). FID loses \$246 million, and equities actually gains \$38 million as various businesses offset each other.

## CREDIT RISK

- The pipeline of deals by bucket is as follows:

Bucket	6/29/06	5/31/06	4/28/2006	3/31/2006	2/28/2006
Conditional deals	10,330	8,915	7,539	8,512	10,541
Contingent	1,600	1,473	1,231	603	1,878
Mandated, committed letter	11,879	13,628	12,672	10,268	4,407
Mandated, final docs	12,482	8,393	9,149	7,127	6,118

- Current exposure held steady at \$22.9bn (net of money lines). Italy remained the top generator of CE with an exposure of \$2.08bn, up \$181m from last month.
  - Lehman has focused on cross-selling with counterparties. That is, when they complete an underwriting with a corporate client, they also seek to sell them derivatives. The biggest example is TXU. TXU is in pipeline as a conditional commitment for financing (\$600m, with 33% probability) as well as derivative exposure for \$617m. We will follow up next time on the details of the two exposures.
    - Likewise, we have seen from the quarterly finance meetings that the derivatives inventory is increasing, corresponding to the increase in the credit exposure. Within the equities space, Gerry Reilly commented that Lehman is growing their derivatives market share, by (among other things) commoditizing variance swaps. This will also increase MPE, but not CE as these trades will generally be collateralized.
- The ELP for Russia was 124 this month, which is considered high for exposure to Russia. The exposure was driven by recent market events. Russia has agreed to buy back \$22bn in Paris Club bonds. Aries bonds are German-issued credit-linked notes tied to the performance of the Paris Club bonds. There is some uncertainty about the impact of the debt prepayment on the Aries bonds, specifically whether this is a credit event that will allow the bonds to be called. Given these market events, the Emerging Markets desk in London and the High Grade desk took a long Aries-short Russia trade.



- By mid-June, the performance of hedge funds seems to be improving. Hedge fund index returns for the year is 6.3%. Of the 850 funds that Lehman tracks, 16 funds, scattered across strategies, were down double digits in May. 89% of the funds have positive year to date returns. Margin calls were normal, with no appreciable changes in prime broker balances.
- The top sub-IG names included:
  - Vanguard Car Rental USA Holdings (CE \$36m): exposure from a 5 year fixed-floating swap
  - Timber Hill (CE \$16m): margin call that had not yet been paid (no problems, waiting on margin to be received)
- We asked about how Credit thought about the risk to financial sponsors, specifically within the context of the implications of reverse break-up fees. Patrick McGarry stated that each investment is a separate SPV and is thus firewalled. To deal with dividend recaps, they structure in “cash traps” which prevent the sponsors from being able to dividend themselves out.
  - Continuing the theme from last month, sponsors have been aggressively asking for covenant lite structures. Investors, however, have become more selective. Having the ability to restructure the pricing of a deal based on market conditions is key. Lehman has pushed back on flex and covenants until they have gotten comfortable with terms. They are seeing this selectivity especially in Europe.
  - Saga is an example of a deal with an aggressive ask that ultimately went to the Bank of Scotland. Patrick sees that the foreign banks generally have more of an appetite to keep these financings on their balance sheet and not worry about the syndication market. Lehman, on the other hand, is in the moving and not the storage business.
- The market is getting more difficult. Altice (\$1.056bn) closed in July, but they flexed up the mezz. The deal will fully clear, but Lehman’s hold position is up a little from what they anticipated. German Media Partners (\$245m) closed well and Lehman is at their desired hold level. One recap was pushed back until possibly October.
- The Intelsat deal was sold below expectations. The bond sale was reduced by \$600m to \$2.9bn due to reduced investor demand. The business had two choices, either (1) hold the syndication open for a few more weeks or (2) price the bonds, fund a portion of the bridge, and come back to the market in a few months. They decided to go with the second option, and took a \$120m residual exposure on a bridge loan which they intend to hedge. Lehman also has some senior exposure, which they expected. We will monitor this position in the coming months.
- A U.K. commercial real estate syndication is scheduled for July or August. We will follow up on this next month.

## **FOLLOW UP**

- A new proprietary group, managed by the former head of high grade credit, has commenced trading. The proprietary positions formerly housed in the franchise high grade business have been moved under their auspices, and they expect to put on new positions as well. It is our understanding that this group will focus mainly on credit strategies, but is not limited to a particular asset class. We will continue to request updates on this new group.

## **MONTHLY RESULTS/OTHER BUSINESS**

- Net revenues were down again, at \$1,249 million. That is below the YTD monthly average of \$1,472. Fixed income revenues were down again, at \$551 million (from \$763) with interest rate products and mortgages down. Rates saw a decline in sales credit, as well as some losses on strategies (e.g. the short rate position). In mortgages, both origination and securitization were down. Equities was down slightly at \$231 million – volume was down, but the liquid markets group had a solid performance. Investment Banking had a good month at \$249 million, in part due to the closing of the Time Warner/Adelphia deal. The fee pipeline is at \$912 million, just off the record of \$930. IM continued to perform well, with AUM now over \$200 billion.
- Europe and Asia experienced some weakness – they usually contribute in the mid-30s, percentage-wise, to overall revenue, but in July they only contributed 28%.
- Cash capital excess was around \$4 billion – Lehman anticipates that this number will end the quarter in the 3-4 billion range. As discussed, Lehman will do a \$1.1 billion dividend (now approved by the NYSE) at the end of the quarter, but this will only result in a \$300 million net affect on LBI as it will be offset by other moves (transfer of money from a sub to parent, etc).
- In addition, Lehman is going to be doing a broker v affiliate swap between LBI and LBIE, as a European customer wants to trade US-listed master limited partnerships (traded out of LBI) but the trades will be booked in LBIE. They will do a TRS, but which has no capital implications (hence, the 90-day notification is not triggered). They've told the NYSE about this.

## **RISK APPETITE**

- RA usage was up to \$1803 million, a big increase from last month's 1476. Fixed income usage was up at \$1382 million (from \$1046), while Equities usage up slightly, at \$373 million (from \$321). Investment Management (\$297 million) did not significantly change. GTS (risk arb) was up again, at \$314 million (\$300 last month). Real estate was up significantly at \$543 million, from \$384 million. Most of the increase in RA comes from bridge equity commitments of ~\$1.3bn in total across three deals (125 High Street, Boston; 1211 Avenue of the Americas, New York; and CarrAmerica DC Portfolio, Washington DC).

## LEHMAN STRATEGY UPDATE

- Madelyn provided an update on Lehman's overall strategy, as discussed during an offsite in March at an Executive Committee offsite a few weeks ago. The theme was that while capital has doubled over the recent past, the risk has not changed much. Therefore, there is going to be a concerted effort to grow risk in certain areas. We spoke with Paul after the meeting, who followed up on this. He noted that it is not risk management that is limiting the businesses, as the RA limit is at \$2.3 billion and to this point, it has been underutilized (usually in the \$1.4 billion range, although now up to \$1.8 billion). He also mentioned that the \$2.3 limit was conservative in and of itself – by their calculation, it should have been \$2.8 billion, but given that the prior year's utilization had been so low they did not want to increase it that much.
  - Credit appetite: Lehman wants to grow this, especially in the non IG space. They plan on doing this through the leveraged lending business – essentially by offering the associated derivative hedges (FX, rates). Some of the FX trades can be short-dated, but the rate swaps tend to be longer (3-5 years).
  - Emerging markets: Lehman plans to open a branch in Dubai and Qatar, and is considering Saudi Arabia. They continue to build out their business in Turkey, and are looking at Mexico. They recently bought a \$70 million NPL package in Brazil – their first foray into the Latin American NPL space.
  - Lehman continues to evolve its portfolio approach to hedge funds, rather than a product-by-product margin approach. We've heard this at other funds – basically, if you have a given tolerance to a fund, you can give on margin terms in one area, albeit at the cost of another product (which effectively gets crowded out). They are looking at DPB, or intermediation, but think of that as being an entirely separate business from this holistic hedge-fund approach.
  - India: There are currently 1100 Lehman employees in Mumbai. They are planning on building a capital markets infrastructure there, as well as using it for more traditional outsourcing purposes.
  - Canada: Lehman is considering reopening its Toronto office, and they are probably going to open an office in Calgary for the purposes of energy trading.
  - Lehman is also considering moving into Australia. They have decided not to pursue a China strategy, believing that it is overbanked.

## MARKET RISK

- Firmwide VaR was up to \$42 million, from \$31 million last month. FID drove most of the increase, with VaR ending the month at \$37 million. Equity was at \$12 million.
- **FID:** IR Products (within Liquid Markets) was over its limit – VaR was \$19 million versus a limit of \$16 million. Both liquid markets and FID overall with well within limits. The decision was made to increase both the IRP limit (in Asia and the US) and the pod's limit, which will show up next month. Overall FID limit will remain unchanged. Michael Gelban OK'ed this. Within the LM pod, Kashiuk did not want to cut back on either liquid markets prop, FX, or Energy. FX, which has been leaderless for a few months, has had low levels of limit utilization. However, they just got a new head, and it sends the wrong signal to immediately cut his limits. As for energy, utilization has also been low, but they don't want to cut their limits when they're encouraging the business to grow. And LMP has done well, so they don't want to cut those limits either (the limit was actually increased for LMP in Asia (?Europe)). If limit usage begins to creep up at either the LM pod or FID level, Michael Gelban will revisit the limit increases (or look to cut someone else's limit).
  - The increase in VaR was largely due to an increase in the short rate exposure, from \$3 million/bp to \$5.2. The short is across the dollar (\$3.1), yen (\$1.3), and Euro (\$1.1). In addition, the interest rate vega fell to \$71 million/vol point, down nearly \$10 million/vol point from last month. In last month's writeup, we noted that Paul's numbers have not been matching the number in the packet – he clarified at the meeting and said that his numbers do not include FX vol, which is included in the FID page in the packet (FX vol currently adds about \$10 million/vol point to the overall total).
  - FX delta is up to over \$1 billion, a twofold increase from last month. The desk continues its long renmimbi position, although they cut their renmimbi position (the renmimbi was down 1.5% over the month) and increased their ringit position. We asked if there was a reason for this, or just opportunistic. It's mostly the latter – the renmimbi positions tend to be non deliverable forwards, and when they roll off it can be difficult to re-establish them right away. The desk believes that signs of liberalization continue.
  - The long credit exposure increased in both HG and Real Estate, while GPS increased their short exposure, providing a slight offset. Real estate actually doubled their credit exposure to \$4 million/bp – we should ask about the drivers next month (no doubt tied into the increase in RA). GPS tends to take capital arbitrage positions, i.e. long the bond and short CDS and/or equity. They are now starting to put on new positions (before, much of the group's positions had been transferred from the HG business which had been under Rick Reider, who now runs GPS).

- Following up on the Russian Eries debt discussed last month, it has been determined that there is no early repayment provision, so when Russia pays of the debt the German issued-Eries backed debt will essentially revert to straight German sovereign debt – the spreads have been tightening to reflect this. It looks like Russia will, however, be paying a \$1 billion pre-payment penalty to Germany.
- Energy VaR was virtually unchanged at \$3 million. Crude oil vega was \$2.3 million, and the desk was overall long 427 lots of crude. On July 28, the desk made nearly \$1 million from a move in the crude curve. The desk was short NYMEX natural gas, and had on various location spreads. The main power positions are basis positions in the NE-Midwest, and in CA. As an aside, from the backtesting results it looked like energy had about 7 days of greater than \$2 million losses.
- **Equities:** Equity markets were mostly flat at the end of the month, with some swings intra-month. The long delta fell slightly, from \$1.46 to \$1.25 billion – this reflected the fact that the desk had no strong conviction about the direction of the market. There were 4 block trades – 3 were gone within 2 days, while one took a bit longer (and did cause a VaR exception, although in the end the position made money). There were no significant (if any) losses.
  - We briefly discussed the Home Depot trade, and asked how it had provided so much gamma protection. On its peak day, it had provided about \$100 million worth of gamma, due to the sheer size of the position – it is unusual for one position to give protection at the portfolio level.
  - Sandeep Garg (equities risk manager) and John Neave (equities product controller) went over the reconciliation of equities VaR categories with the revenue, and Sandeep broke down the equities businesses for us. The detailed description of each equity line of business will be detailed in a separate document.
- **Backtesting**
  - IR products had an exception due to their short rates position (expressed through Eurodollar futures and puts on Eurodollars) – yields went down throughout the month and tended to be very volatile.
  - There was a violation in mortgages that is still being investigated (they think the P&L isn't clean)
  - Violation in FX that was due to the market being closed and some aggregation of P&L – not a true violation.
  - GTS had an exception due to a sell-off in India, a bad day for GM, and volatility around Imperial Sugar (one of the regular culprits).
  - Sandeep Garg, the equities risk manager, walked us through the equities backtesting pages, and provided us with some insight as to each grouping.
    - Equities cash products had a violation due to an intraday block trade.

- Flow volatility tends to have very volatile P&L, as it is customer facing. This is because of a few things: customers want to transact frequently during times of high volatility, and while the business makes money overall there is a day-to-day P&L volatility. In July, implied vol was volatile itself, making for big swings. In addition, this business has the cash-futures basis position which faces non-contemporaneous pricing, discussed in prior memos. It is hard to strip intraday P&L in this area, as trading volume is so high. When options expire, VaR tends to spike. Theta is not captured in VaR, but it is in P&L. Finally, market risk is working in improving the modeling of implied vol by adding more parameters (we'll follow up on this).
  - Equity strategies had 2 violations, one resulting from a 30% drop in a \$7 million position in WebMethods, and one day that had losses in all 3 regions, effectively not getting the diversification benefit that VaR accounts for.
  - Event driven had an exception when the EU disapproved a Sony/Bertelsmann acquisition, and Warner dropped 17% (must have been expressed through Warner?).
  - Systematic trading is difficult to backtest, as the way that P&L rolls in is difficult to allocate. All positions are captured in VaR, however, so this is not a concern.
- Scenario Analysis
  - Worst case stress loss comes from the equity crash scenario, with a loss of \$1.3 billion. Equities losing \$279 million, with the majority of that coming from the US Volatility business. FID loses \$375 million, with ½ of that coming from High Yield. GTS loses \$376, mainly from long \$1.2 billion delta equity positions (M&A). Their losses are offset somewhat by gamma and vega gains from long S&P puts.
  - Second worst loss is \$1.1 billion, from Black Monday. FID loses \$322 million, and equities loses \$310 (majority from volatility flow books). GTS loses \$267 million (same reasons as above).
  - Third worst loss is \$821 million, from the Oil Supply Crisis (this is a change, last month the third worst loss was less than \$400 and was from HY and Leveraged Buyout default scenario). FID loses \$329 million overall, but energy actually makes \$87 million, which isn't surprising given their long oil vega. Equities loses \$211 million, primarily in Asia index vol flow which is short out-of-money option gamma and short vega.

## CREDIT RISK

- The pipeline of deals by bucket is as follows:

Bucket	7/28/06	6/29/06	5/31/06	4/28/06	3/31/06	2/28/06
Conditional deals	7,894	10,330	8,915	7,539	8,512	10,541

Contingent	2,045	1,600	1,473	1,231	603	1,878
Mandated, committed letter	15,234	11,879	13,628	12,672	10,268	4,407
Mandated, final docs	10,933	12,482	8,393	9,149	7,127	6,118

- There was a decline in the Mandated, final docs commitment bucket, which generally consists of real estate deals awaiting securitization. During July there was some monetization of UK real estate deals. They anticipate further sell-down of real estate deals into October.
- Two high yield deals in the travel industry, Travelport (\$1bn) and Carlson Wagonlit (\$471m), fortuitously priced the day before the latest terrorist news. They did not have any pullout of investors, and in fact were oversubscribed. Some investors phoned to express concerns after the news broke, but did not pull out. Lehman has a revolver hold position in each deal, as expected. For Travelport, which owns Orbitz, the hold position is \$40m, and for Carlson they are targeting a \$30-60m hold, after funding briefly before close.
- The European market has been very quiet in August, as usual with the summer holidays. Lehman got the Prysmian Cables deal done this week (\$385m), and expect few deals to be completed before September. Also in the U.S., they expect the West Corp deal (\$1,360m) to go to market in September.
  - The market continues to be selective, but they will be testing it in September when several deals get priced and go to syndication. Lehman feels that they have the right credits and structures, but they will see what investor appetite looks like in September.
- The CarrAmerica deal appears in the Mandated-Commitment bucket. This is total funding of \$2.624bn, \$800m of which is bridge equity being offered in September, and the remaining amount would be funded in 2-3 months before a CMBS takeout. Lehman will actually be funding this, but the lending is collateralized with commercial real estate properties in the DC area.
- We asked about any current exposure to hedge funds. Hedge funds generally have low unsecured thresholds, in the neighborhood of \$1m, which are really to avoid nuisance margin calls as a result of daily market changes. Any substantial CE results from margin calls that have been issued and not yet received. NPE (net potential exposure) is the primary metric for hedge funds used to capture the sufficiency of collateral, and is calculated as VaR minus the equity in the account. They also spoke about establishing credit lines for hedge funds, so instead of micromanaging margins on positions, credit analysts would have some discretion about margin on individual positions while maintaining an overall aggregate level of exposure.
- Current exposure was down slightly to \$32.717bn (\$21.687bn net of money lines). Italy remains the largest CE, with an MPE of \$5.985bn.



- A new quasi-FRL loan was made to Fortress Investment Group in the amount of \$600m, for a total facility of \$1.5bn, to fund their purchase of Interwest. The fee structure differs somewhat from traditional FRLs.
- Peter Galbreith, a recent hire from Morgan Stanley, gave us an update on counterparty credit risk in energy trading.
  - Currently, Lehman has trading activity with 50 counterparties, and they have executed 7,200 docs. The portfolio currently contains fairly plain vanilla forwards, swaps and options, but they are looking toward structured products in the future. To date, substantially all of the credit exposure has been to investment grade counterparties, but they expect to incur exposure to non-investment grade counterparties as well.
  - Top counterparties, based on MPE, are Hess Corporation (iBBB-) with an MPE of \$58m, BP Corp. (iAA) with an MPE of \$38m, Morgan Stanley Capital Group (iA+) with an MPE of \$35m. Most exposures are short term, and all exposures are margined. They have very low CE for dealer counterparties, but do have some CE for exploration companies who do not post margin.

#### **ACCOUNTING POLICY**

- We met with Marie Stewart, Global Head of Accounting Policy, to discuss her role as well as Fair Value Measurement rule changes.
- Corporate Accounting Policy, besides setting Lehman policies, consults with other areas of the firm about the accounting implications of transactions. In addition, they educate others when new accounting standards are issued, and monitor and participate in industry groups.
- Marie gave us an overview of SFAS 157 on Fair Value Measurement. Christine Smith and Neeraj are leading a group to deal with global adoption of the standard. Lehman anticipates that they will early adopt as of December 1, 2006. EITF 02-03 reserves, currently a couple hundred million, as at 11/30/06 will be credited against opening retained earnings as at 12/1/06.
- Lehman will also use the Fair Value Option, which allows Lehman to record certain financial assets and liabilities at fair value with changes in fair value reported in income on a contract-by-contract basis. Lehman also plans to early adopt this standard as well as of 12/1/06. Eventually, the only items not subject to fair value at Lehman will include items such as Lehman's equity investment in hedge funds.

#### **FOLLOW UP**

- Senior management at Lehman has instituted an initiative to increase their risk taking activities across a number of areas. Their current Risk Appetite, an aggregate measure of risk across the firm that incorporates market, credit, and

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event risk, is at \$1.8 billion versus a limit of \$2.3 billion, and thus senior management feels there is room for additional risk-taking. Notably, they plan to increase their exposure to non-investment grade counterparty credit risk through increased cross-selling of derivatives to leveraged lending clients. We will closely monitor the risk governance issues that arise as these initiatives are implemented.

**MONTHLY RESULTS (KRISTINE SMITH, TONY STUCCHIO)**

- Monthly results were up in Fixed Income (+18%) and Equities (+59%) versus average month '05. Within FI, commercial real estate activity was a strong contributor to revenue growth. Equities saw strong customer flow on cash and derivatives business, as well as strong prime services. In addition, there were EITF releases during the month. Investment Banking was basically flat versus average month '05. Advisory revenue was down, due more to timing of the completion of deals as opposed to a slowdown in the pipeline. Equity origination revenue was up on increased volumes and increased derivatives activity. HY leveraged lending transactions were up. Investment Management was up 28% over average month '05.
- Third quarter earnings results were released in September. Across the board, the firm was down versus 2Q06 but up versus 3Q05.
  - Fixed income: Securitization volume was strong. In the residential space, 49 deals were completed versus 55 deals in 2Q. There was strong activity in the commercial space as well. Real estate had a record quarter, with 61% of the activity in the US, 11% in Europe, and 28% in Asia. Origination results were solid given the new environment, but down 30% YTD versus 2005.
  - Equities: Equities had strong customer flows and strong prime services. Prime broker balances were strong. Liquid markets were down 42% versus 2Q06 in which there was a large NYSE gain. Derivatives revenues were down, specifically, prop strategies were down mitigated by increases in flow in Europe and increases in structured products for clients.
  - Investment Banking: Advisory and origination were down. M&A was down 20%, versus an overall decline in the market of 13%. Equity origination was down as well but Lehman's market share was growing. There was a record fee pipeline at the end of the quarter.
  - Investment Management: AUM was at \$207bn. PIM had strength in both equities and fixed income.
  - Non-US revenue accounted for 38% of the quarter's results, or \$1.6bn. Europe had a record \$1.2bn in revenue, across products. Revenues in Asia were \$0.4bn, down 17% on lower equity volume mitigated somewhat by an increase in real estate activity.
- LBI Excess Capital was at \$4,371m, down from \$5,039m as of May 06. LBI issued a \$300m dividend during the quarter, and also issued some subdebt. Net income for LBI was at \$123 versus \$126 for average month '05.
- Neuberger Berman sold its clearing operations to Pershing, and will be out of the business in 2007. Neuberger will continue to clear prop accounts only.

## RISK APPETITE

- RA usage was up to \$1,997, the second month with a large increase (from \$1,476 to \$1,803). Fixed income usage was up at \$1,454 million (from \$1382), while Equities usage was down slightly, at \$366 million (from \$373). Investment Management (\$326 million) was up a bit. GTS (risk arb) was up again, at \$331 million (\$314 last month). Real estate remained up significantly at \$553 million, from \$384 million.

## MARKET RISK (PAUL SHOTTON)

- Firmwide VaR was up to \$48.52 million, from \$40.66 last month and \$31 million in the prior month. FID was up to \$39.08 from \$36.94m, while Equity was down slightly to \$10.65m. The increase in VaR was caused by a decrease in the diversification benefit. GPS went short, which correlated with the shorts in FID causing the increase in firmwide VaR.
- **FID:** As discussed last month, IR Products' limit was increased from \$16m to \$22m. There is strong demand to increase risk, and risk management is comfortable with increasing risk-taking in this space as it is the most liquid. Within Europe, IRP VaR was slightly over the limit, but the overage did not generate a lot of discussion given the capacity in Americas and Asia. The position was back under the limit in a few days. Emerging markets was moved out of HG on August 30. HG now has a limit of \$10m, while EM has a limit of \$9m. Previously, they jointly had a limit of \$16m.
  - Global VaR for IR Products increased from \$19.47 to \$21.58m over the month. The short rate exposure was increased to \$5.6 m/bp, the largest short position the business has taken. Interest rate vega fell from \$71 m/vol point to \$37 m/vol point. Over the month, there was a rally in vol from its historical low. The market now appears to be betting on a cut in rates in the next 6 months due to weakness in the housing market. The business decided to take profits and re-establish the position if the market goes back down.
  - FX delta decreased from \$1,036m to \$454m. Overall Lehman was net flat against the major currencies. The Euro position flipped from long to short, and the long yen position was decreased. They are bullish on Brazil and Mexico. Senior management has an increased risk appetite for emerging market positions (the carry trade). Since the coup in Thailand, they have backed off a bit. Risk aversion seems to have left the markets last month.
  - The long credit exposure in HG declined from \$5.1m to \$2.3m. The long position in Real Estate increased again to \$5.081m due to retained CMBS positions and secondary market positions. (Note that the increase in Risk Appetite for real estate was due to bridge loans.)

- Energy VaR was down slightly to \$2.82m. Crude oil vega was \$725K, down from \$2.3m last month, and the desk was overall long 27 lots of crude. The desk remains short nat gas, and the main power positions remain basis positions in NE-Midwest and in California.
- **Equities:** The long delta fell slightly, from \$1.25b to \$900m at month-end, and has fallen further still. The desk has no strong conviction about the direction of the market. There were 7 block trades which were distributed in a few days. The largest was an \$850m Sallie Mae block. The next largest was \$250m, and the rest were smaller.
- **Backtesting**
  - Mortgage trading had an exception on 8/14, which risk management is investigating. The P&L is probably not clean.
  - Global equities had an exception on 8/21. Flow Volatility had a \$2.69m loss on that day (no details given).
  - Systematic Trading had an exception, which was not a “true” exception. The loss resulted from a blind risk basket trade that had a \$2.6m markdown from the fee being taken out.
- **Scenario Analysis**
  - The credit spread shock factor was increased in the stress scenarios from 30% to 50% based on current market conditions.
  - Worst case stress loss comes from the equity crash scenario, with a loss of \$1.879 billion. Equities losing \$595 million, with the majority of that coming from the US Volatility business. FID loses \$583 million, with \$177 million of that coming from High Yield. GTS loses \$373, mainly from long \$1.36 billion delta equity positions (M&A). Their losses are offset somewhat by gamma and vega gains from long S&P puts.
  - Second worst loss is \$1.594 billion, from Black Monday. FID loses \$508 million, and equities loses \$606 (majority from volatility flow books from negative gamma). GTS loses \$266 million (same reasons as above).
  - Third worst loss is \$1.211 billion, from the Oil Supply Crisis. FID loses \$520 million overall, but energy actually makes \$56 million, which isn’t surprising given their long oil vega. Equities loses \$315 million, primarily in Europe from short out of the money gamma.

#### **CREDIT RISK (STEVE SIMONTE, PATRICK MCGARRY)**

- We discussed Lehman’s situation with respect to Amarenth. Amarenth had been a client for quite some time, with exposures in prime brokerage, repo, and CDS. Lehman did not have any energy related exposure to Amarenth.
  - Prime brokerage balances have been almost entirely wound down now, with \$1m in Long MV and Short MV remaining. The balances had moved away, primarily to UBS and Morgan Stanley, prior to the meltdown.

Lehman owes them \$300,000. Amarenth had a term lock agreement with Lehman which has now been terminated.

- Lehman has \$107m in reverse repos with Amarenth on MBS, ABS, and corporate bonds. They have a \$25m net cushion on these exposures.
- Amarenth had a large CDS book with Lehman. They had 4 bespoke trades where Amarenth sold the equity (e.g., sold protection on the basket) on the 0-3% loss piece. The position is delta hedged with single name CDS, and what is left is a correlation trade. The margin charged by Lehman depended on having the delta hedging in place, and was at 32% margin requirement. One trade was unwound on the previous Friday, three were unwound on Monday, and all the trades settled the day prior to our meeting. A single name short CDS position is still on, which leaves Lehman exposed to contracting spreads. In addition, a Turkish TRS and a variance swap have been unwound. They currently have \$57m in excess margin.
- Amarenth had also engaged in some securities lending with a broker-dealer affiliate which resulted in net positive CE. As of last Friday the exposure was \$11m overcollateralized. The exposure now consists of 2 loans and no borrows.
- Lehman bought some bank loans from Amarenth during the fire sale, which were DVP settled to mitigate settlement risk.<sup>1</sup>
- Lehman had rated Amarenth highly prior to this meltdown, and felt that they had a robust infrastructure and were very transparent in their dealings with Lehman. Steve Simonte's understanding of the timeline of events is as follows. In June, risk management within Amarenth told the energy traders to reduce their book, but they could not because the liquidity in the market was not there, and risk basically let them pass. The breakdown seems to be the lack of top layers of corporate governance to force the liquidation. Steve noted that Ram Challa (energy market risk manager) had been talking about the size of these positions a few weeks ago.
- Amarenth's NAV has declined from \$8.4bn to \$3.3bn, and positions include a credit portfolio, some Canadian assets, emerging markets, and mortgage residuals. They are likely to restrict redemptions, and NAV covenant breaches are also likely. Lehman will decide what to do at the end of the month regarding any breaches.
- Amarenth accounts for \$25m within all of Lehman's Fund of Funds, and thus they are not concerned about this exposure.

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<sup>1</sup> Delivery-Versus-Payment accounts, also known as DVP/RVP (Receive-Versus-Payment) accounts or Certificate on Demand (C.O.D.) accounts are used primarily by institutional and professional investors and are used to settle transactions on an efficient basis to ensure that the securities and the cash change hands at the same time. Transactions in DVP accounts are settled through DTC by the Commercial Banks who actually hold the customer securities and cash. Broker Dealers also offer a type of DVP account called a Prime Brokerage Arrangement where the broker/dealer performs the role of the Commercial Bank in Standard DVP Accounts. Source: <http://www.securitiesindustry.com/portal.cfm?pg=plclearing>

- Going forward, Lehman hopes that this event strengthens their hands with other hedge funds. This is especially true when they are trading energy with hedge funds, and the hope is that they can demand more margin. Credit is doublechecking any clients trading energy as well as any funds that have seen strategy shifts.
- The pipeline of deals by bucket is as follows:

Bucket	8/31/06	7/28/06	6/29/06	5/31/06	4/28/06	3/31/06	2/28/06
Conditional deals	9,601	7,894	10,330	8,915	7,539	8,512	10,541
Contingent	6,102	2,045	1,600	1,473	1,231	603	1,878
Mandated, committed letter	14,052	15,234	11,879	13,628	12,672	10,268	4,407
Mandated, final docs	12,325	10,933	12,482	8,393	9,149	7,127	6,118

- August was more active than they had anticipated with deals in the pipeline, especially with real estate transactions. They have a full calendar of deals, and the forward pipeline is large at \$100bn. Specific deals discussed include:
  - Firth Rixson (\$512m, mandated final docs), a UK based aerospace metals supplier. This deal was flexed down due to heavy demand. [Press reports show that Lehman's private equity group purchased a 36% stake in the company from Carlyle Group in September. Clarify Lehman's role in this transaction next month.]
  - West Corp (\$1,360m, 90% prob, commitment letter), a take private deal with DH Lee is expected to close in October
  - ITC Holdings (\$440m, 90% prob), acquisition financing of Michigan Electric is expected to close in October
  - Travelport, discussed last month, traded off (down to 97-98 range) but has now been closed. Carlson, also discussed last month, has done well in the market.
  - Precision Partners (\$130m, mandated final docs) was not well received in the market. This is an auto parts supplier of frames, and CSK Auto paper hit the market at the same time, hurting demand. Lehman funded the \$130m first lien piece and will attempt to sell in the secondary market in the coming weeks. Lehman sold all the second lien piece, which is typically tougher to place, after flexing up the pricing.
  - A couple of deals are now gone, since sponsors lost their bids – Warner Music and TravelCenters.
- Following up on a recent market trend, Patrick reported that covenant lite structures are now off the table.

- Current exposure was down to \$24.309bn (up to \$23.709bn net of money lines). Equity finance/repo activity was up over the month, with most of the activity occurring in Europe. Italy remains the largest CE at \$1.516bn, with an MPE of \$5.282bn. The distribution of Internal Credit Ratings is virtually unchanged from last month.
- Effective Oct. 1, the industry will be required to increase disclosure in agency lending transactions.<sup>2</sup> This will give Lehman greater transparency as to who the counterparty is behind an agented lending transaction. Currently, Lehman transacts with 30 agent lenders, and these 30 lenders will now disclose on 8,000 counterparties. Lehman is unsure how they are going to deal with rating all these counterparties, given the large number and the existing \$1m materiality threshold (out of the 8,000, Lehman has activity on 3,700, and the list moves daily).

#### **AUTOMATION OF THE LEHMANRISK RECONCILIATION (BETH RUDOFKER, MIKE BISHOP)**

- We met with Beth Rudofker, head of Internal Audit, and Mike Bishop from Product Control, to discuss progress on the automated reconciliation of the LehmanRisk System to the Books & Records (B&R) System to ensure Lehman's VaR is based on the complete set of firm trading accounts.
- The reconciliation process includes two distinct reconciliations: one at the ledger/account level and one at the position level. At the ledger/account level, a tolerance level of 3% has been set, and at the position level a tolerance level has been set at \$10m.
- The reconciliation starts with the B&R population and filters out a number of accounts that are known to be excluded from LehmanRisk, such as the banking book, flat accounts, customer accounts. The automated reconciliation tool is refreshed overnight, and pulls together the LehmanRisk and B&R data and exports matched and unmatched results to an Excel spreadsheet. Product controllers can then analyze the unmatched accounts to manually match accounts wherever possible.
- Currently, the automated tool requires a one-to-one mapping of positions. A new version in November will not have this requirement. There are many instances of a "many to one" relationship between positions in B&R and in LehmanRisk.

#### **FOLLOW UP**

- The VaR-based limit for Interest Rate Products ("IRP") was increased from 16 to 22, and usage for the month was at 98% of the limit. There is strong demand to increase risk-taking at Lehman, both in this business and in others as discussed last month. Market risk management is comfortable with growing the IRP

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<sup>2</sup> For background on this issue, see <http://www.sia.com/ops2006/pdf/AgentLenderDisclosurePANEL.pdf#search=%22agent%20lender%22>



business because of the liquidity available in the market. Total Fixed Income VaR and Firmwide VaR were not increased, however, and risk management is monitoring utilization at these more aggregate levels for any possible limit breaches. We will continue to monitor the increased risk-taking at the firm as expressed through limit changes

**MONTHLY RESULTS (KRISTINE SMITH, TONY STUCCHIO)**

- September was a weaker month across the board. Net revenues were down to \$1.2bn from average month '06 of \$1.45bn. ROE fell to 15.4% from 23.8% average in 2006.
  - Fixed income revenues were down 21% to \$558m on lower activity across several product areas. Real estate revenues were down due to a decreased transaction volume (1 deal completed versus an average of 4). Interest rate products were down on decreased customer flow and an especially weak performance in Asia. In addition, Lehman was on the wrong side of trades during the month (see bullets below). On a positive note, there were solid revenues in the commercial space and mortgages were solid in September on \$4.6bn in originations (down 8% versus avg month '06 but spreads came back).
  - Equities revenues were down 23% to \$226m. Contributing to the declines were equity strategies and execution services in Europe.
  - Investment Banking revenues were down 17% to \$212m. Equity origination was off 54% but slightly offset by a 7% increase in debt origination. The fee pipeline remains strong.
  - Investment Management revenues increased 4% to \$204m. AUM continues to improve with positive inflows during the month.
  - Non-US revenues declined, with Europe down 16% to \$278m. Real estate, interest rate products, and equity cash contributed to revenues. Asian revenues were down 56% to \$65m. The 2Q06 number included a one-time \$140m gain on a real estate deal, so the drop is not as precipitous as it appears. Revenue contributors included real estate and interest rate products.
- LBI Excess Capital ended the month at \$4.361bn, which includes some affiliate debt charges and increases to operational charges. Lehman is contemplating more dividend payouts by the end of next month. LBI net revenues were \$421m and net income was \$167m.
- Lehman has made a \$3m investment in "Bids," (Block Interest Discovery Service) an electronic platform for block trades which will help develop pricing transparency in this area. The other CSE firms (with the exception of Bear), Citigroup, and UBS have also joined this consortium.
- Lehman is considering resurrecting their Canadian broker-dealer, which was virtually but not officially liquidated. Apparently, there has been a change to Canadian pension law, now requiring them to invest only 20% of their money in Canadian securities (?), rather than 85%. It seems that Lehman considers this to be a good opportunity to get back in the Canadian market.

**UPDATE ON NEW PRODUCT COMMITTEE SUB-GROUPS (LAURA VECCHIO)**

- Laura Vecchio gave us an update on the activities of the NPC sub-group and ICCOG's (her group) role in the process. ICCOG works to manage the NPC pipeline. When the business has a new product, or a variant of an existing product, they will complete a "NPC Americas Approval Request Form." The form asks for details of the product following the NASD new product guidelines (get copy of this). Questions include whether or not the product is new to the marketplace or to the Firm, whether the product requires material operational or system changes, or whether the firm is proposing to sell a product to retail investors that it had previously only sold to institutional investors. Based on the answers to these questions, the product will either be reviewed by the full NPC or by an NPC subgroup. There is no formula guiding the assignment of a product to the full NPC versus the NPC subgroup, rather the answers are taken as a whole. This process is being audited under the umbrella of the corporate governance audit.
- An example of a product that went to the NPC subgroup was Commodity Index Trading (Total Return Swaps and Excess Return Swaps on commodities indices and structured notes linked to commodities indices). The subgroup consisted of representatives from all the control functions, including Risk Management, TMG, Legal, IT, Compliance, Accounting Policy, Product Control, Financial Control, Tax, Operations, Audit, and Treasury. Each department performed an infrastructure review, and contingencies were put into place before approval was given to allow trading of these products. The group coordinates via email, and all control functions must sign off before a product is approved.
  - We note that many of the processes involve the use of spreadsheets. We will follow up on this aspect with Laura and also at our next internal audit meeting.

#### **RISK APPETITE**

- RA usage continued its upward swing to \$2,050. Fixed income usage was up at \$1,552 from \$1,454 million, while Equities usage was down slightly to \$356 from \$366 million. Investment Management (\$393 million) was up a bit. GTS (risk arb) was up again, at \$351 million. Real estate remained up significantly at \$590 million.
- Paul noted that when VaR and RA limits were set in May, the RA limit was lower than the formula would have suggested, leaving Lehman with "headroom." For much of the year, they have operated well under that \$2.3 billion limit, but as RA usage has ticked up rapidly in the current quarter, they are considering increasing the RA limit prior to the end of the year to \$2.6bn.

#### **MARKET RISK (PAUL SHOTTON)**

- Overall VaR was relatively unchanged, at \$47.4 million, down slightly from \$48.5 million last month. FID VaR was up slightly at \$41.9 million (from \$39.1 million) and Equities VaR was also up slightly at \$11.2 million (from \$10.7 million). It's somewhat unexpected to see firm VaR fall as both equities and FID had VaR increases, but there was an increase in diversification, partly driven by benefit from the HY and HG businesses.

- Business specific
  - Lehman was short rates all month, and therefore on the wrong side of market moves. The position peaked at short \$5.5 million/bp, and ended the month short only \$1.5 million/bp. They took losses and cut positions (before the market rallied at the beginning of September, which meant that they didn't necessarily recoup those losses).
  - The interest rate vega position fell again, from \$36 million to \$9 products. Europe was down by \$20 million, Asia was down by \$2.7 million, and the US saw a drop as well. The cap vega position hasn't changed, rather the moves have been through a change in swaptions vega. These changes are not related to the Italy trade. Lehman remains long vega in Japan (where they are bleeding P&L) and Europe, and is short vega in the US.
  - Lehman increased its long FX vega, with most of the increase coming from FX and a small amount coming from liquid markets prop. They were long \$415 million of foreign currently, but were closed to flat by the end of the month. They ended short \$200 million in both the Euro and GBP, and short \$140 JPY and short \$135 CHF. The overall long position in emerging markets was cut, with a short position on in Turkey. They increased the long in the Renmimbi to \$128 million, and are \$115 million long the Brazilian Real. The appetite for emerging market currencies decreased during the month, affecting Hungary, Turkey, Poland, and Brazil, among others. Paul noted a minor flight to quality following Amaranth. The ZAR was particularly weak throughout the month.
  - Credit markets didn't change much over the month. HG nearly doubled their long credit spread position to \$4.2 million, but Paul said that there was no particular story driving the increase. It looks like the increase came primarily from the US and Europe. Paul did note that GM spreads continue to recover.
  - There was a very large customer trade in mortgages – a large customer sold Lehman \$35 billion in Fannie Mae 5% coupons. The position was duration neutral, so it had no rate risk (only spread). They sold \$15 billion in the first day, and were left with \$8.5 billion in spread risk. After three days, they were left with only \$3.2 billion. The desk did blow through its limit, but there was not a breach at the FID level. The trade occurred around September 26, when there was a small (~\$3 million spike) in the FID VaR, but it wasn't that dramatic. For such a large notional, Paul didn't seem to feel that this was a particularly risky trade.
  - Long equity delta increased to \$1.36 million – there is little strong conviction as to market direction. The gamma was down slightly (leading to the slight increase in equity VaR), and the vega was up. Block trading was light, with only three trades, all of which were placed in a day or two. The biggest was a \$110 million block of Montpelier Re.
  - GTS, GPS, and energy all had very little VaR change month-to-month. Within energy, the desk was long crude oil vega, and overall short 346 lots of crude. In gas, the desk was long 267 lots, mostly in 2006 and 2007. There

were also some gas basis trades. Power had basis positions in the NE-Midwest, and in CA.

- Stress tests
  - The worst-case loss was \$1.8 billion, resulting from Equity Crash. FID loses almost \$600 million, from HY, long loan positions (currently long \$8.7 billion), and many other positions. GTS loses about \$500 million due to its long \$1.6 billion in equity delta. Equities loses \$443, half of that from volatility flow. Investment management also losses money (~\$250 million) from long equity exposure. The rest of the losses are spread out across the board.
  - The second worst loss is \$1.5 billion, from Black Monday. Again, FID contributes the most, at \$541 million. Equities loses \$400 million, and GTS loses \$320 million.
  - The third worst loss is \$1.2 billion, from Parallel Move Down. Here, FID loses \$722 million, again led by HY and long loan positions. GTS loses \$239 million, IM loses \$112, and equities only loses \$83 million (although vol flow loses \$96 million, which is offset by long gamma in the variance swap book. Volatility trading also offsets the gain, as they make \$142, mostly in Asia and the US.
  
- Backtesting results
  - There were some fairly hefty firmwide losses (~\$25 million) at the end of September, which is unusual – these relate back to the earlier bullet of being on the wrong side of rate moves. There were no VaR exceptions, however.
  - There was an exception in munis that resulted from the muni basis trade (long munis, short Treasuries) that occurred when munis lagged Treasuries.
  - There was a fairly large loss (\$8 million) in energy which caused an exception at the beginning of September. The desk was on the wrong side of an oil options skew trade, where they were long out of the money calls and short out of the money puts. The curve flattened, and they lost \$8 million between both legs. Interestingly, Gerry Riley noted during the following day's quarterly P&L meeting that the energy business has made about \$20 million YTD, with power making around \$50 million but oil offsetting that with at least \$25 million in losses.
  - GTS had an exception caused by Imperial Sugar and a few other stocks (ATT, Charter Sugar).
  - Equity cash products had a couple of exceptions when they were short the telecom sector and that sector rallied.
  - Volatility flow had a few exceptions, no major stories (they are required to take all customer trades as they are a flow desk)
  - Portfolio had two exceptions – as we have discussed, this is a hard area to apply VaR to.

- Event Driven had an exception at the end of the month driven by a Scandia position, around news regarding Scandia and Man.

**PRICE VERIFICATION OF REAL ESTATE (NEERAJ CHOPRA, ABEBUAL KEBEDE, JONATHAN COHEN)**

- We had our first quarterly price verification review, with a focus on Real Estate Americas - the commercial real estate group (I would assume the valuation process is the same globally? We might want to clarify at some point). We began with a quick overview of FID variances for the month of August. Most of the FID variances occur in level 3 and 4, and are driven by the real estate business. Variances in level 1 tend to be the most worrisome, as those are the most observable markets and the least likely to have legitimate uncertainty around pricing. Total variance across all levels was \$86 million (conservative, meaning that the trader was more conservative than PC). Jerry Shi also briefly walked through the equities division price verification summary.
- There are six real estate asset categories: principal transactions (PTG), fixed rate loans, floating rate large loans, B-Notes/mezz loans, CMBS, and REIT lines of credit. Total exposure is \$16.6 billion, with the largest piece coming from PTG (\$7.3 billion)
- PTG consists of highly leveraged debt and equity investment in commercial real estate. Lehman receives monthly data tapes as asset level information, which is used to price inventory in this category. For debt, collateral value is derived from independent sources, and discount rates are taken from spread in an industry newsletter that is the “authority.” The model determines the PV of cash flows (a basic DCF model), and caps value at 105% of outstanding principal balance. PC takes the minimum of capped face, available proceeds or PV (like market value, based on comps). And compares this to the basis (the face times the mark), obtaining an under or over valuation. The variance threshold is \$3 million. The presentation has examples of pricing both the debt and equity portions. For equity, collateral value and discount rates are determined in a similar way, and price is modeled using a waterfall approach. Thresholds are \$1 million for overvaluation, \$3 million for undervaluation.
- Fixed rate loans are warehoused for less than 60 days on their way to being securitized. There are generally 5 to 6 securitizations a year through a joint program with UBS. Prices are tested using a mock securitization which builds off the most recent comparable Lehman securitization. Aged inventory over 180 days is scrutinized more carefully. Major deviations (1 to 4 %), upon securitization, from the expected profit level are investigated. The presentation has a good example of this price test.
- Floating rate large loans are securitizable floating rate loans – there is usually only one securitization a year in this area (Lehman goes on its own). Loans range in size from 30 to 500 million. As Lehman only has one or two securitization a year, there is not sufficient info for mock securitizations. There is limited upside (can’t go over par as no prepayment penalties) and downside results from collateral deterioration (covered by business through due diligence) or widening of origination spreads (no

rate risk). Product control works with the business to determine if aged positions are impaired, but there is no specific price testing except with collateral event of inventory over 9 months. Floating rate loans that are non-securitizable are tested using the PTG model discussed above.

- B-Notes/Mezz loans – stripped out from floating rate large loans with LTVs under 80%. Collateral value is based on third party appraisals, discount rates come from spreads obtained from industry newsletters, and the price is testing using an NPV model. PC looks at the PV, available proceeds, and capped face value (100% of balance for floating, 105% for fixed rate), takes the minimum, and looks for a variance. Variance thresholds are \$1 million for overvaluation, \$2 million for undervaluation.
- CMBS – CMBS bonds and IOs. Positions are tested using third party pricing data from a variety of sources, and trader prices are tested against averages from the data sources. Threshold is \$500 million.
- REIT LOC – loans made to real estate operating companies, may be collateralized by mortgages on operating properties. PC interpolates a discount rate from a website which has spreads based on term loans and revolvers. REIT LOC and term loans are verified using an NPV on individual loan characteristics. Thresholds are \$1 million for overvaluation, \$2 million for undervaluation.
- PC has additional valuation procedures – all details in play are reviewed for potential adjustments, and there is a quarterly review for PTG to see if deferred interest or exit fees should hit P&L, and there is a quarterly valuation review which looks at all PTG assets (800 positions – about 70 will have variances and there will be a deeper dive into these).
- Total pricing variance for the business was \$98.7 million, which includes \$37.6 million attributed through mock securitization.

#### CREDIT RISK (STEVE SIMONTE, PATRICK MCGARRY)

- The pipeline of deals by bucket is as follows:

Bucket	9/29/06	8/31/06	7/28/06	6/29/06	5/31/06	4/28/06	3/31/06	2/28/06
Conditional deals	9,254	9,601	7,894	10,330	8,915	7,539	8,512	10,541
Contingent	2,958	6,102	2,045	1,600	1,473	1,231	603	1,878
Mandated, committed letter	15,031	14,052	15,234	11,879	13,628	12,672	10,268	4,407
Mandated, final docs	12,114	12,325	10,933	12,482	8,393	9,149	7,127	6,118

- The amount of activity in the energy space is increasing, but so far Lehman has not seen any chunky deals, such as hedges for power companies on financing deals. The business has completed 5,000 OTC transactions to date with 120 counterparties. [I spoke to Steve Simonte after the meeting about getting greater clarity on the energy

counterparties generating CE and PE, and hopefully next month the risk package will include top exposures in this space.]

- Current exposure was at \$23.177bn for the month. Credit went live with the initiative to disclose agent lenders in the US on October 1, so next month we will see this. Exposure to non-IG counterparties remained low at \$455m. As discussed during the past few months, we expect to see that number begin to increase as the initiative to increase activity in this space gets off the ground. [I also spoke to Steve about getting more information in our monthly risk package on top NIG names generating CE and PE. Stay tuned.]
- Patrick provided some more color on the Firth Rixson deal discussed in last month's writeup. Firth was put up for auction by Carlyle, who wanted to monetize the gain on their investment. Lehman underwrote the debt (\$512m). The Lehman Co-Investment Group, a walled off private equity group, participated on the equity side. This continues the trend seen at other CSE firms of multiple roles in deals (see, for example, Merrill and HCA). Patrick felt comfortable with Lehman's roles given that the private equity group is a separate group on the other side of the wall. We will continue to monitor this trend and any possible conflicts, at Lehman and elsewhere.
- Several of the real estate deals in the pipeline include a bridge equity component. Bridge equity financing is similar to bridge loans in the acquisition financing world. Financing is provided with the intent to take out the financing with an equity offering. Patrick expressed comfort with this as it is only done for Class A properties. With bridge equity, Lehman starts to line up investors on day 1 and typically half of it is circled by close. ("Circled" means that an investor has given a firm indication that they will purchase the equity. While this is not a legally binding agreement, investors are unlikely to renege as doing so would ruin their reputation.) Compare this with the typical CMBS deal which takes 3-6 months to takeout.
  - "1211 Avenue of the Americas" is a \$915m deal that has been on the firmwide risk snapshot for several months. This financing includes \$300m bridge equity, \$180m of which has been circled. This deal also includes a B-Note component and a CMBS. The deal closed in late August and they are targeting a December syndication of the CMBS.
  - The Gables transaction also had a bridge equity component. [During the CSE review, we saw reports that gave more details about the status of the various deals in the pipeline (in bullet form). I will ask Patrick about the possibility of including these in our monthly package.]
  - The E.On commitment for \$1.718b is the largest non-real estate financing. This is a commitment in support of E.On's purchase of Endessa. This exposure appears in this category because E.On had to prove that they had committed financing for the public tender. Lehman is targeting a December or January close.
  - The CVS commitment (\$407m) includes a \$300m real estate component. Lehman will issue lease-backed notes, and the rest of the commitment will be



a draw under the revolver. This deal is expected to hit the market in November.

- The Avio commitment (\$293m) was a recapitalization. It has been fully syndicated and was well received by the market. Hertz (\$211m) was also a dividend recap. MEG Energy (\$200m) was for a project finance.
- West Corp. (\$1.36bn) will close in 1-2 weeks, and has been fully syndicated now. Lehman's final hold position is projected to be \$50m.
- Following up on the Precision Partners deal discussed last month, Lehman is syndicating the first lien piece now. They restructured the deal to upsize the first lien in order to be able to fully distribute the second lien, which is more risky and generally harder to place. Patrick said that "the market is not loving" auto-related deals, but was not overly worried about this position. For the right price, they would be able to get rid of the first lien. The question is what is their "threshold of pain." That is, should they eat through all their fees in order to distribute this paper, or wait. Currently, they are waiting to see what the market will do.

#### **FOLLOW UP**

- The Risk Appetite limit set in May was lower than the formula would have suggested, leaving Lehman with "headroom." For much of the year, they have operated well under that \$2.3 billion limit, but as RA usage has ticked up rapidly in the current quarter, they are considering increasing the RA limit prior to the end of the year to \$2.6bn. We will continue to monitor the increased risk-taking within the firm.
- Several of the real estate deals in the pipeline include a bridge equity component. Bridge equity financing is similar to bridge loans in the acquisition financing world. Financing is provided with the intent to take out the financing with an equity offering. Credit risk management expressed comfort in the value of the properties utilizing this type of financing, but we will follow up on the progression of these deals in the coming months.

**MONTHLY RESULTS (ED GRIEB, KRISTINE SMITH, TONY STUCCHIO)**

- Revenues bounced back in October to \$1.468bn from \$1.2bn last month on the heels of good equity markets and a stable rate environment. ROE also bounced back to 21.2%.
  - Fixed income revenues were \$623, down versus average month '06 but up significantly from \$558m last month.
    - A major driver of revenue was a \$145 gain on the Formula One position. Lehman has an equity stake in Formula One resulting from a workout loan position. Formula One is doing a dividend recap that will net Lehman \$100m cash. The dividend recap gives product control better observability as to the value of the equity stake, and thus they are revaluing the position resulting in an additional gain of \$45m. In November we may see an additional (~ 40 million) gain from a better mark. The HY desk and Investment Banking will share the gain.
    - Mortgages were down off origination of \$5bn and tighter spreads. BNC is still seeing putbacks of the Finance America product. The putbacks started during the summer and Lehman has been increasing reserves to cover them. In September 2005, BNC and Finance America were merged under the BNC name. Ed attributed the increase in putbacks to the fact that the Finance America name recently went away (I assume that although the official merger occurred over a year the name was just recently changed?) and that Finance America's customers are less willing to hold questionable product because of that. Ed stated that all underwriting conforms to BNC standards and that there were no changes to be made to deal with the increase in putbacks. (This contradicts Gerry Reilly's statements that underwriting needed to be strengthened. Check with Audit at our next meeting in December.)
    - In other FI news, real estate was down due to fewer securitizations and interest rate products was down.
  - Equities revenues were up to \$335m vs. \$289m avg. month '06. Prime services were particularly strong.
  - Investment banking was active as revenues increased to \$293m from \$212m last month. The M&A side was active. Equity origination was up on increasing IPO activity. They are forecasting a strong November, although the large AT&T deal was put off due to regulatory concerns by the FCC.

- Investment Management revenues increased to \$217m. AUM continues to improve with positive inflows during the month.
- Non-US revenues were 27%, down from the more typical mid-30s.
- Net leverage rose to 16.2x, much larger than the typical 13.5x, due to the large number of mortgages remaining on Lehman's balance sheet from the outsized TBA trade discussed last month. Lehman defines net leverage as net assets divided by tangible equity capital. Net assets rose 21% to \$290bn during October. The net leverage ratio will decline as Lehman continues to sell out the mortgages, but they expect the ratio will tick up to the mid-14s on average. This number is closely monitored by the rating agencies, and Lehman has been in discussions with them about the magnitude.
- LBI Excess Capital ended the month at \$4.508bn. LBI net revenues were \$549m and net income was \$211m. Equity in Subs increased to \$86m due to the Formula One position.
- Lehman will be taking some earnings out of Neuberger Berman, and continue to debate whether they will continue to operate NB as a fully licensed broker-dealer.
- Lehman recently invested \$25m in Blue Bay, a UK asset manager. The investment has a 1 year lock up provision. Lehman also increased in stake in Marble Bar, a London hedge fund, to 20%.
- Lehman is taking a 17% stake in Wilton Re, a reinsurer of the mortality risk on life insurance policies written in the US by primary insurers (<http://www.wiltonre.com>). The investment is subject to regulatory approval, and involves a \$100m upfront payment. Depending on performance, the investment could grow by another \$200m (taking Lehman to a 30% stake). As Lehman ramps up its activity in the insurance space, we should take a closer look.

## **RISK APPETITE**

- RA usage continued its upward swing to \$2,136. Fixed income usage was down slightly to \$1,535 from \$1,552 million, while Equities usage was up slightly to \$380 from \$356 million. Investment Management (\$406 million) was up a bit. GTS (risk arb) was up again, at \$366 million. Real estate remained up significantly at \$600 million. The limit remains \$2.3 billion.

## MARKET RISK (PAUL SHOTTON)

- Firmwide VaR was up slightly at \$49 million, from \$47 million the prior month. Fixed income fell slightly (from \$51 million to \$39 million) while equities rose (to \$13 million from \$11 million).
  
- **FID**
  - The overall short rate exposure, across all businesses, increased \$700k to \$2.3 million/bp. The short in the Euro remained relatively unchanged at \$1.5 million. The short in the Yen was also unchanged at \$600k, and the short in the US dropped slightly to \$160k. Lehman had very slight longs in the Zloty, Mexican Peso, and CAD.
  - After a reduction last month in rate vega, the desk ended the month up at \$49 million/vol point, up from \$34 million at the end of last month. The increase was led by the US and Europe – and more specifically by IR products Europe and LMP Europe. In general, implied vols continue to remain at historical lows. The long vol position is counter to Lehman’s net short bias, but the desk does not want to be structurally short.
  - We asked about John Hoffman, a trader who Gerry Riley mentioned (apparently, he has generated about \$1 billion in trading profits over the last five years or so). John sits within US LMP, and it sounds like he effectively is LMP, or at least generates the vast majority of their revenue. He runs the long futures short cash position that we often hear about – his trades tend not to generate huge amounts of risk as they are basis trades. He also trades around the swap spread.
  - FX delta was more or less flat last month (\$13 million), and this month the desk tended to be long currencies versus the USD (overall delta up to \$210 million). While some of the exposure was in the G10 (with \$190 million of that in the Yen, short \$100 million in the GBP, and the prior short on the Euro (\$200 million) was flattened out this month (to \$19 million)), much of the delta was driven by other countries – larger positions included HKD, BRL, KRW, MEP, and RUB. Paul noted the last month there was a flight to quality, resulting in the unwind of the carry trade, but that in October the carry trade was aggressively back in place. The desk was very bullish on Ecuador, and took losses on this position with all of the election uncertainty. Lehman tends to have a net short bias in EMG since the spreads are so tight. I have in my notes that Paul said that FX vega was up at \$14 million/vol point, but the report shows it at \$8.7 million (basically unchanged from last month).
  - Credit spreads tightened, and swap spreads tightened at the short end – this was for a few reasons.
    - Views that the Fed will stand steady
    - Treasury warnings about short squeezes in the repo markets – fewer Treasuries are on special now

- HY spreads continue to grind tighter, with many people preferring the indices as it is easier and quicker to take a position on spreads. The long credit exposure declined from \$1.6 million/bp to \$203k/bp (at one point going to an outright short on the back of spread tightenings). The US HG business did end up slightly short, a major reversal from being long \$2.9 million last month.
- We spoke briefly about CPDOs, which allow leveraged investments in highly rated structures. Paul said that he thinks these are overblown in the media.
- The reduction in division-wide VaR came despite a rise in the Energy VaR from \$3 million to \$9 million, driven by one large power trade. The low correlation of the energy business to other FID desks meant that this increase did not significantly affect the overall FID VaR.
  - Tenasca bought six plants from Constellation through some sort of private equity entity, and wanted to execute hedges in order to lock in cash flows.
  - The desk entered into a five year, 700-800 mWH tolling option deal with Tenasca, a generator in the Texas South (ERCOT) market. Lehman effectively bought a heat rate call option, paying a premium for the right to purchase power at a fixed rate (Lehman gets the physical power and settles the gas contracts financially). When spark spreads widen, the deal makes money for Lehman and technically, the plant is also in the money (right-way risk argument). The standalone VaR on this trade was \$12 million – subsequent hedging has brought that down to \$9 million. Day 1 P&L was \$12 million.
  - I noticed that in the energy VaR packet Lehman appears to be trading in both the agricultural commodity and emissions trading spaces. Both areas have very small positions, but I don't necessarily remember hearing about this, although it's been going on for at least a few months. We might want to follow up with Paul and Laura.

- **Equities**

- The long delta increased from \$1.4 to \$1.9 billion. The increase was across all regions, and reflected a general long bias conviction. Long vega fell slightly from \$26 to \$23 million, and the long gamma fell as well (from \$825 to \$644 million).
- There was a big increase in block trades, which continued into November. Sponsors and others have seen the strong market as offering a good opportunity to unload positions, sometimes at aggressive prices. Although discounts are widening out again (good thing from Lehman perspective), Lehman has sometimes been bidding to miss. Successful bids include:
  - \$1.1 billion in RH Donnelly (at time of meeting, \$200 million left)

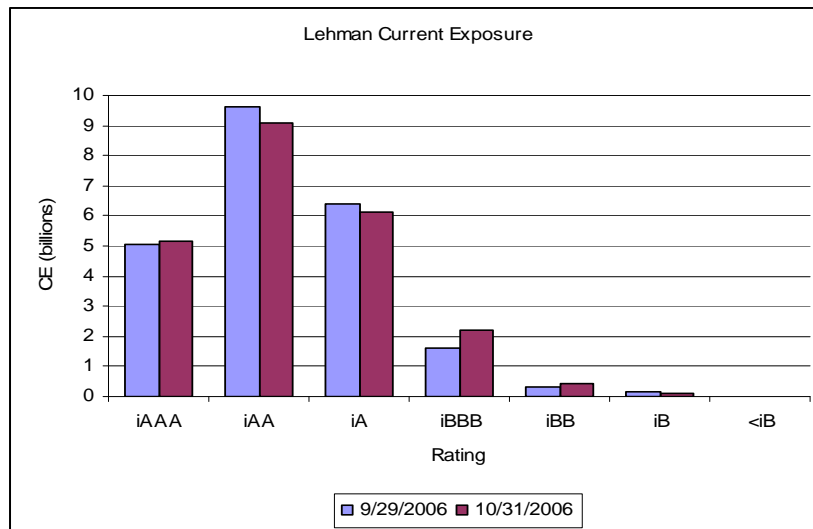
- Two others, one at \$750 million and the other at \$117 million (didn't get the names). Both were easily placed.
- **GPS** increased its VaR from \$4.8 million to \$6.2 million, as they increased their positions in Adelphia and continued the GM trade (long protection in the equity tranches versus short protection on indices).
- **Investment management** saw its VaR increase from \$5 to \$6.05 million, actually breaking its limit of \$6 million. This was due to three factors: warehousing in the FoF business (what is this?), capital calls for real estate investments, and seed capital in funds.
- **Backtesting results**
  - There was a violation in equities portfolio, caused by a blind risk basket.
  - GTS had a violation resulting from a risk arb trade (ATT and Bellsouth), occurring when the FCC delayed regulatory approval.
  - Munis had a violation due to the lag in the muni-treasury basis (the usual story for exceptions in this area)
- **Scenario Analysis**
  - The worst case stress loss again comes from the Equity Crash, but the actual loss is way down from last month, at \$1 billion (compared to \$1.8 billion last month). The decline in credit spread positions helped cut the losses, with long spread exposure 2/3 of what it was last month (most losses within FID occur due to spread widening). For example, last month FID lost \$600 million in this scenario, and this month they only lose \$263 million. We asked Paul if this sort of dramatic decrease generates any internal discussion, and it seems like the short answer is no. He again reiterated that senior managers look at these numbers, but I didn't get the feeling that they really use them for anything other than a gut check. We'll keep following up in this area.
  - The second-worst loss was \$963 million, from HY and LBO default scenario (a scenario not on the top-three list last month). FID drives the losses here, with \$418 million.
  - Third-worst is Black Monday, at \$799 million (down from \$1.5 billion for this scenario last month). GTS leads the pack with losses of \$272, primarily from its long \$1.3 billion in equity delta (again, last time FID generated the most losses in this scenario).

**CREDIT RISK (STEVE SIMONTE, PATRICK MCGARRY)**

- The pipeline of deals by bucket is as follows:

Bucket	10/31/06	9/29/06	8/31/06	7/28/06	6/29/06	5/31/06	4/28/06	3/31/06	2/28/06
Conditional deals	10,073	9,254	9,601	7,894	10,330	8,915	7,539	8,512	10,541
Contingent	3,204	2,958	6,102	2,045	1,600	1,473	1,231	603	1,878
Mandated, committed letter	10,444	15,031	14,052	15,234	11,879	13,628	12,672	10,268	4,407
Mandated, final docs	14,496	12,114	12,325	10,933	12,482	8,393	9,149	7,127	6,118

- The Agent Lender Disclosure project was largely completed at the end of October. Principal CE rose from \$18.673 to \$20.921bn, while agented CE fell from \$4.504 to \$2.266bn. The agented CE exposure that remains is in Europe, and a similar disclosure project is starting which will eliminate that amount. Lehman has \$154bn securities borrowed, and of that amount \$123bn has been allocated. The project required mapping exposures from 29 individual banks to 4,530 lenders. The top ten borrowed a total of \$39bn and generated \$0.5bn in CE. Top lenders included the Central Bank authorities from Mexico, Saudi Arabia, Japan, and China, as well as pension funds such as the State of North Carolina. Often, Lehman saw the same principal lenders coming from multiple agent lenders. Lehman receives feeds from the DTCC and uses Sunguard software to facilitate receiving the feeds.
  - Lehman's policy is to rate counterparties if the exposure is greater than \$1m. Most of the principal borrowers that required ratings were rated, and Steve Simonte has instituted a month-end control process to ensure that counterparties needing ratings get rated. The impact on CE by rating is shown in the following graph. Most agent lender banks were rated AA or A, and thus these categories see a decline in CE. Principal lenders were generally rated AAA (some central banks) or BBB, and thus these categories see an increase in CE.
  - Lehman felt that overall although this activity is low risk, the project was good for transparency purposes. One agent lender (GES) was non-compliant as of the end of October, but expects to become compliant in a few months.



- The top CE names were the usual suspects. Steve did not provide any additional cuts of the data (top MPE, top energy exposures, top hedge fund exposures), and we will follow up before next month's meeting to ensure that that information is included in next month's package.
- A regional chief credit officer for London has been hired and will start on 12/4.
- The Tenaska deal (see above) was the first structured transaction in the commodities space to generate significant credit exposure. Lehman has purchased a heat rate call from Tenaska, so that they effectively have the economics of the operating power plant. Lehman pays a premium to Tenaska for the right to purchase the electricity generated by the plant on a periodic basis over the next five years. The MPE, which results from the reliance on the plant to deliver electricity, is \$172m.
  - Several credit risk mitigants are in place to protect Lehman on this trade. They were able to secure a first lien security interest in the plant. This is unusual, given that Lehman was not involved with the financing (CS provided the financing). The usual claim would be part first lien and part second lien. In addition, they purchased contingent CDS protection. The protection is contingent in that the notional amount varies based on a generic heat rate call trade. While the protection amount increases as the MPE rises, the overall amount of protection is capped at \$91 million, leaving Lehman with a second-loss piece of \$87 million (Steve provided these numbers, but they actually add up to more than the \$172 MPE number we were given).
  - A tolling agreement such as this leaves Lehman exposed to the operating risk of the plant. Several mitigants are in place to deal with this risk. Lehman receives independent engineering reports to review the value of the plant. Production is not ringfenced around one particular plant, but rather six plants. In addition, Lehman bought outage insurance.



- We will ask Peter Galbraith, the credit analyst for commodities, to discuss the deal at the next monthly meeting.
- Patrick provided color on the markets. Markets are going well as evidenced by the fact that the large HCA deal priced better than expected. There had been capacity concerns with the large volume of deals coming to syndication, but investors are absorbing deals well. With all the liquidity in the market, borrowers are becoming more aggressive. They have seen a reemergence of covenant lite structures, and Lehman always tries to build in flex to at least one covenant. Going forward, there are large transactions in the pipeline, either auctions or take private deals.
- The latest Windermere CMBS will be issued in November. Windermere IX will have underlying German multi-family collateral, and another Windermere will include properties more broadly. Patrick will update us on the specifics of the transaction next time. Commitments that will be included include:
  - Region of Campania (\$1,402m)
  - 1211 Avenue of the Americas (\$915m)
  - Woba (\$765m)
  - 520 Madison (\$600m)
  - Extencicare (\$500m)
  - German Office Portfolio (\$478m)
- Some additional color on specific deals include:
  - Formula One (\$1,575m conditional commitment) is expected to close next month. The deal, both in total and Lehman's portion, has recently been downsized.
  - The CVS commitment (\$407m) includes a \$300m real estate component. Lehman will issue lease-backed notes, and the rest of the commitment will be a draw under the revolver. The deal priced this week.
  - The Hertz (\$211m) dividend recap will be taken out fully with the IPO.
- Precision Partners remains on the commitments schedule with a \$136m commitment. Lehman is comfortable holding this position as they believe the market is undervaluing it. We will continue to monitor this exposure.

#### **MORTGAGE RETAINED INTERESTS**

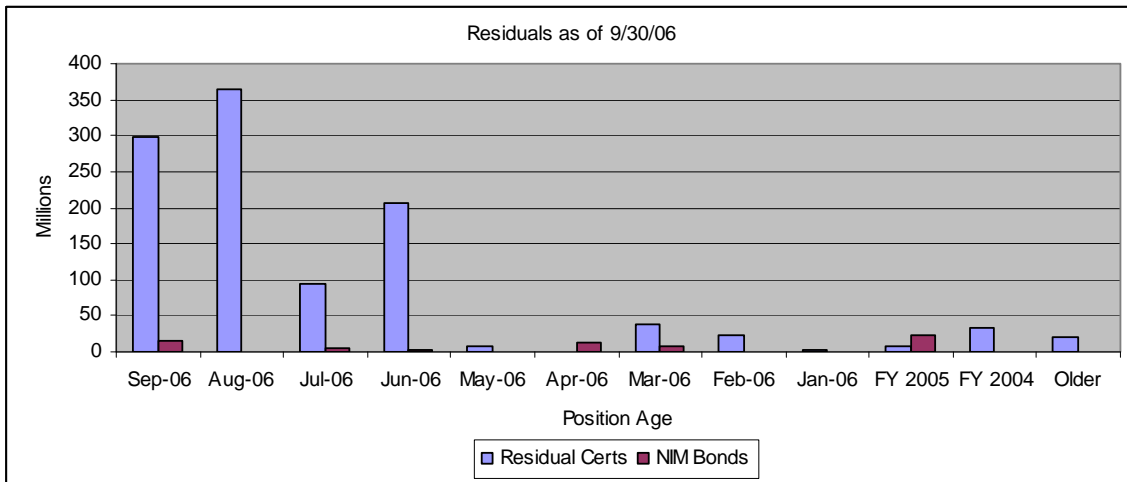
- We requested an overview of mortgage retained interests at Lehman, given the increasing size of the position over the past few quarters.
- Richard McKinney, head of Prime Mortgage Trading, and Matthew Miller, head of Sub-Prime Mortgage Trading, provided an overview of the mortgage market generally.
  - A predominant theme in mortgage lending now is excess capacity, especially in subprime. The situation is exacerbated at Aurora, which does not originate

option ARMs, the most popular product currently. In a desire to create volume, the possibility exists to loosen standards and create bad loans, but (of course) that has not happened yet at Lehman's subsidiaries. Production has declined from \$ 52 bn in 2005 to \$35bn in 2006. Aurora and BNC have undergone layoffs during the past year, and Rich expressed the view that Lehman's originators were "right sized" now. Aurora is targeting originations of \$37 billion for 2007.

- On the issue of mortgage performance, Lehman is seeing its wholesale loans outperform its correspondent loans. Wholesale loans (35% of total loans) are sourced from brokers and closed in Lehman's name, whereas the correspondent loans are closed in a mortgage bank's name. The problem is delegated loans, where the underwriting is performed by the correspondent on a "Wall Street style underwriting." The performance of the tails of production, Alt-B and Option ARMs, have particularly worsened. They stated that there are fundamentally worse loans in the market right now, but that is not necessarily bad if they can be valued properly.
- Rich also noted that there really isn't money any more in leveraging the rate risk inherent in mortgages – to make money now, you have to trade the credit risk. He said that hedge funds have built out teams aimed at doing just that, and have hired the relevant traders. He also said that relative value trading has increased with the ability to go short the credit risk (I think he said that this occurs more in the subprime than prime space, though).
- In the subprime residuals space, Lehman fundamentally changed their business model in June 2006. The traditional residual strategy was to take the volume of loans securitized, put on mortgage insurance to protect cash flows, and create NIMs. It was basically a story of "arbitrage execution." This year, the business made a conscious shift in strategy. Partly, this was due to the fact that the market is more developed with more buyers, although it is certainly not a liquid market. They are utilizing less mortgage insurance and keeping them on the books for 3-6 months to allow for seasoning. In addition, they decided to buy seasoned third party residuals in order to get more exposure to collateral. The business fundamentally believes that the residuals they have on their books are cheap and could not be purchased at those prices in the market now. Thus, they want to own them.
  - A challenge facing the subprime desk is that First Franklin, its largest source of subprime collateral, was purchased by Merrill Lynch in September 2006. Lehman is still purchasing loans from First Franklin, but they expect the flow to stop after they are fully integrated with Merrill. The desk plans to grow the production at Lehman affiliates in addition to seeking other third party sources of loans. In addition, another of Lehman's large suppliers, Option One, is currently for sale, and it is unclear what will happen to this source in the long run.
  - A second challenge facing the subprime desk is that Amaranth had been their largest purchaser of residuals. Amaranth sold \$550m of resids in a fire sale (10-15% below market) and Lehman took the fact that they were able to sell

the product as a good indicator of the value of their resid. (but at what price were they able to sell??)

- Within the prime space, 90% of the residuals are coming from option ARMs. The desk has sold ~\$700m this year and currently has ~\$500m on the books.
- The following chart shows the composition of RMBS Non Investment Grade Retained Interests as of 9/30/06. The trend is clearly to hold more residuals beginning with the June 2006 vintage, reflecting the new strategy. As of 9/30, the total amount of residual certs is \$1.105bn and the total amount of (non-investment grade) NIM bonds are \$64m. [clarify the difference between these 2 categories. I assume that NIM bonds are the rated part and residual certs are unrated.]



- Another chart shows the amount of Residuals (defined as “Generally contains the non rated / non investment grade equity or excess spread classes of Lehman shelf securitization”) is \$1.191bn as of 9/30 and the amount of NIMs (defined as “Securitizations of Residuals classes of Lehman shelf name securitizations. Generally contain investment grade and non-investment grade tranches) is \$356m as of 9/30. [Reconcile the residuals number here with the number above. NIMs difference due to IG/NIG. Clarify if third party sourced residuals, which they said they are now purchasing, are included. Also, reconcile the numbers in the chart on page 6 of the presentation which shows ~\$1.3bn rated subordinate retained interests, ~1bn unrated, and ~\$300m new issue across both prime and subprime.]
- Jeff Goodman walked us through several reports that are used to risk manage the mortgages positions, and the residuals position specifically.
  - One (undated) report shows prime non-agency exposure by rating (\$3.9bn total market value of exposure, with \$684m exposure from resid (non-rated bucket)) The exposure is hedged with TBAs, swaps, and eurodollar futures.
  - We also saw a spread widening stress scenario for subprime product. Currently the net spread losses are \$181m for all subprime product. The residuals are also stressed by changing prepayment speeds ±10%, rates

$\pm 50\text{bp}$ , and loss severity  $\pm 25\%$  and  $+50\%$ . The max loss across all scenarios was \$116 for loss severity  $+50\%$ .

- James Guarino and Joseph Sapia from Product Control discussed valuation. Almost all residual positions are price tested via cash flow analysis using Intex. Loss and prepayment assumptions are based on historical information as provided by Intex. New issue deals with little or no collateral experience are price tested using pricing speeds and rating agency loss assumptions. NIM bonds are price tested using LehmanLive Single Security Analytics tool.
  - Residuals are priced very conservatively. The desk's view (somewhat against the norm) is that they P&L recognition once the risk is gone, meaning the residuals sold off. They prefer to keep the positions marked low because they do not want to have losses later.
  - We asked if these reports had been prepared specifically for us, or if they already existed. Both PC and Risk both adamantly stressed that they run these reports on a regular basis, and that the residuals are a major source of focus for senior management.

#### **FOLLOW UP**

- The energy business recently executed a large power trade in Texas, resulting in a standalone deal VaR of \$12 million and MPE of over \$170 million. This is by far the largest trade that the business has engaged in since its inception, and we will continue to discuss the market and credit risk management of this position.

**MONTHLY RESULTS (ED GRIEB, TONY STUCCHIO)**

- November was a very strong month, with net revenues of \$1.9 billion.
  - Capital markets had a record month – while Fixed Income did not have a record in terms of revenue at \$932 million (I believe it was the second highest though), it did have a record month in terms of sales credits. Equities was at \$361 million, above the average month 2006. Investment banking had record revenue at \$354 million, and investment management had an increase after the \$20 million additional investment into Marble Bar, which caused the original investment to be marked up. AUM were up to \$225 billion.
  - Securitization volume picked up in Q4 overall, with \$41 billion in volume (versus \$35 billion in Q3). The IPO market was strong, as was M&A (with the Golden West – Wachovia deal closing). Both HY and HG debt origination were strong as well. The pipeline at the end of Q4 down from end of Q3 levels, as much of the Q3 pipeline was realized during Q4.
  - Non-US revenues for the quarter was at 34% - Asia's contribution was down slightly, while Europe had a record quarter.
  - Lehman continues to evaluate the future of LOTC – whether they put more business into the BD-lite or whether they shut it down (it's still too punitive to put customer businesses in there). LOTC currently has \$125 million of excess capital, which is a decrease due to the incoming migration of the EMG Brady options business.
  - Net leverage came in at 14.5x, right on target. The big mortgage position is now off the BS, and overall mortgage inventory was lower due to high securitization volume.
  - LBI went ahead with a \$700 million dividend to LBH, which had a \$300 million net effect on LBI (I believe the rest of it came from LBI subs). There was also a \$100 million dividend from the Neuberger broker-dealer, and a \$55-70 million from the (?Neuberger) management companies. As mentioned previously, the clearing business is being sold to Pershing, and Lehman is still unsure about what they will do with the Neuberger B-D.
  - Principal investments
    - Project Kite: Lehman is taking a 20% stake in DE Shaw, the management company. This is sort of a JV between Dave Goldfarb and IM. They will play a passive role in the management of DE Shaw's funds, but hope that this might enhance their relationship with DE Shaw and allow them to deals alongside DE Shaw (I think ala Goldman private equity groups and pick-your-hedge-fund, whenever they acquire something).

- Project Sail: Lehman is going to take a 25% stake in Spinnaker, another HF management company. Both of these acquisitions went through SARC, the strategic acquisition committee.

## **RISK APPETITE**

- RA usage was basically unchanged at \$2.1 billion. Real estate was up slightly, from \$600 to \$612 million. Investment management was also up slightly at \$467 million, from \$406 million last month. Prime Services and GPS were broken out for the first time – I’m not sure where they lived before (ostensibly in Equities and FID, respectively).

## **MARKET RISK (JEFF GOODMAN)**

- Firmwide VaR was up slightly at \$53 million, from \$49 million the prior month. Fixed income drove most of that increase, at \$42 million from \$39 million, while equities fell slightly (from \$13 million to \$10 million).
- **FID**
  - Market color: Inflation data came in below expectations and the market rallied. Continued Fed worries about inflation caused the market to fall again, and a January rate cut is no longer priced into Treasuries. During the month, the 2-10 year part of the curve was still inverted. Swap spreads tightened, and autos came in between 40-60 points despite Kerkorian’s actions. Equity markets were flat to slightly down across most markets, and FX continued to be bearish with respect to the dollar (Lehman was short versus both majors and EMG).
    - Thai baht: the Thai government wanted to stop the baht appreciation and effectively installed capital controls, causing the markets to fall 20% in a day. With respect to Thailand, Lehman is net short equity, baht, and credit spreads (although on the FX page, they really look flat). They have exposure through real estate, loans, and some NPLs – but all are grandfathered into the “pre-rule” stage. They are currently looking at some new deals, and factoring in the new 30% withholding requirement. Jeff felt that there was very limited EMG contagion from this event, as investors continue to become more sophisticated and realized the idiosyncratic nature of this event.
  - The main drivers of the division VaR increase were liquid markets prop, high yield, and munis.
    - LMP saw an increase of their calendar trades
    - High yield funded the Formula One positions (close to \$1 billion), which has since been sold down to \$300 million. Syndication will

- begin in January (RBS has 2/3 of this deal – ostensibly \$2 billion).  
(see below in credit risk writeup)
- Munis took more spread risk.
- Energy had a sizable VaR decrease (from \$9 to \$6 million), as they finished hedging the Tenasca deal. Hedging was completed within the 2 weeks initially planned. We also learned that there is some limited emissions trading coming from Europe, and that there is now someone working solely on establishing commodity and energy time series, working for Eduardo.
  - IR Products vega was up again, at \$44 million from \$28 million. These positions were mostly in medium and long term vega, still at very low levels. During the month, there was a slight uptick in short end (3 month into 10 year) vega.
  - HG credit flipped from basically flat to long credit (2.5 million) in the Americas, driven by the Yankee book increasing its exposure to \$350 K/bp. HY Europe also increased its long credit exposure, due to the Formula One position. High Yield also made over \$80 million on its Delta position following US Airways' takeover offer.
  - EMG took off some hedges prior to a position unwind, caused VaR to move up slightly (\$3.6 to \$4.1 million)
  - Mortgage market update: Housing starts have been down 15-18%, and house price appreciation looks like its going to come in at 3.6% this year, and possibly lower next year (Jeff mentioned that we haven't seen 0% appreciation in a long time). Lower-rated tranches are running into trouble as sub-prime delinquencies rise, with problems showing up already in the early 2006 vintages – these included borrowers who were making a “last grasp” before rate increases, and may have had a very low payment for just one month. There are 2 2006 vintages in the ABX index, which have driven the big move in spreads. Jeff mentioned that the index can move 75-80 bps in a week, and still tends to trade thinly (i.e. a few 200-300 million positions can move the market). He also said that spreads were tending to move more in the synthetic rather than cash world, with cash lagging synthetics (as you can't short the cash product, desire to hedge during the month is doing with synthetic, and when securitization products come out the cash products will then move in the same direction).
    - We discussed EPDs, and whether or not they could increase without fraud being involved. Jeff agreed that fraud plays a big role, and that it tends to involve the appraiser, lawyer, and closing agent working in cahoots. However, he also said that some people

truly can't afford their mortgages and can be quite financially unsophisticated, and may have an affordable payment for only one month and then face a big increase – so this would be a more “legitimate” reason for EPDs.

- Lehman has increased its pricing on 80/20 mortgages to effectively decrease production, as they tend to be wary of this product (BNC originates subprime 80/20s)
- Whole loan execution is still good, with decent prices.
- The NPC (Lehman-wide, or mortgage specific?) has approved the origination of hybrid option-arms, i.e. negative am mortgages. These will be Alt-A borrowers (650 and up), with five years of fixed payments (i.e. no reset for 5 years). The negative am is capped at 110%, and the buyer must qualify at the fully indexed (110%) rate. Also, the loan is an IO for 10 years, which is apparently also conservative. The big push for these products is in the California market. We did ask about this approval, as Laura told it about us literally moments after Jeff gave his rather gloomy state of the mortgage market, but she said that it was relatively conservative (as much as option ARMs can be conservative) and had gone through thorough review. Jeff mentioned that they paid particular attention to the disclosures given to borrowers, which clearly state how much the payment could potentially increase. Jeff mentioned that it's not necessarily a crisis if a product has higher defaults, as long as they are pricing it correctly. He did note that you don't want products with 20-30% default rates, as that shows huge suitability issues and is generally not a good idea. Jeff also noted that option arms tend to be cheaper than subprimes, and Lehman takes the opposite view (i.e. they think the market is not pricing that correctly).
- Lehman has limited exposure to the originators currently in the news (Ownit, Seabring, MLN – they have some reps and warranties that have been put back to MLN). Jeff noted that the subprime origination model is not necessarily bad if you can weather liquidity crises, which some firms have obviously not been able to do. Lehman currently has \$6bn in warehouse lines to subprime originators, with 40-50% funded. Once per year, they audit the collateral in the lines.

- **Equities**

- The long delta increased from \$1.9 to \$2.1 billion, but division VaR fell because of reduced volatility exposures (see below).
- Volatility flow saw a decrease in VaR, from \$7 to \$3.4 million. This was driven by a decreased exposure in S&P index volatility.



- There were 12 block trades in the month, and all went well. The remainder of the RH Donnelly position was placed (last month \$200 million remained from a \$1 billion deal). Other deals in November included SC Green (\$500 million), TRW, Parker Drilling, and Genworth (\$1 billion).
  
- **Backtesting results**
  - IR products had a backtesting exception due to a series of vega trades which lost money when vol came down mid-month. .
  - Equities global had an exception when the S&P was down 3.7% and the Stoxx was down 1.4% (they were net long \$2 billion at the time).
  - Equities cash products also had a violation (I believe on the same day), and their \$73 million restricted NYSE position was also affected.
  - Equities event driven had an exception due to some name-specific equities (Unisys, RPC)
  
- **Scenario Analysis**
  - The worst case stress loss again comes from the Equity Crash, but the actual loss is way up again (at \$2.2 billion, up from \$1 billion). This is coming primarily from the HY and equity business, where both the credit and delta exposures are larger than last month. Also, exposure in more credit sensitive names has risen. We'd been told that these numbers might garner more attention when they began to approach the RA limit (\$2.3 billion). This would have seemed to reached that benchmark, but Jeff more or less reiterated that they were interesting not but not particularly crucial to risk management's daily processes (i.e. we asked outright if these were being done solely to humor us and the response was "and other people.") Jeff thought they would get more attention if they reached a level closer to \$4 billion. It seems odd that the scenario loss could move by so much when VaR moved comparably little. [Seen this at Merrill due to negative gamma, where the 4 years of historical time do not show large moves, compared with the assumptions in the scenarios]
  - The second-worst loss was \$1.65 billion, from HY and LBO default scenario. FID drives the losses here, with \$800 million.
  - Third-worst is Black Monday, at \$1.57 billion. FID and Equities both generate around \$500 million of losses, and GTS contributes \$300 million.
    - Jeff pointed out that the size of the shock can have a big effect on a business such as FoF derivatives, where Lehman is essentially providing gap coverage. In the equity crash, the FoF business loses \$290 million, whereas in the Black Monday scenario the business only loses \$25 million.

**CREDIT RISK (STEVE SIMONTE, PATRICK MCGARRY)**

## Commitments (Patrick McGarry)

- The pipeline of deals by bucket is as follows:

Bucket	11/29/06	10/31/06	9/29/06	8/31/06	7/28/06	6/29/06	5/31/06	4/28/06	3/31/06	2/28/06
Conditional deals	17,165	10,073	9,254	9,601	7,894	10,330	8,915	7,539	8,512	10,541
Contingent	5,602	3,204	2,958	6,102	2,045	1,600	1,473	1,231	603	1,878
Mandated, committed letter	8,221	10,444	15,031	14,052	15,234	11,879	13,628	12,672	10,268	4,407
Mandated, final docs	13,538	14,496	12,114	12,325	10,933	12,482	8,393	9,149	7,127	6,118

- The level of pipeline risk was about the same, but several of the names have changed. Patrick described the markets as having “relentless demand.” With that said, several big commitments are scheduled to hit the market soon (HCA, Equity Office, Kindermorgan). Lehman’s forward calendar was down a bit.
- Highlights of non-real estate related transactions include:
  - Penn National (\$6.35bn, 33% probability) is acquisition financing for Penn National’s purchase of Harrah’s Entertainment. Several banks had backed TPG/Apollo’s bid for Harrah, who will be conflicted out of the process should that bid fail. Lehman teamed with Wachovia to provide a bid, with Lehman providing 25% of the financing. The total financing package is \$25.4bn, with a \$6.5bn bridge.
  - Mirador (\$950m, 50% probability) was acquisition financing for Mirador’s bid for Mirant, Philippine power plants. The main financing traded away, but Lehman will participate in the backstop to the Japanese bank financing the project. This is the first large project finance that Lehman has bid on in emerging markets.
  - Domino’s Pizza (\$1.225bn, 33% probability) is a securitization bridge commitment for a recapitalization.
  - Region of Campania (\$1.446bn) was scheduled to fund the week of our meeting. This commitment is for the restructuring and refinancing of debt of the healthcare system of the Italian region of Campania. The region will purchase health care receivables, put them into an SPV, and issue long term bonds. In August, S&P put the region on credit watch. A condition for the funding was that they be A- stable. S&P has cleared them, but there has been some noise in the region from disgruntled employees. We will continue to monitor this transaction.
  - BAWAG (\$842m, 20% probability) was the Austrian bank that had problems with Refco. The commitment is for acquisition financing for a Cerberus led bid for BAWAG. Cerberus won the bid and Lehman is working through this deal.

- Tenaska Power Fund (\$165m, 90% probability) is acquisition financing for Tenaska's purchase of six nat gas fired plants from Constellation. The acquisition price is \$1.65bn. Lehman also provided a heat rate call option in order to hedge the Portfolio's output, and came into the financing part of the deal at the last minute.
- The E.ON (\$1.668bn) commitment for acquisition financing for E.ON's purchase of Endesa remains on the list. E.ON's bid was approved by Spanish regulators with several conditions, which were ruled illegal by the EU. They are waiting on a response from the Spanish government.
- Formula One Group (\$973m) was for a dividend recap financing package for Formula One. Lehman has a 14.3% ownership stake in the business and will thus receive \$340m from the recap. The total financing package was \$2.95bn, \$300m second lien and \$350m mezz.
- TIM Hellas (\$1.759bn, 33% probability) is for stapled financing package for Apax and TPG's sale of the Hells group. This is a "best efforts recap," in that Lehman is not obligated if they cannot sell it in the market.
- Highlights of real estate finance includes:
  - The Woba (\$765m) and GSW (\$898m) commitments came off the Mandated list. Both of these deals were for German multi-family properties in Dresden and Berlin, respectively. The properties were included as collateral in the Windermere CMBS transaction last month, which sold well. We asked about any concerns with collateral concentrations in East Germany, but Lehman felt that problems were more in small cities rather than Dresden and Berlin.
  - The CarrAmerica transaction (\$2.678bn, 95% probability) provides an acquisition financing commitment to Tishman Speyer to purchase Washington, DC area commercial property from Blackstone. Lehman put up \$560m to Blackstone as deposit money. This deal, which should close in mid-December, consists of \$1.225bn senior debt, \$923m bridge equity, \$355m term loan, and a \$175m revolver. Lehman will look to syndicate the bridge equity immediately upon closing. The IG portion will be allocated to the next 2-3 CMBS deals. The intention is to sell the term loan and revolver. Given the chunky nature of this exposure, we will monitor the developments closely.
- Large deals that have gone away include:
  - Broadway Partners
  - 60 Wall Street
- Questions for next meeting:
  - Lehman has suggested a "Whole Business Securitization" for the acquisition financing for the LBO of Aramark. Get details of this type of financing.
  - Several transactions say that Lehman's commitment is to be a certain funds no-MAC basis. Clarify that this does not mean covenant-lite.

## Counterparty Credit Exposure (Hector Kreuntz)

- Current exposure increased from \$23.186bn to \$25.740bn. The top exposures were the usual names, with CE coming from exposures such as overcollateralized stock loans.
- We received the top non-IG clients by CE and by MPE. Names include:
  - Core Labs (CE \$71m, MPE \$315m) is an oil services company. The exposure is coming from a call spread on a convertible deal (like Amgen at Merrill).
  - CMA (CE \$37m, MPE \$64m) is a shipping company. Exposure comes from fuel hedging.
  - Brasil CB (CE \$33m, MPE \$46m) is repo-related, due to a need to overcollateralize with central banks.
  - Vanguard (CE \$31m, MPE \$55m) exposure comes from interest rate caps sold by Vanguard.
  - Virgin Atlantic (CE \$15m, MPE \$26m) exposure comes from their FX hedging strategy.
  - Lehman Brothers Real Estate Partners (CE \$41m, MPE \$46m) and Lehman Brothers Real Estate Partners II (CE \$12m, MPE \$33m) exposure comes from FX hedging.
  - TPF Generation Holdings (CE \$7m, MPE \$176m) comes from the Tenaska trade. We will follow up on this with Peter Galbraith.
  - Many of the top non-IG client by MPE are hedge funds with flat CE and MPE coming from derivative positions.
- The top energy exposures by MPE include:
  - Canadian Natural Resources (CE \$52m, MPE \$137m) exposure from production hedges. This exposure is hedged through Lehman's CVA desk.
  - Hess Corporation (CE \$0m, MPE \$62m), EDF Trading (CE \$24m, MPE \$43m), and Accord Energy Limited (CE \$19m, MPE \$29m) exposure comes from gas trading.
  - American Municipal Power-Ohio (CE \$0m, MPE \$30m) exposure comes from power trades.

## **FOLLOW UP**

- Risk management has been closely monitoring the performance of Lehman's two mortgage subsidiaries, Aurora Loan Services and BNC, during this housing market downturn and subsequent challenging origination environment. Both subsidiaries originate Alt-A and subprime mortgages, and Aurora also acts as a primary and a master servicer. During the first week of February, we will visit these subsidiaries to discuss their origination platforms and servicing programs.

**MONTHLY RESULTS (ED GRIEB, TONY STUCCHIO)**

- November was the third strongest month, with net revenues of \$1.7 billion (up 15% compared to average month 2006).
  - Fixed income, while strong, had both winners and losers. Credit products did well with the spread tightening, and liquid markets were up 25% on the back of FX prop and the customer flow business. Securitized products were down in December (down 50%), and margins continued to be compressed. However, prime origination was up 13% versus avg month 2006, and non-prime origination was up 4%. Real estate revenue was down due to timing issues – i.e. there were no CMBS securitization deals during the month.
  - Equities revenues were up 50% versus avg month 2006, with cash products posting good customer flow results. Also, equity strategies did well on a few positions (CVS, CarMatrix). Equity sales credits were strong.
  - Banking also had revenue up (6%) compared to avg month 2006, with M&A up 8%. The ATT/Bell South deal was completed with \$20 million of revenues. Equity origination remains well, while debt origination revenues were up, with IG particularly strong in December. The end-of-month pipeline stood at \$763 million.
  - IM had a strong month, with AUM up \$5 billion in December (this increase was due to inflows rather than appreciation).
  - Non-US revenues was up 13% on avg month 2006, driven mostly by Asia which was up 40% (driven by capital markets – IRP and equity strategies/Ben Fuchs). Europe was only up 2%, driven by equities cash and flow.
  - LBI's excess capital was down slightly, to \$3.9 billion, due to finance charges associated with central banks, resulting from reverse repo activity. In addition, \$300 million of sub debt matured, bringing excess capital down to the \$3.7 billion range. Lehman has no plans to replace this sub-debt.
  - We also walked through a “Lehman Brothers – Regulatory Review Fourth Quarter 2006” presentation, which discussed changes in capital, both at the holding company and associated entities. At LBHI, capital increased due to firm profitability, and increased market risk charges were driven by VaR charges in HG and HY inventory positions and Reg Y charges from the CDO, HG, and HY businesses. Credit risk chargers increased due to corporate loans in Europe (e.g. Formula One), among other reasons. There were also “other assets” charges relating to fails on Brady and

Nigerian Oil Warrants (the exchange is apparently looking into the oil warrants problem, trying to get dealers to close out positions).

## **RISK APPETITE**

- RA usage was up to \$2.6 billion, up from \$2.1 billion. Real estate was basically flat at \$597 (more or less unchanged for the past three months). 2007 limits were finalized, and the next risk appetite is \$3.3 billion, a sizable increase from 2006's limit of \$2.3 billion (and 2005's limit of \$2.1 billion). The VaR limit is up as well – now at \$85 million, with FID at \$75 million and equities at \$35 million. Limits will be backdated to 12/1, so the limit breaches seen in December will no longer be true limit exceptions (which seems rather odd – why?). Also, this attitude extends to credit – when Steve mentioned that exposure to IG counterparties is now 98%, up from 97%, he said that this was a movement in the wrong direction, and that they wanted to get the number down. We did ask about this large increase in RA, and associated limits, and everyone said that they were comfortable with this as Lehman's equity base has grown and they want to take more risks (a story we heard last fall after the Deer Valley offsite). There was direct mention of being more like Goldman Sachs.

## **MARKET RISK (PAUL SHOTTON)**

- Firmwide VaR was up significantly at \$63 million, driven primarily by an increase in equities (from \$10 million to \$27 million). FID was down slightly, at \$35 million from \$42 million).
- **FID**
  - Paul noted that this is the first time in eight years that we are back to pre-98 interest rate volatility lows. While Lehman ended November short \$2.8 million/bp across the dollar, Yen, and Euro, this had switched by the end of December to be long rates. Basically, they made a profit on the short position through December, and on December 19 decided to take the P&L and flatten out their exposure. As of the meeting, Lehman was long \$630k/bp in the USD, long 450k in the Euro, long 400k in the Yen, and long 250K in Sterling.
  - We also discussed the buildout of mortgage platforms in Europe and Asia.
  - All market risk from the Tenasca deal has been hedged, but apparently there is some deal-contingent risk as the deal has not yet been blessed by regulators and if fails to close, Lehman is left with a large, unhedged position. (I wonder how these things are booked? Obviously, these positions are on the books, and feed into LehmanRisk. If the deal fails to close, all of sudden they disappear, and they are just left with the hedges which are now directional exposures? Morgan may have had a similar situation with TXU)
  - Within FX, most of the exposure is being driven by EMG exposures. The carry trade is back on with Japan, as are FX vol plays and curve

steepeners. Paul noted that there appears to be little risk aversion in the current market. Also, the desk is long USD versus short HKD (this trade is captured by the event risk component of RA as it involves a peg break). The desk is long very cheap out-of-the-money puts on the HKD. They have a larger short in the Yen. We also discussed Mo Grahme (?sp), who is now responsible for all EMG exposure ex-Asia across the firm. He won't have his own P&L, as it will still lie within the specific business area – his role was actually quite unclear, so I think that we might want to meet with him in six months or so when he's transitioned into this yet-to-be-defined role and understand exactly what he and Lehman are doing in the EMG space, and how those exposures are being aggregated and managed.

- GPS has gone long HY credit, and is hedging this with long puts and short calls in equity positions. I think that we might need to focus on prop trading, as they are continuing to grow prop trading out in various places, and it is not always clear who is/is not prop trading – sort of a CSE follow-up. We did this in equities, but have not to the point focused extensively on prop FID trading.

- **Equities**

- The increase in equities VaR was driven by a 50% increase (\$1 billion) in net long delta, to \$3.1 billion, as well as a decrease in long gamma. This was across all regions. In Europe the net delta was \$1.1 billion, up \$560 from the prior month. The increase was driven by execution services (cash), as well as equity strategies. Equity strategies have a large number of prop traders who take long/short positions. This is the area that houses the momentum strategies than can be volatile (they area that lost money last year after the shooting of a Turkish minister). In Asia, the markets were up 5.8%, driven by a weakening JPY as expectations of a rate hike fell, therefore increasing the prospects for exporters and earnings.
- US volatility increased their outright delta, and went from being slightly long gamma to short \$26 million. Overall, long gamma fell from \$330 million to \$217 million. Theta also switched from being overall negative (paying for gamma) to a slight positive, driven entirely by the US volatility flow book.
- There were 10 block trades in the month, with one \$1 billion position of 8.1 million shares. This was down to 4.8 million shares in day one, and only a small position remains.
- Global Trading Strategies is long Indian equities, and had a good December with respect to Imperial Sugar (a frequent contributor to VaR excessions).

- **Backtesting results**

- Munis had an excession due to the muni-treasury basis.

- **Scenario Analysis**

- The worst case stress loss again comes from the Equity Crash, but the actual loss is down slightly (at \$2.0 billion, down from \$2.2 billion last year.). This is again coming primarily from the HY and equity business, although GTS is now posting a bigger loss (\$468 million) than the flow equities business – reflecting their higher long delta (\$1.6 billion).
- The second-worst loss was \$1.66 billion, from HY and LBO default scenario – basically unchanged from last month . FID drives the losses here, with HG performing the worst within FID.
- Third-worst is Liquidity Crunch, \$1.72 billion – main drivers were very similr to HY/LBO scenario.

**CREDIT RISK (STEVE SIMONTE, PATRICK MCGARRY)**



## Update on MLN (Jeff Goodman)

Jeff again stated that exposure to MLN is through repurchased claims. In total, Lehman bought \$1 billion of product from MLN last year, and there were a fair number of EPDs. The total claims are \$51 million, again which Lehman has put an expected loss of \$15 million (i.e. assuming they have to sell this \$51 as scratch-and-dent, they would get about \$40 million for the collateral, leaving them with a loss of \$15 million). They were supposed to buy \$750 million of loans off MLN's warehouse lines in late December, but cancelled the sale when they failed to make good on the putback claims (most of this was to be bought off Merrill's warehouse line) – they had a right to cancel this trade because MLN had breached a prior contract. Apparently, MLN has a \$17 billion servicing portfolio, and has sold \$3-4 billion of this (don't think it was to Lehman). Jeff said that nothing was going right now, with respect to Lehman purchasing the company as had been mentioned by other firms. According to Gerry and Ed, though, we learned the next day that Lehman had conducted due diligence but decided not to move ahead with a purchase of all or part of MLN. A follow-up call with Jeff confirmed that Lehman had been looking at purchasing the wholesale broker network, and possibly some servicing rights, but not the company per se, feeling that there was little equity left (although the owners wanted to preserve what was still there). Jeff more or less said that he wasn't sure what had been publicly known – I think this hesitation was the source of the confusion.

## Commitments (Patrick McGarry)

- The pipeline of deals by bucket is as follows:

Bucket	12/27/06	11/29/06	10/31/06	9/29/06	8/31/06	7/28/06	6/29/06	5/31/06	4/28/06	3/31/06	2/28/06
Conditional deals	10,179	17,165	10,073	9,254	9,601	7,894	10,330	8,915	7,539	8,512	10,541
Contingent	2,899	5,602	3,204	2,958	6,102	2,045	1,600	1,473	1,231	603	1,878
Mandated, committed letter	7,540	8,221	10,444	15,031	14,052	15,234	11,879	13,628	12,672	10,268	4,407
Mandated, final docs	16,489	13,538	14,496	12,114	12,325	10,933	12,482	8,393	9,149	7,127	6,118

- Patrick told us that they will no longer be providing the in-depth deal-by-deal report, as they plan on moving to a more top-level summary that will focus on the key risks and be more streamlined. It's unclear as to whether they will still be producing this report for internal (as opposed to senior-level reporting) use – I think that they are going to show us the new report next month, and if we don't feel it has enough detail then we can inquire further about the status of the current packet.
- Market update: the market remained robust throughout December, with strong technicals and good liquidity. Patrick mentioned that covenant-lite was becoming the norm. There is increasing pressure on leverage metrics (although he said that levels weren't too high yet), but that pricing pressure continued, for example with respect to flex terms. Apparently senior pieces tend to have 50-75 bps of flex, while in Europe market standard has been 25 bps. The US market is not yet at European levels, but there has been a definite shift towards that practice of limited flex.

- Lehman is advising Vornado in its bid for EOP, and I believe they are providing some sort of financing commitment (they were quite vague about this).
- Highlights of non-real estate related transactions include:
  - Region of Campania (\$1.446bn) was scheduled to fund during the week of the December meeting, but had not closed yet at the time of the January meeting – there will still some uncertainty around the disgruntled employees issues (Patrick wasn't very sure about this story – I think he wasn't there last month when Jeff mentioned it).
  - ProSiebenSat.1 Media AG – this is a German company. KKR and Permira want to buy this company and then acquire and merge it into SBS Broadcasting. Total financing for this deal is \$9 billion, of which Lehman's expected amount is \$1,581 – this is a fund-certain deal with no MACs. (this is in the Committed category).
- Highlights of real estate finance includes:
  - CarrAmerican closed, with a commitment of \$2,250. Patrick said that Lehman had sold \$500 million of bridge equity in the deal at this point, and would get back to us with more details.
- Questions for next meeting (not discussed at January meeting, move to February):
  - Lehman has suggested a “Whole Business Securitization” for the acquisition financing for the LBO of Aramark. Get details of this type of financing.
  - Several transactions say that Lehman's commitment is to be a certain funds no-MAC basis. Clarify that this does not mean covenant-lite.

#### Counterparty Credit Exposure (Steve Simonte)

- Current exposure increased from decreased slightly from \$25.740bn to \$24.607bn. Stock loan was up \$1.6 billion, while repo was down \$2.2 billion. As mentioned above, Steve “complained” that exposure to IG names went from 97% to 98%, the wrong direction as far as they are concerned given the mandate to take more risk.
- Hedge fund update: We did learn that Moore is their second biggest client globally (I assume hedge fund client). Also, we confirmed that Lehman allows 4-5 funds to trade OTC energy derivatives with no upfront margin. We also briefly discussed whether Lehman was transacting with its own hedge funds and this question wasn't really understood – we should probably go back with the snapshot that shows Lehman's exposure to its own funds and use that as an example.
- Tenasca update (Peter Galbraith)
  - In June 2006, Constellation energy sold six of its natural gas plants to focus on its core business. They set up an auction, and Tenasca won with a \$1.6 billion all-cash bid. Tenasca is a privately held, 10-year-old company that develops power plants – they currently have 700 MWh of capacity with 18 plants. They also trade and provide risk management services. Tenasca has its own private equity fund with \$840 million in committed capital. Of these

six plants that they purchased from Constellation, 3 are more sophisticated (generate more power on less input) and three are more basic. In total, they have over 3100 MWh of capacity. The Tenasca private equity fund put in \$450 million in equity, and Tenasca got a loan from both Credit Suisse and Lehman (Credit Suisse was the big lender – I believe Lehman may have gotten in at the last minute, but originally I thought Lehman had no lending role), with the intention of structuring at 1<sup>st</sup> lien term loan, a 2<sup>nd</sup> lien term loan, and a revolver. The financing required guaranteeing cash flows. The CA plant in this deal came with a big hedge –which provided some but not all of the hedging necessary. Lehman won the hedging mandate for Rio Nogales, one of the “sophisticated” plants located in Texas, while someone else won the rest of the CA hedging. This was basically a heat rate call option, which was sold to Lehman. Lehman now has the right to buy power at fixed cost (e.g. multiple of gas), and pays a monthly premium to Tenasca providing them with a fixed, stable cash flow. When the price of power rises, Lehman has exposure to Tenasca, and feels comfortable with this right-way risk (ostensibly the plan is worth more than as well). The transaction was executed with the holding company for all six plants, and Lehman is in the first lien along with Credit Suisse. Given the \$450 million of equity and \$495 million of debt in the holding company, Lehman estimates the cushion to be over \$900 million, which is 50-55% on an LTV basis for all first lien claims. Lehman also charged an upfront “credit” fee to institute hedging - they currently have \$16 million in outright CDS protection on Tenasca debt and plan on buying another \$54 million in contingent CDS – this has NOT yet been purchased.

#### **ENERGY PRICE VERIFICATION (NEERAJ CHOPRA, SCOTT GOSWAMI, ALICE ZHANG)**

- Global FID pricing variance was \$125 million conservative, of which \$108 million was from real estate (discussed during our last price verification “deep-dive”). In equities, pricing variances were \$12 million conservative.
- Energy valuation control: Scott Goswami has overall responsibility for energy (and rates), and has 2 part-time valuation people assigned to the energy space. Lehman hopes to hire a full time energy valuation person shortly, someone that have identified who is currently in Houston. This person would have one associate (already hired) focusing on energy valuation. This may be an area to revisit when the desk has ramped up more significantly, and the new valuation controller has been hired and gets established at Lehman.
- Price verification: Power uses Totem and 10x to test 35 curves, and has only 4 untested locations. Natural Gas also uses Totem/10x and has 26 curves, with no untested curve locations. The entire volatility surface is also tested. The controllers noted that the traders were not that active in many areas, and therefore put a good

deal of value on external marks. For Oil, Brent and WTI are being submitted to Totem/10x, and some broker quotes are obtained from ICE.

- Interestingly, Lehman appears to be driving some of the efforts to get Totem and 10X to cover more products (heat rate option, more illiquid locations in power), which seems slightly unusual given that they are a small player in the commodities space, and it seems like others would have already pushed for this. However, I think that the bigger, more active players have much better market visibility, and therefore less immediate need for the marking services to be involved. Areas of improvements are improving volatility testing and doing full re-pricing by recalibrating skew fitting polynomial coefficients, improving automation, and correlation testing (agreeing on a correlation, and not allowing change until visible proof of new price).
- In November, there was a rather large “untested” trade in the power bucket, driven by one location where the desk was short.

#### **FOLLOW UP**

- Firmwide VaR climbed to \$63 million, reflecting Lehman’s significant increase in risk appetite. In addition, for 2007, they have increased their firmwide risk limits by 45%, compared to a 10% increase in 2006. Lehman has also continued to build up their proprietary trading businesses. We will continue to discuss this evolving approach to risk-taking, as well as risk management processes around new proprietary trading activities.

## Market Risk at Lehman

-Change in VaR methodology for GTS (use of abbreviated historical time series, and putting a “floor” on equity prices). GTS is also subject to an event risk charge through the deal-break component. Apparently this change was made last year – we just learned about it at during our May meeting. Paul said that Sandeep had written a paper about this, and that he would send it to us. I emailed Paul to follow up on this request on Tuesday morning (6/4), but did not hear back.

-Firmwide VaR excession in late February 2007, with an approximately \$100 million loss (predominantly driven by equities, which also had an excession at the divisional level (\$80 million loss)). We were not notified of this.

-Inconsistencies around GTS delta (for example, based on verbal and written reports, the equity delta for end of March 2007 was anywhere from \$3.4 to \$4.4 billion).

-John Hoffman, who is the main liquid markets prop trader, trades from Miami for a portion of the year. We have discussed Hoffman numerous times, and this has never come up (not a crisis, but probably something that they should have mentioned given that he is, by my understanding, their single most profitable trader).

-We were told in February (at Madelyn’s last appearance) that Jeff may become the new market risk manager and that Paul would transition to a more admin/quantitative role. No updates subsequent to this.

-As P.C. mentioned, we postponed the model validation process after Peter left until a new head was in place. When this did not seem immediately forthcoming (Madelyn did mention in February that she was considering an internal candidate, which we interpreted as referring to Peter but in hindsight may have meant Marcelo Cruz), we decided to keep the process moving, which led to a somewhat awkward meeting this month where Peter was responsible for telling us about Marcelo’s new role, and how Marcelo would report to Fong (who was alluded to but not named). He was somewhat unable, not surprisingly, to speak with great certainty about how model validation would be structured going forward, but did an admirable job of trying to move the process with us forward.

## Credit Risk at Lehman

-Also at Madelyn’s last appearance in February, we were told that a new head of credit risk was being interviewed. In bilateral conversations with Matt, Madelyn indicated that person was Vince DiMassio but we have had no further updates on this. We also heard that Patrick McGarry was possibly moving to Tokyo to be in charge of commitments there, and have heard nothing further about this move. We are unclear where Steve Simonte will fit in with having a new global head of credit risk.

-We have asked multiple times about the distinction between the last two pipeline buckets “Mandated committed letter” and “Mandated final docs” and are still very unclear about the differences.

- On the commitments side, the main problem is the information flow. We are briefed by Patrick off the firmwide risk snapshot, which lists all the deals in the pipeline. Patrick gives us a sentence or two on the commitments that are big, or that have fallen apart since the report was issued. We keep asking for more detail, and received an additional package for a couple of months that listed the details of each transaction. We no longer receive that, I believe he said they weren't producing it any longer. As an example, we have received very little information on the TXU deal, for which Lehman is providing \$4bn in financing. Each month we have asked for an update and basically are told “it's fine.”

-On the counterparty credit side, we have requested new metrics (ie top ten IG and NIG MPE and CE) and have received them, along with a description of the underlying exposures. No problems there.

## **MONTHLY RESULTS (ED GRIEB, TONY STUCCHIO)**

- November was a strong month, with net revenues of \$1.716 billion (up 17% compared to average month 2006).
  - Fixed income was down versus average month '06. Credit products did well as last month. Mortgages were down again as both origination and securitization volumes fell with tighter margins. Securitization volume was \$7bn compared to an average \$11bn in '06. February volume is projected to be \$8bn. Lehman has factored in losses in resi mortgages throughout the year by increasing reserves for potential losses. Real estate (CMBS and PTG) was also off.
  - Equities revenues were up significantly again versus avg month 2006 (\$481m for Jan. versus \$297 average). Cash volume was up with more active equity markets. Principal Trading Strategies also had strong results, and has already made half their budget for the year.
  - Investment Banking was up 12% compared to avg month 2006. TravelCenters and the Kraft/Altria spinoff were contributors. In addition, several block trades were profitable during the month (IB gets some credit for block trades brought in through IB relationships).
  - IM had a strong month, with AUM up to \$235bn. They took mark to market gains on the various hedge fund deals (Opsrie, GLG, Marble Bar) as incentive fees were disbursed.
  - LBI's excess capital was down to \$3.7 billion \$300 million of sub debt matured, bringing excess capital down to the \$3.7 billion range. Lehman has no plans to replace this sub-debt since the excess capital level is strong. Net income was \$165m. Lehman recently met with Grace Vogel at the NYSE to discuss the issue of split hedges. NYSE agreed to examine the issue.
- The CBOT has begun onsite work for their annual audit.
- Two acquisitions recently closed: Capital Crossing and Wilton Re (insurance).
- The DE Shaw deal is still in negotiation, perhaps awaiting the results of the Fortress IPO (DE Shaw may have wanted to see how that fared).
- Laura told us that the NPC had just approved the opening of an office in Brazil, which is currently just a sales office. All existing products are currently trading out of New York. However, Lehman is applying for the licenses to do local, on-shore trading, and hopes to have this up and running in 2008.

## **RISK APPETITE**

- RA usage was down to \$2.4 billion, down from \$2.6 billion. Real estate was down to \$472. Lehman clarified that new limits will not be backdated to 12/1, so the VaR limit breaches seen in December will continue to be true limit exceptions.

#### MARKET RISK (JEFF GOODMAN)

- Firmwide VaR is down \$12.3 million month on month, from \$62.7 million at the end of December to \$50.4 million at the end of January. Firmwide VaR fell more than either of its components, as a result of decreasing correlation between equities and the rest of the firm. The change was driven primarily by equities (\$27.3 to \$18.7 million), which had less delta and was less short gamma and vega. Within FID, most desks were down but the aggregate VaR was up (\$35.2 to \$39.5 million) due to a decrease in diversification benefits.
- The equities VaR tends to move significantly on a daily basis, often driven by the volatility flow business (which happened to be down \$5 million on a month-to-month comparison). That said, the business is now more short out-of-the-money (gap) options, while less short in more local positions. Hence, the VaR has decreased while the stress tests, picking up the wings, show an increase in risk.
  - There was a spike in equity VaR towards the end of the month as the business got short vega, but overall VaR came back down at the end as delta was reduced.
- There was a slight up-tick in FID VaR at the end of the month due to EM exposure within the FX business, a measure then tends to move around on a daily basis as the desk enters and exits positions quickly (less structural trading). In general, they tend to be long local currencies (Mexico, Turkey, Brazil) and short the majors.
- Update on subprime mortgages
  - Macro: 20 shops have gone out of business in the last 6 months – essentially one a week.
  - Five of Lehman’s customers have been affected, with the biggest being MLN. ResMae is the most recent – they had a warehouse line with Lehman. Lehman has taken custody of the collateral, and is currently going to auction with it. As of now, Aurora is now servicing all of these loans. It was a \$500 million Scratch-and-Dent committed line, with \$240 funded, and a \$3 million haircut. A small portion of the \$240 million wasn’t eligible for this warehouse line, so I’m guessing this would be ‘put back,’ although I’m not sure where. As mentioned above, Lehman has physical possession of the ResMae files.
    - Laura mentioned that CAD was going to be doing a post-mortem on ResMae as part of a new committee within CAD that will distill “lessons learned” from suboptimal situations.
  - Lehman has been remarking all of its warehouse facilities, often resulting in calls around \$10-\$20 million. All of these calls have been met so far, but customers with less capital to post to meet these types of call may have



difficulties down the road. Jeff also mentioned that covenant breaches are beginning (e.g. you must earn \$1/quarter, or be profitable), in which case Lehman may convert a line from committed to uncommitted.

- Lehman did not have a line with New Century – he said that you had to “pay to play” with them (I assume a reference to their size and aggressive demands?), and Lehman did not want to do this.
  - Jeff mentioned that Lehman is terminating some of its smaller lines.
  - Jeff also spoke about the continuing widening in the ABX, particularly in the 06-2 and 07-1 vintages where people came in at the end of the cycle, and housing valuations may not have correctly reflected a softer market. Jeff also mentioned that many hedge funds are using the ABX as a vehicle to short, since they can’t really do this with cash positions. He also noted that the whole deal is not blowing up, since spreads at the higher end of the capital structure remain tight. Spreads for the 06-1 vintage are much tighter than the other two.
  - Jeff stated that the desk is not trying to run outright positions in the ABX – they had been hedging with some ABX shorts, as well as some deal-specific CDS. They were short \$900 million notional in subprime spread protection, and short MTAs in the \$600-700 range.
  - With respect to the cash securities, Jeff said that buyers are no longer making generic pool bids now – they prefer to pick and choose the parts they want. The BBB- cash bonds are trading in the upper 200s – possibly in part because the CDOs still have to buy securities (demand) and you can’t short them (less selling pressure) – in other words, there is still a bid for subprime deals.
  - Jeff also provided us an update on MLN – they currently have \$51 million of EPD claims submitted to bankruptcy court, and are estimating a loss of \$15 million on these. Jeff subsequently called to let us know that the EPD claims to MLN now stand at \$80 million, with an estimated loss of \$20 million.
- Contingent hedging
    - Last month we had discussed the Tenasca trade from a credit perspective, and we noted in the write-up that hedging on deal-contingent positions could lead to losses if the deal were to break. Steve Simonte and Jeff Goodman confirmed that this was indeed the case, as in the Tenasca case the deal-contingency was essentially a free option written by Lehman. Lehman tries to estimate the break-down probability and hedge accordingly – the hedging is a JV between banking and the desk, in order to ‘keep the bankers honest.’ Steve noted that this deal would probably only break due to regulatory issues, which generally do not pop up out of the blue – you would usually hear of trouble early on, and ostensibly be able to begin unwinding. Incidentally, with contingent FX trades, the desk may probability-weight hedges as well.
  - Backtesting

- There were no exceptions this month.
- Global IR products had some sustained loss days mid-month from vega positions, with vol continuing to be low (bleeding P&L on the European long vega position that has been on for some time). The US tends to move their position around more, tending to take skew views (short versus long) and less outright positions. Asia has less of an outright position right now after suffering their vol-related losses in the summer.
- Mortgage trading had three chunks of losses through January, all resulting from write-downs (on whole loans or residuals? – we can follow up at March P&L meeting)
- Energy suffered a number of loss days (in the \$2 million range) due to oil and heat rate options
- Scenarios
  - The worst case loss was again from Equity Crash, at \$2.25 billion (up \$250 million from last month). The other big losses are EMG (\$1.7 billion), parallel move down (\$1.5 billion), Black Monday (\$1.7 billion), and liquidity crunch (\$1.5 billion).

**CREDIT RISK (STEVE SIMONTE, PATRICK MCGARRY)**

Commitments (Patrick McGarry)

- The pipeline of deals by bucket is as follows:

Bucket	1/31/07	12/27/06	11/29/06	10/31/06	9/29/06	8/31/06	7/28/06	6/29/06	5/31/06	4/28/06	3/31/06
Conditional deals	7,883	10,179	17,165	10,073	9,254	9,601	7,894	10,330	8,915	7,539	8,512
Contingent	4,318	2,899	5,602	3,204	2,958	6,102	2,045	1,600	1,473	1,231	603
Mandated, committed letter	15,736	7,540	8,221	10,444	15,031	14,052	15,234	11,879	13,628	12,672	10,268
Mandated, final docs	15,989	16,489	13,538	14,496	12,114	12,325	10,933	12,482	8,393	9,149	7,127

- Deal flow was at an all-time high, with \$150b projected to hit the market in the coming weeks. Liquidity was still high, resulting in spreads coming in and the number of covenants diminishing. Generally, only 3 financial covenants remain now: leverage, net interest margin, and capital expenditures, down from 5-6 covenants in the past. The remaining covenants are all “occurrence-based” with an aim towards precluding a firm from incurring new debt above a cap, say in the course of an acquisition. Big sponsors are driving the trend, with Lehman “enabling” them. The market is not requiring covenants right now, and CLOs/CDOs have a huge appetite for loans. In addition, the number of deals flexing down in pricing is increasing.
- Patrick did note an additional cause for concern. Because investors are each receiving small allocations now, the conventional wisdom is that a default will not have a big impact. The focus is on liquidity rather than what is being underwritten. Patrick feels that this prevailing view is misguided.

- The Equity Office Properties commitment of \$7.6bn has gone away as Lehman was backing Vornado, who lost out to Blackstone.
- A huge number of CMBS deals are in process, with “no hiccups” in the market. Class A office space in tight markets is very strong, with pension fund investors looking for a place to keep their money for 10 years. The hotel sector also remains very strong.
- Highlights of deals this month include:
  - Domino’s Pizza (\$810m) is a recapitalization deal which will be taken out by an ABS securitization . This is similar to the Dunkin’ Donuts deal, in that the receivables being securitized are franchise fees. In association with this deal, Domino’s has entered into interest rate hedges with Lehman to lock in the financing cost, generating \$11.4m in CE and \$58.7m in MPE.

#### Counterparty Credit Exposure (Steve Simonte)

- Current exposure increased from decreased slightly from \$24.607bn to \$24.494bn. Investment grade exposure remained very high at 97%.
- Lehman recently made a \$167m relationship loan to Delta Airlines. Steve indicated they debated about whether to do this, and ultimately thought that the opportunities for future business made it worth it. That said, they are hedging the exposure right away, and the loan will have a negative mark with the hedge. Specific future business include M&A opportunities and fuel hedging. Lehman has a 50% probability on providing \$417m of bankruptcy exit financing. Financing is expected to close and fund in April, concurrent with Delta’s emergence from bankruptcy.
- New names on the top 20 counterparties by CE include Barclays (\$191m, FID derivatives), Aegon (\$168m, stock loan), SanPaolo International Fund (\$119m, sec lending). Also included is MedImmune, who did an own share call spread, with Lehman’s exposure comes from buying out of the money calls, and would thus lose if MedImmune defaults when their share price is high, an unlikely situation. Lehman has three deals totalling \$1bn (MPE?) of this sort. Steve argued that the capital charge associated with this deal is uneconomic and may be something to reconsider.
- New non-IG clients on the top 10 list include: Domino’s (see above), E\*Trade (\$4.6m CE, \$55.9m PE, TBA trading), and Lehman Brothers Real Estate Partners (\$30.2m CE, \$46.5m PE, FX hedging).
- New names on the top hedge funds by MPE include:
  - 2 Goldman Funds – GS Global Opportunities Fund Offshore (no CE, \$44m MPE) and GS Global Opportunities Fund (no CE, \$28m MPE) – MPE results from treasury positions done flat
  - III Finance LTD (no CE, \$40m PE) – from IR swaps and CDS
  - Sister funds – Rovida Holding Limited (no CE, \$30m PE) and RR Investment Company Limited (no CE, \$30m PE) – PE from futures and currencies

- Bridgewater (\$16m CE, \$29m PE) – short-dated FX business. Bridgewater does not have a margin facility in place for any currencies (no initial margin and no variation margin). Steve related that this is market convention for Bridgewater to receive no variation margin, which has since been confirmed with other CSE firms.
- New names in the top energy exposures include:
  - Encana Corp (\$2m CE, \$52m PE) – production hedging
  - Constellation Energy (\$3m CE, \$31m PE) – market maker

**FOLLOW UP**

- Lehman has been aggressively remarketing the collateral held through its mortgage warehouse lines. As the collateral has been devalued, Lehman has made margin calls on their clients, the mortgage originators. These calls have been in the \$10 - \$20 million range, and so far clients have had no difficulties in meeting them. However, the risk manager noted that widespread calls of this nature by many warehouse lenders may cause problems for liquidity-constrained originators. Lehman, already a large player in the mortgage space, is keeping a close watch on this phenomenon.

### MONTHLY RESULTS (ED GRIEB, TONY STUCCHIO)

- February was another strong month, with net revenues of \$1.647 billion (still up compared compared to average month 2006).
  - Fixed income was up versus average month '06, on the back of strong customer activity. Real estate revenue was at \$281 (compared with average month 2006 (avg 2006) \$142). Securitized products were down 60% versus avg 2006.
  - Equities revenues were up significantly again versus avg 2006 (\$411m for Jan. versus \$297 average). The business was strong across the board, globally.
  - Investment banking was basically flat when compared to avg 2006. Advisory fees were down 13%, and equity origination was down 11% despite more favorable equity markets. Debt origination was up 17% due to leveraged finance deals in spite of the market being down 20%.
  - Within IM, AUM climbed by \$1 billion to \$236bn. A few days prior to the meeting, IM closed on its investment in DE Shaw, which had been discussed in prior memos.
  - LBI saw a fairly sizable decrease in net revenues, at \$260 million compared with avg 2006 of \$542 million. This was due to a write-down of NIMs and residuals. LBSF had the hedges and recorded the gains, but due to the split hedges issue LBI registered a loss.
  - Laura and Tony noted that firmed had applied to open LB Canada in Toronto – this would be primarily an investment banking branch, initially capitalized with around \$15-20 million. Treasury was meeting this week to determine how to fund it. This has not gone to the NPC committee yet, I think because they were waiting for Canadian approvals first.

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### RISK APPETITE

- RA usage was basically flat at \$2.45 billion, compared with \$2.4 billion last month. We are no longer getting the firmwide risk snapshot, as Madelyn no longer briefs the Risk Committee from that. Therefore, we no longer see RA usage of real estate. We'll probably need to request some sort of additional snapshot that that we can still track areas that don't show up in other reports, like real estate and private equity (which we've recently learned drives almost all of the RA usage within IM).

### MARKET RISK (PAUL SHOTTON)

- VaR

- Firmwide VaR peaked at \$72 million in February, driven primarily by an equities net long delta of \$3.6 billion. VaR fell sharply at the end of the month as traders cut back on their positions in light of the falling equity markets, and was down to \$59.4 million by the end of the month. On the 27<sup>th</sup>, there was a one-day loss of \$80 million, which essentially caused a VaR excursion at both division and firmwide levels.
- On a month-to-month comparison, the biggest driver of change was FID, whose VaR rose by \$10 million to end the month at \$50 million. VaR increased within Securitized Products, from \$12 to \$20 million. This was primarily driven by an increase in market volatility which was picked up quickly due to Lehman's use of exponential weighting in their VaR methodology. In addition, spread exposure increased by \$1.2 million/bp to \$7.9 million. Paul noted that Lehman has some positions (e.g. Alt-As) conservatively proxied to the time series for home equities, where the time series is more volatile than the actual position. They are reviewing those mapping decisions in light of recent ABX volatility. VaR was also up for credit products on increased spread exposure, ending the month \$3.4 million/bp longer, at \$12 million/bp (can't see this in packet). FX VaR fell on the reduction of the net long foreign versus USD position, ending the month mostly flat (short \$13 million versus ending last month long \$110 million). They went long EMG into February 27 (Russia, Turkey, etc), and lost money on these positions. However, they were able to reverse their longs quickly – for example, in Turkey they began the month long \$134 million but ended short \$54 million (packet showed short \$60 million). Rate exposure was not a big driver of risk this month – there was a curve exposure trade in USD, and a smaller trade of this nature in the Euro and GBP. For this trade, they were long the short end (2-5 year) and short the long end (10-30). The long volatility position was increased by \$15 million overall (\$12 million in packet), with Europe holding most of the outright long vol positions.
- In equities, outright net long delta moved through out the month, beginning at \$2.5 billion, peaking at \$3.6 billion, and ending at \$1.4 billion. They ended the month net long gamma and net long vega. Behind that, they had increased net gamma by 85% to \$585 million at the end of the month, and reduced the outright long vega positions, ending at \$7million/vol point. The combination of a reduction in vega, a reduction in delta, and an increase in gamma all led to a reduction in overall VaR, as the Equities division VaR fell from \$18.7 million to \$15 million. Block trade activity was strong throughout the month, with investors looking to monetize positions. Lehman won 14 deals, with the largest being \$422 million of Owen Semiconductor, and only three deals over \$100 million. In total, the desk made \$18 million in profit throughout the month. The desk did still have \$153 million of Aspen Insurance (out of a \$250 million block) at the time of the meeting (or the end of the month?).

- GTS did not have many changes during the month. They had a profitable quarter with positions on merger arbitrage. Paul noted that when the market sells off, the risk of deal break increases. GTS has now closed out their GM positions, although they still have a big position in GMAC. They do some relative value trades (merger arb) where they are long the target but the acquirer is a sponsor, so the position is not hedged. In March
- Overall, markets were benign until the end of the month, with credit spreads tightening and treasuries down slightly. However, when China sold off 9%, Greenspan spoke about a possible recession, and durable goods were weak, the markets got spooked and, among other things, began the unwind of the Yen carry trade, causing a rally in the Yen versus USD. In the last days of the month, there was a flight to quality, and credit spreads widened. The CDX IG widened by 24%, closing at 33. Paul noted that the most liquid options moved faster – i.e. the index widened first, followed by single name CDS and then by cash.
- Backtesting
  - There was one firmwide exception on February 27, with a loss around \$95 million. As mentioned previously, this was driven by equities.
  - FID
    - Liquid market prop had an exception on the 27 when Treasuries rallied in a flight to quality, hurting their short rate exposure. They also were long equity delta (we haven't really focused on this – how much equity trading is LMP doing? Tend to think of this as John Hoffman's trades, which are in the rates space).
    - High grade had an exception on the 27, when they went in long credit and the CDX widened by 24%. The GM (ResCap) position caused some pain, and it was subsequently trimmed.
    - Munis had an excession on the 27 – the usual muni/treasury basis story with munis lagging treasuries, and the loss was followed by a large profit the next day.
    - FX almost had an excession from the EMG positions, but the last two days of the month were profitable as the desk quickly cut their positions.
    - Equities global lost \$80 million on 2/27, which was offset to some extent by intraday P&L (Paul didn't know how much intraday P&L there was)
    - Cash products, volatility flow, equity strategies, and systematic trading had 2/27 excessions – no additional color provided.
    - Equities volatility had a loss on the 27 from Hong Kong, which had a net long Asia position. However, the next day there was a huge profit (about \$27 million ) from the spike in volatility, as the

long vega position was marked up. Ben Fuchs is still overall bullish on Asia.

- Equities portfolio had purchased a large blind risk basket on 2/26, purchased at a discount of \$3.5 million. This position caused a VaR excession on 2/27, contributing to a groupwide loss of around \$8 million.
  - Event driven had an excession on the 27. Paul mentioned that while most of the trading is around announced deals, some is on possible takeover targets, also known as “rumortrage.” We had actually discussed this at Lehman a while ago after we learned the term “rumortrage” at BS, and Paul said the desk only trades on announced deals, and that you can’t make money trading on speculation unless you have inside information. The desk (and Paul) seemed to have changed their opinion on that one.
  - Equity syndicate had an excession on 2/27 from the Aspen Insurance block position, mentioned above.
  - Mortgage trading had three chunks of losses through January, all resulting from write-downs (on whole loans or residuals? – we can follow up at March P&L meeting)
  - Energy suffered a number of loss days (in the \$2 million range) due to oil and heat rate options
- Scenarios
    - The worst case loss was again from Equity Crash, which was down to \$1.9 billion (down from \$2.25 billion last month). EMG also had a big reduction (\$1.7 down to \$1.4 billion), as did parallel move down (\$1.5 to \$1.2 billion), Black Monday (\$1.7 to \$1.2 billion). Losses were down in the scenarios due to reduced equity delta and no large rate exposures – i.e. the short bias which has been on for some time was flattened. The most painful scenarios are those with a flight to quality and bull stepping in rates (which will hit short rate positions). Liquidity crunch was essentially unchanged at \$1.5 billion (ask about this next month – why did the delta reduction not affect this one?).

#### UPDATE ON SUBPRIME MORTGAGES (JEFF GOODMAN)

- Jeff again reiterated that it costs about 1 ½ points to originate a loan, and subprime loans are now selling under par – effectively causing the originators to lose money on loans they’re making. Combined with losses from EPDs (upfront) and reps and warranties (later in the life of the mortgages), it’s become extremely challenging for the originators to survive. Jeff did note that with the consolidation in the industry, even in the face of the meltdown, the pricing power was beginning to return to the originators. The strategy of cutting rates to drive other originators out of business is no longer feasible, and the originators left are raising rates so that they can clear loan sales at profitable levels. However, Jeff noted that it is still difficult for all parties to see the cash exit price given the current market dislocation.



- Lehman recently included their MLN collateral in a deal last week and were able to sell off the most, if not all, of the capital structure (including BBB pieces). Interestingly, Jeff noted that since MLN is bankrupt, the collateral was sold with Lehman guarantees, which actually makes it easier to sell (i.e. it's hard to sell the collateral of a rapidly failing company, who still makes the guarantees but may not be around to honor them, than the collateral of an already defaulted originator, in which case the seller guarantees the loans).

- The cash spreads on subprime are starting to slowly catch up with the synthetic space. Cash spreads are specific to deals, and there is quite a bit of volatility as well as volume. Spreads on BBB were at 800, and spreads at BBB- were at 1000 (although it's worth noting that the ABX BBB- had broken the 2000 mark). Market participants are taking both sides of the ABX – Jeff noted that at these levels, people are willing to buy and sell. He also mentioned that there were many ABX relative value trades going on (ABX versus CDO, versus single-name CDX).

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- Lehman currently has \$216 in reps and warranties claims, mostly from EPDs. They are estimating a \$46 million loss on this (this includes \$20 million from MLN, which has not changed from last month). The whole loan desk has a reserve of \$79 million against this estimate.
- BNC and Aurora have taken reserves of \$120 for putbacks – these reserves are currently being reviewed and may be increased by \$20 million. We'll discuss this with Gerry Riley during our next P&L review.
- ResMae losses, stemming from the warehouse line, are estimated to be \$15-20 million, assuming no recovery from the counterparty.
- The repo desk is financing \$3.7 billion of sub-prime securities (\$754 million BBB or below), which are being repriced constantly. So far, all margin calls have been met.
- Lehman has less than \$2 billion funded on all warehouse lines, under about \$5 billion of commitments (ex-BNC). Most of this is with subprime (\$700 million is to Alt-A). Lehman continues to mark the lines daily at marks that they can live with if forced to take the collateral. One of the larger lines was a \$1.5 billion commitment to Option One, owned by HR Block. The line is now down to \$1.1 billion, of which \$450 million is funded. This line has a change in control provision in the contract, so when Option One is sold (it is currently on the block), they either have to pay, or, more likely, renegotiate the facility terms. Lehman also has a \$500 million line with Accredited, on which \$390 is drawn (\$270 million of which was net funded by Lehman, there seemed to be another participator in the line). The day before the meeting, Accredited met a \$5 million margin call.
  - Lehman was also the original structurer of Carmel Mountain, an extendible ABCP facility for Accredited. This is a \$2.5 billion facility,

although it only has \$360 million in collateral in it and \$250 million of CP outstanding (i.e. very overcollateralized). There is also a market value swap on the facility, which is intended to protect against market risk, or a declined in the value of the collateral – essentially a put. The notional on this swap is \$2.5 billion, and it was syndicated to 5 dealers, including Lehman, leaving Lehman with a notional of \$500 million. The CE is \$72 million on this swap (1/5 of \$360), but this is a slightly different version of CE – it is akin to the funded amount on a warehouse line. It covers only a drop in market value, and not any credit risk (i.e. if loans are delinquent, that is the vehicle's risk). Accredited must post collateral again the MV swap, just like they post against the collateral on a warehouse line. The structure issues highly rated CP (from overnight to longer terms) and up to \$80 million of BBB-rated term securities. To protect the BBB securities (and the CP), there is a 2.1% reserve account, funded by 3% of excess spread (the funding of these loans is at LIBOR flat, and the coupon is around 8% - therefore that excess is used to fund this reserve account, which protects the BBB and allows them to be IG as well). At the time of the meeting, the whole \$80 million of credit enhancement (e.g. the BBB securities) that should support the whole \$2.5 billion facility were supporting only the \$360 million of CP outstanding, a very large cushion for the CP holders. As I understand it, the paper was being rolled daily by the customer (Lehman had not purchased the paper back). If the CP was not rolled, then there was a 30 day cure period in which Accredited needed to pay back the CP holders, and then there was a 120 day extension period. At the end of the meeting, Jeff and Madelyn noted that they were choosing not to roll the paper at the end of the day, effectively putting Accredited on notice that it had to repay the loan. Subsequently that day, Lehman decided to buy the paper back, and the structure was later unwound (the vehicle never missed a maturity date, or needed to cure. It was just terminated). The vehicle is still somewhat active, however, as the BBB securities are still outstanding. There is negative carry, then, basically between the coupon on the BBBs and the money being made on the cash sitting in the vehicle. Lehman made this prefund this negative carry with \$2 million when they paid off the CP. Although this sounds somewhat trick, the economics look very much like a standard warehouse line – the structure just provided cheaper funding for Accredited (CP is cheaper than warehouse rates).

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Accredited was to have securitized \$200 million in loans, and between the cash securitization price and financing the residual they would have been able to clear an above-par price, but they were unable to file their 10-K which means that they can't securitize. Now, they will probably just sell loans for cash. They have residuals which they have been financing, and they can sell for hard cash. (As Jeff explained it, if they are financing them for 50 cents/dollar, and can sell for 75 cents, that's 25 cents more in the door). They also reached out to FBR to find sources of financing. Lehman was looking to take over the servicing on some loans through Chase as

Deleted: Again, I'm not exactly sure why they get to make the decision since they are not holding the paper, a client is, but this is something to follow up on as well. This may have some reputational implications for Lehman, as this could be the move that puts Accredited under. ¶

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Aurora is just beginning to enter the subprime servicing space. If Accredited fails to meet a margin call, then they can seize the collateral but would prefer to have a more amiable handover. There is also a \$400 million line with \$300 million exposure with Fieldstone (who will most likely be sold to C-Bass), with \$157 million in net exposure. They also met a \$3 million call the day prior to the meting.

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- Lehman has hired approximately 100 former MLN brokers. Jeff is unsure where they will be located – we think BNC.

## CREDIT RISK (STEVE SIMONTE, PATRICK MCGARRY)

### Commitments (Patrick McGarry)

- The commitment discussion was quite brief, as Madelyn came in just as it was getting started and began a discussion of the new format. As mentioned previously, she is no longer briefing the Risk Committee with the Firmwide Risk Snapshot. This apparently had too much of a focus on leveraged loans. In addition, the Firmwide Risk meeting has been moved to Monday, where it follows the Management and Executive committee meetings. There is now a new, one-page “Aggregated Risks” snapshot which gives overall RA usage, VaR usage, HY and HG total commitments (and funded amount), and highlights certain topics in greater detail. In the February 26 snapshot that we discussed, four topics were highlighted: Mortgage counterparty risk, ABS CDO warehouse lines, Innkeepers USA Trust Deal (acquisition financing) and Beacon Capital Strategic Partners Fund III (real estate financing). Madelyn stated that this enables deeper conversation around the relevant topics, and makes people aware of large positions. The relevant risk-takers are invited to the meetings to “add flavor” (e.g. Dave Scher, Mark Walsh, Pat Whalen, Alex Kirk).
- We asked about TXU, which was not on the snapshot. Madelyn said that it wasn’t for the simple reason that it had just been discussed in two Sunday meetings prior to the production of this report, and she didn’t think it needed to be added. They are providing \$4 billion in financing, and Lehman is contributing \$500 million as a private equity investor. Patrick mentioned that he liked TXU and thought it was a good sign that Lehman was also a private equity investor in this deal.
  - We discussed the fact that we will need something with a little more granularity, in addition to the new snapshot. We mentioned that while we appreciated why TXU was not on this page, we would need to know about deals of this size and have some way of tracking them. It sounds like they may still be producing the old snapshot, which might be a good supplemental report.
- There was also a \$1 billion Pinnacle Foods Deal for acquisition financing, which has been getting good feedback in the market.
- Madelyn noted that they had recently passed on a 9x leverage deal, as they were not comfortable with the structuring.

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Counterpart Credit Exposure (Steve Simonte)

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- CE ticked up to \$28 billion, reflecting some seasonality around the dividend season in Europe, when stock lending rises. 3.4% of CE is to non IG names, and Steve again mentioned how they are focused on getting that up to 4% in line with the mandate to take more risk. The business initiatives that are expected to increase credit exposure include commodity trading, emerging market activity, and increasing financial sponsor business.
- New non-IG clients on the top 10 list include: CMA CGM SA (shipping company – Lehman is waiting for a netting opinion), Core Laboratories (own of these issuer call spread transactions that Steve considers virtually risk-free), Fairfax (Citadel) – from TBA trading (Fairfax is a clearing member of MBSCC, and Steve said you can't recognize that collateral as offset and you don't take margin in excess of exchange requirements unless you clear for someone. Also, I believe that there is a \$10 million threshold with this CP. CE was \$35 million), LS Power Acquisitions (five year heat rate option deal – purchase of Texas plants from Mirant. This is smaller than Tenasca (250 MwH), and Lehman has a first lien. The power and gas legs are booked separately so it looks like there is no netting agreement, but there is no netting question since the trade is on one conf irm.).
- We discussed BH Finance, to whom Lehman has a CE of \$536 million and a MPE of \$781 million. Lehman purchased long-dated vol from BH, who has been selling long-dated (15-20Y) puts on the Eurostoxx. They look at this as an insurance business, where BH gets the premium upfront and invests the proceeds.
- We also discussed GS Liquid Trading Opportunities, a fund that does TBA trading. They are not a clearing member of MBSCC, so Lehman clears on their behalf (they are a fixed income PB client).
- The market turmoil has not had a huge impact on hedge funds. Lehman is on guard with the funds and is diligently marking positions, but so far no one has blown up. The subprime impact on hedge funds has also been generally small. For most funds, investing in subprime is not their sole activity. For the 2-3 funds that are focused on subprime, they are not about to blow up but they are down 10-15%.

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**UPDATE FROM MADELYN ANTONCIC**

- Madelyn gave us an update on current staffing plans. Eduardo Canabarro recently left the firm, which has led Madelyn to rethink the current organization.
  - Jeff Goodman will most likely become head of market risk, as he is comfortable dealing with the business heads.
  - Paul Shotton, who prefers the quantitative aspects of market risk management, is moving to a sort of CAO role (although Lisa, to the best of my knowledge, is still the official CAO). He will be responsible for backtesting, reconciliation (with middle office?), regulatory reporting for both market and credit risk, risk aggregation/risk appetite, policies and

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procedures, limit monitoring/documentation, and technology. Paul also wants to have model validation and risk analytics, but Madelyn thinks that is a bit much to have under one person. Madelyn mentioned that she still wants some responsibility for risk aggregation to lie with the line risk managers (e.g. Joe Li) – once this new structure is formalized, we should spend some time with market risk to understand exactly who is responsible for what.

- Madelyn is looking to hire a head of model validation (possibly an internal candidate) and a head of risk analytics (ostensibly VaR and PE methodology). She is not sure if these people will report directly to her. Manhua will focus only on analytics, and not on reporting.
  - Madelyn is also looking to hire a new head of credit, and Patrick McGarry may be moving to Tokyo. In Tokyo, she has recently appointed Ken Wong the regional head of risk (both market and credit).
- Madelyn also mentioned that the firm may exceed its VaR limit passively, if market volatility continues (again, the exponential weighting quickly picks up the increased volatility). She commented that the various business heads all seemed quite worried about this and the SEC ramifications of breaching VaR limits, and wanted to know what they had to do to inform us, etc. She told them not to worry, and that as long as limit excessions were documented according to policies and procedures and had proper authorization it was not a problem. We agreed with this, but Madelyn just wanted to note how seriously people take the VaR limit.

#### FOLLOW UP

- Following the departure of a key risk management employee, the Chief Risk Officer is considering a restructuring of the department. We discussed the preliminary plans, and will continue to discuss Lehman's plans to reorganize and hire additional senior personnel.
- Lehman continues to weather the downturn in the sub-prime mortgage market without incurring any material losses. They continue to manage exposure through warehouse lending lines through daily marking of collateral and margin calls. Lehman's two originators, BNC (subprime) and Aurora (Alt-A) are monitoring levels of reserves needed for putbacks. Currently reserves are \$120 million.
- Lehman lost approximately \$90 million at the firmwide level following the equity market sell-off in late February, causing a VaR exception. Much of this was driven by their long equity position, which had grown steadily over the past few months, peaking at \$3.4 billion in delta just prior to the sell-off. Subsequent to the correction, Lehman reduced its long delta position by almost 2/3.

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On February 27, Lehman had a one-day loss of \$80 million, causing a VaR exception at both the division and firmwide

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MONTHLY RESULTS (ED GRIEB, TONY STUCCHIO)

- Lehman had a strong March, with net revenues of \$1.6 billion. Lower revenues in securitization and real estate were offset by strong results in equities, which saw good customer flow on both the cash and volatility desks. Europe had a record, driven by equities. BNC continued to originate about \$1 billion a month.
- Excess cash capital was up to \$7.3 billion, which included a \$2 billion drawdown on a liquidity facility.

RISK APPETITE

- Risk appetite usage was at \$2.5 billion, basically unchanged from \$2.45 million last month. This month, we were briefed off the old Firmwide Risk Snapshot. We also requested the new, more deal-focused snapshot that we received for the first time last month, and received it subsequent to the meeting. While last month's focused on mortgage and lending exposures, this month's referenced the growing rates vega exposure as well as growing equity exposures and significant outright long deltas. Credit curve exposure was also noted.
- Paul also noted that while the businesses have been pushing up again overall VaR limits (limit is \$85 million, intramonth high was \$82 million), Lehman retains a good deal of RA headroom. He noted that if you constrain VaR too closely, then there is an incentive to take less liquid risks that would not be captured by VaR (but would, ostensibly, be captured by the event risk calculation). However, there seem to be concerns about raising VaR limits because then a higher VaR would have to be reported, which would signal more P&L volatility. We'll keep apprised of these sorts of discussions.

MARKET RISK (PAUL SHOTTON)

- VaR ended the month at \$65 million, up slightly from last month (\$60 million). However, it hit an intramonth high of \$82 million, driven in part by an increase in equity delta. At the end of the month, Lehman was long \$2.1 billion which was a 50% increase from last month (\$1.4 billion). Intramonth, they hit a peak of \$3.3 billion which contributed to the VaR high of \$82 million. GTS alone increased their equity delta to \$4.4 billion (note: we cannot see this anywhere on our reports, as the equity breakdown only includes the customer trading businesses. Also, the VaR for this businesses ended the month at \$14 million, up from \$12 million last year. This is an area to discuss next month, and in addition, when we revisit the metrics provided to us we need more breakdown on GTS).
- IMD and IBD grew their non-core exposures. In IMD, a \$150 million PIPE exposure has shifted from a private to public position, and is now included in internal VaR

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Deleted: <#>February was another strong month, with net revenues of \$1.647 billion (still up compared compared to average month 2006). ¶ <#>Fixed income was up versus average month '06, on the back of strong customer activity. Real estate revenue was at \$281 (compared with average month 2006 (avg 2006) \$142). Securitized products were down 60% versus avg 2006.¶ <#>Equities revenues were up significantly again versus avg 2006 (\$411m for Jan. versus \$297 average). The business was strong across the board, globally.¶ <#>Investment banking was basically flat when compared to avg 2006. Advisory fees were down 13%, and equity origination was down despite more favorable equity markets. Debt origination was strong due to leveraged finance deals¶ <#>Within IM, AUM climbed by \$1 billion to \$236bn. A few days prior to the meeting, IM closed on its investment in DE Shaw, which had been discussed in prior memos. ¶ <#>LBI saw a fairly sizable decrease in net revenues, at \$260 million compared with avg 2006 of \$542 million. This was due to a write-down of NIMs and residuals. LBSF had the hedges and recorded the gains, but due to the split hedges issue LBI registered a loss. ¶ Laura and Tony noted that firmed had applied to open LB Canada in Toronto – this would be primarily an investment banking branch, initially capitalized with around \$15-20 million. Treasury was meeting this week to determine how to fund it. This has not gone to the NPC committee yet, I think because they were waiting for Canadian approvals first.

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(although not in regulatory VaR, which I believe means that it is still a banking book position. It might be worth getting a quick review on positions not in regulatory VaR but included in internal VaR). In addition, market risk is working to include the hedge fund investments (e.g. Spinnaker) into VaR. This would not be used for capital purposes – only internal risk management. They would proxy the positions to a traded HF index. We asked about this, and mentioned that basis risks that such a mapping would incur. Paul seemed to acknowledge this, and we asked who had requested this process to go forward. It did not appear that the business did, but rather risk management. It’s hard to imagine anyone gaining comfort from VaR in this area, so we’ll continue to discuss internal risk management of these direct investments in hedge fund managers.

- FID: VaR fell from \$50 million to \$40 million.
  - Lehman decreased their long credit exposure across the board, ending the month at long \$14.7 million. The auto and home builders sectors were down in March, and spreads widened out in CDS, possibly setting the stage for robust CDO issuance. March was the second heaviest month for HG issuance.
  - Whole loan positions increased, and they continued to hedge with short positions (again, we need to add something to the packet which will allow us to see the whole loan inventory, preferably broken down in by prime, Alt-A, etc).
  - The short swap spread position increased \$14.7 million/bp (from \$11.5 last month). In addition, rates volatility increased from \$93 million to \$106 million, with most of the outright positioning coming from the Europe swaptions vega book (Europe at an aggregate level is long \$66 million). Paul stated this as going from \$82 million to \$96 million – his numbers are always \$10 million lower – while I believe we have discussed this before we may want to ask again what drives this difference. This long vega position tends to provide a hedge fo the long credit exposure, and it was this affect that led to the decline in FID’s VaR.
  - While Lehman ended February more or less flat rates across the globe, they were net long \$260k/bp by the end of March. This was through a combination of long USD and Sterling and short Yen (\$710K) and Euro (\$584) positions.
  - EMG: Emerging markets is no longer its own category – it is now being captured through HG, HY, and CDO (all within credit markets). FX is within rates, sovereigns are within HG, corporates are within HY, structured emerging markets and credit derivatives are within CDO. Mo (the new overall head of emg positions) gets his own “shadow” EMG VaR for his purposes. In another few months, we should meet with Mo – it sounds like they are almost complete with this realignment of EMG management.
  - Paul stated that the yen carry trade was back on with a vengeance. He also noted that with some EMG currencies (Brazil and Turkey) the implied

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volatility curves were more upward sloping, signaling some risk aversion. Lehman's net EMG position was only long \$15 million. Brazil was cut from long \$150 million to long \$28 million, and there were no individual positions over \$100 million (the biggest long was a \$50 million in the Ruble and the biggest short was a \$71 million short on the Korean won). Paul noted that the traders are somewhat hesitant about understanding where the market is headed, and uncertain about future Fed actions.

- Equities: VaR increased from \$15 million to \$19 million, led by the increase in delta (moving into April, equity delta was fluctuating in the \$3 to \$3.5 billion range). Most of the increase came from Asia, where Ben Fuchs remains bullish (he had stepped back, but that was just a temporary decisions). His delta is up \$550 million. In addition, Asia was less long gamma at the end of the month (as was the equities business as a whole).
  - There were 10 block trades, with the largest being Lennar at \$800 million. At the end of the month, \$200 million was left, but this was gone by our meeting. There was also a \$153 million Aspen Insurance block that was only down to \$138 by the time of the meeting, and in a late April risk snapshot the position was still at \$140 million (up slightly even). Paul said that you can't really sell this position without tipping the market, but it would seem that they are having some difficulty unloading this one.
  - The firmwide risk report noted that as of mid-April, Lehman was long \$178 million in China-related stocks.
- Backtesting
  - There were two exceptions in high grade trading – one a loss of almost \$30 million resulting from spread widening in the autos and home builders (RESCAP, Ford Motor Credit) and another loss, about \$10 million, resulting form a 130 bp widening in Beezer Homes, as well as widenings with KB Homes and DR Horton.
  - The same day as the large exception in HG, there was an exception in CDO global, when the CDX IG widened by 3 bps (and GM and Ford both widened by approximately 70 bps).
  - GTS had an exception on the same day, when they lost \$11.5 million on the back of widening in autos.
  - Volatility flow had an exception which resulted from the hedging of OTC derivatives with exchange traded products. By policy, Lehman marks to exchange close, which apparently can sometimes not be a “good” mark. It sounds as if the P&L rights itself the following day as the exchange catches up.
- Scenarios: Max scenario losses were lower across the board – the highest loss was \$1.8 billion, incurred by the 87 equity crash. The next highest loss was \$1.2 billion, resulting from the HY/LBO/default risk scenario and also from the Black Monday scenario.

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## CREDIT RISK (STEVE SIMONTE, PATRICK MCGARRY)

### Commitments (Patrick McGarry)

- The pipeline remains very strong with a long list of potential commitments. Patrick reported that covenant lite is still the theme. There is some evidence of pushback, as Lehman is pushing for flex for longer-dated deals. However, most deals are hard underwritten.
- Deals have been pricing wider than expected but still within the cap. Recently, pricing has been downgraded for deals (more than one?) because of ratings downgrades. Pinnacle Foods was downgraded after the announcement of its acquisition by Blackstone. We will follow up on the results of the syndication at the next meeting.
- Other notable deals in the pipeline at the end of March include:
  - Sallie Mae (Conditional commitment, 33% deal probability, \$23.5bn): Lehman was involved with a party that was not ultimately successful in bidding to acquire Sallie Mae. Lehman looked at the transaction basically as secured lending. They felt that Sallie Mae's student loans are good collateral that would ultimately be securitized. Lehman would have had no outright credit exposure from the transaction, as the loans would be financed through the warehouse lines with good haircuts. Incidentally, Lehman owns two student loan originators, Campus Door and Liberty, but they engage in private lending not government backed lending like Sallie Mae.
  - PHH Corporation (Mandated commitment, 90% deal probability, \$1.83bn): This commitment is for financing of a prime mortgage company being purchased by Blackstone.
  - Dollar General (Mandated commitment, 90% deal probability, \$1.015bn): This commitment is for financing for KKR's acquisition of Dollar General. Dollar General is a "retailer in turnaround" and the deal maxes out the leverage. Lehman got comfort in the deal based on good first quarter numbers from Dollar General. We will continue to follow up on the progress of this deal.
  - Delta Airlines (Mandated commitment, 50% deal probability, \$417m): This commitment is for mandated financing.
  - ProSieben (Mandated final docs, \$1.372bn): clarify details with Patrick
  - Coeur Defense (Mandated final docs, \$2.8bn): This commitment is for the purchase of a single landmark building in France with a 76% LTV. The commitment represents concentrated risk, but Lehman was confident in the building's fundamentals. The financing includes a \$400m bridge equity piece.
  - Formula One (Mandated final docs, \$639m): This financing should be syndicated by the end of the month or the early part of May. We will follow up at our next meeting.

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<#>The commitment discussion was quite brief, as Madelyn came in just as it was getting started and began a discussion of the new format. As mentioned previously, she is no longer briefing the Risk Committee with the Firmwide Risk Snapshot. This apparently had too much of a focus on leveraged loans. In addition, the Firmwide Risk meeting has been moved to Monday, where it follows the Management and Executive committee meetings. There is now a new, one-page "Aggregated Risks" snapshot which gives overall RA usage, VaR usage, HY and HG total commitments (and funded amount), and highlights certain topics in greater detail. In the February 26 snapshot that we discussed, four topics were highlighted: Mortgage counterparty risk, ABS CDO warehouse lines, Inkeepers USA Trust Deal (acquisition financing) and Beacon Capital Strategic Partners Fund III (real estate financing). Madelyn stated that this enables deeper conversation around the relevant topics, and makes people aware of large positions. The relevant risk-takers are invited to the meetings to "add flavor" (e.g. Dave Scher, Mark Walsh, Pat Whalen, Alex Kirk). ¶

<#>We asked about TXU, which was not on the snapshot. Madelyn said that it wasn't for the simple reason that it had just been discussed in two Sunday meetings prior to the production of this report, and she didn't think it needed to be added. They are providing \$4 billion in financing, and Lehman is contributing \$500 million as a private equity investor. Patrick mentioned that he liked TXU and thought it was a good sign that Lehman was also a private equity investor in this deal. ¶

<#>We discussed the fact that we will need something with a little more granularity, in addition to the new snapshot. We mentioned that while we appreciated why TXU was not on this page, we would need to know about deals of this size and have some way of tracking them. It sounds like they may still be producing the old snapshot, which might be a good supplemental report. ¶ <#>There was also a large Pinnacle Foods Deal, which has been getting good feedback in the market (size?). ¶ Madelyn noted that they had recently passed on a 9x leverage deal, as they were not comfortable with the structuring.

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## Counterpart Credit Exposure (Steve Simonte)

- Current exposure declined by \$1.2bn to \$27.3bn driven by a decline in stock loan/borrow balances. The increase in stock loan/borrow activity had been a result of dividend season in Europe and is expected to tick up again next month. The percentage of exposure from investment grade counterparties remains at 97%. Again, Steve said that they expect that number to increase at some point in the future from the new initiatives that the firm is proposing, including commodities, hedge funds, and derivative activity from leveraged lending clients.
- The top 20 counterparties by CE remains the usual suspects. New on the list this month is Deutsche Bank (\$224m CE, CDS, IR derivatives), Fortis Bank (\$201m CE, overcollateralized stock borrow), Pioneer Funds (\$192m CE, stock borrow), and Morgan Stanley Capital Services (\$178m CE, interest rate and credit derivatives).
- MedImmune is also on the top 20 list with a CE of \$143m and a MPE of \$336m. This is a call spread option transaction, where Lehman is long an OTM call on issuer stock. Lehman gains exposure as the stock price increases. With the recent announcement that AstraZeneca is purchasing MedImmune, the stock price has risen dramatically causing an increase in CE. If the buyout goes through, the trade will be unwound. Subsequent to our monthly meeting, we had a phone call with several people from Lehman, including Tony Stucchio and Steve Simonte, to discuss the capital charges associated with this position. The position is booked in LOTC. OPSRA staff agreed to a revised capital methodology for call spread option positions, as outlined in an email from Tony on 4/30/07.
- The top non-investment grade counterparties remains basically the same. The Central Bank of Columbia is #10 with a CE of \$11.4m from secured borrowing transactions, with JP Morgan as the agent. This counterparty appears on the list as a result of the agent lender disclosure project discussed in previous memos, which gave Lehman a better view into their counterparties. The disclosure project resulted in credit analysts needing to rate a couple of hundred additional counterparties (after materiality considerations). Steve requested an additional 2.5 FTE analysts, and they were approved to add 1.
- A new name on the top IG clients by MPE is Royal Bank of Scotland (MPE \$851m from fixed income derivatives and CDS).
- New names on the top non-IG clients by MPE are Capula Global Relative Value Master Fund (MPE \$59m from repo activity) and LS Power Acquisition Co. (MPE \$57m). The former is a hedge to lock in the rate of an ABS securitization that is coming out in April.

## **FOLLOW UP**

- Lehman's firmwide VaR hit an intra-month high of \$82 million, just below their limit of \$85 million, before ending the month down at \$65 million. Even as VaR has risen over the past few months, the firm has remained well under its risk appetite limit, which represents the aggregate amount of market, event, and counterparty credit risk

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that Lehman is willing to take. The head of market risk noted that while the VaR limit effectively constrains the business' ability to take risks in liquid products, traders who still wish to increase their risk-taking activities could do this through more illiquid products, which are captured through the event risk calculation rather than through VaR. By moving into more illiquid areas, a trader could take more risk while remaining within their VaR and risk appetite limits. Market risk management understands that the potential for creating perverse risk-taking incentive exists, and will continue to monitor VaR usage closely.

- Lehman's pipeline of commitments continues to grow and credit risk managers do not anticipate a slowdown in the near future. The size of potential commitments also continues to grow, with Lehman-backed sponsors bidding unsuccessfully for the \$24 billion Sallie Mae deal. Activity in commercial real estate remains robust, especially in Europe where Lehman is providing \$2.8 billion in financing, including \$400 million in bridge equity, for a single building in France.

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VaR

Firmwide VaR peaked at \$72 million in February, driven primarily by an equities net long delta of \$3.6 billion. VaR fell sharply at the end of the month as traders cut pack on their positions in light of the falling equity markets, and was down to \$59.4 million by the end of the month. On the 27<sup>th</sup>, there was a one-day loss of \$80 million, which essentially caused a VaR excession at both division and firmwide levels.

On a month-to-month comparison, the biggest driver of change was FID, whose VaR rose by \$10 million to end the month at \$50 million. VaR increased within Securitized Products, from \$12 to \$20 million. This was primarily driven by an increase in market volatility which was picked up quickly due to Lehman's use of exponential weighting in their VaR methodology. In addition, spread exposure increased by \$1.2 million/bp to \$7.9 million. Paul noted that Lehman has some positions (e.g. Alt-As) conservatively proxied to the time series for home equities, where the time series is more volatile than the actual position. They are reviewing those mapping decisions in light of recent ABX volatility. VaR was also up for credit products on increased spread exposure, ending the month \$3.4 million/bp longer, at \$12 million/bp (can't see this in packet). FX VaR fell on the reduction of the net long foreign versus USD position, ending the month mostly flat (short \$13 million versus ending last month long \$110 million). They went long EMG into February 27 (Russia, Turkey, etc), and lost money on these positions. However, they were able to reverse their longs quickly – for example, in Turkey they began the month long \$134 million but ended short \$54 million (packet showed short \$60 million). Rate exposure was not a big driver of risk this month – there was a curve exposure trade in USD, and a smaller trade of this nature in the Euro and GBP. For this trade, they were long the short end (2-5 year) and short the long end (10-30). The long volatility position was increased by \$15 million overall (\$12 million in packet), with Europe holding most of the outright long vol positions.

In equities, outright net long delta moved through out the month, beginning at \$2.5 billion, peaking at \$3.6 billion, and ending at \$1.4 billion. They ended the month net long gamma and net long vega. Behind that, they had increased net gamma by 85% to \$585 million at the end of the month, and reduced the outright long vega positions, ending at \$7million/vol point. The combination of a reduction in vega, a reduction in delta, and an increase in gamma all led to a reduction in overall VaR, as the Equities division VaR fell from \$18.7 million to \$15 million. Block trade activity was strong throughout the month, with investors looking to monetize positions. Lehman won 14 deals, with the largest being \$422 million of Owen Semiconductor, and only three deals over \$100 million. In total, the desk made \$18 million in profit throughout the month.

The desk did still have \$153 million of Aspen Insurance (out of a \$250 million block) at the time of the meeting (or the end of the month?).

GTS did not have many changes during the month. They had a profitable quarter with positions on merger arbitrage. Paul noted that when the market sells off, the risk of deal break increases. GTS has now closed out their GM positions, although they still have a big position in GMAC. They do some relative value trades (merger arb) where they are long the target but the acquirer is a sponsor, so the position is not hedged. In March

Overall, markets were benign until the end of the month, with credit spreads tightening and treasuries down slightly. However, when China sold off 9%, Greenspan spoke about a possible recession, and durable goods were weak, the markets got spooked and, among other things, began the unwind of the Yen carry trade, causing a rally in the Yen versus USD. In the last days of the month, there was a flight to quality, and credit spreads widened. The CDX IG widened by 24%, closing at 33. Paul noted that the most liquid options moved faster – i.e. the index widened first, followed by single name CDS and then by cash.

#### Backtesting

There was one firmwide exception on February 27, with a loss around \$95 million. As mentioned previously, this was driven by equities.

#### FID

Liquid market prop had an exception on the 27 when Treasuries rallied in a flight to quality, hurting their short rate exposure. They also were long equity delta (we haven't really focused on this – how much equity trading is LMP doing? Tend to think of this as John Hoffman's trades, which are in the rates space).

High grade had an exception on the 27, when they went in long credit and the CDX widened by 24%. The GM (ResCap) position caused some pain, and it was subsequently trimmed.

Munis had an excession on the 27 – the usual muni/treasury basis story with munis lagging treasuries, and the loss was followed by a large profit the next day.

FX almost had an excession from the EMG positions, but the last two days of the month were profitable as the desk quickly cut their positions.

Equities global lost \$80 million on 2/27, which was offset to some extent by intraday P&L (Paul didn't know how much intraday P&L there was)

Cash products, volatility flow, equity strategies, and systematic trading had 2/27 excessions – no additional color provided.

Equities volatility had a loss on the 27 from Hong Kong, which had a net long Asia position. However, the next day there was a huge profit (about \$27 million ) from the spike in volatility, as the long vega position was marked up. Ben Fuchs is still overall bullish on Asia.

Equities portfolio had purchased a large blind risk basket on 2/26, purchased at a discount of \$3.5 million. This position caused a VaR excession on 2/27, contributing to a groupwide loss of around \$8 million.

Event driven had an excession on the 27. Paul mentioned that while most of the trading is around announced deals, some is on possible takeover targets, also known as “rumortrage.” We had actually discussed this at Lehman a while ago after we learned the term “rumortrage” at BS, and Paul said the desk only trades on announced deals, and that you can’t make money trading on speculation unless you have inside information. The desk (and Paul) seemed to have changed their opinion on that one.

Equity syndicate had an excession on 2/27 from the Aspen Insurance block position, mentioned above.

Mortgage trading had three chunks of losses through January, all resulting from write-downs (on whole loans or residuals? – we can follow up at March P&L meeting)

Energy suffered a number of loss days (in the \$2 million range) due to oil and heat rate options

Scenarios

The worst case loss was again from Equity Crash, which was down to \$1.9 billion (down from \$2.25 billion last month). EMG also had a big reduction (\$1.7 down to \$1.4 billion), as did parallel move down (\$1.5 to \$1.2 billion), Black Monday (\$1.7 to \$1.2 billion). Losses were down in the scenarios due to reduced equity delta and no large rate exposures – i.e. the short bias which has been on for some time was flattened. The most painful scenarios are those with a flight to quality and bull stepping in rates (which will hit short rate positions). Liquidity crunch was essentially unchanged at \$1.5 billion (ask about this next month – why did the delta reduction not affect this one?).

#### **UPDATE ON SUBPRIME MORTGAGES (JEFF GOODMAN)**

Jeff again reiterated that it costs about 1 ½ points to originate a loan, and subprime loans are now selling under par – effectively causing the originators to lose loans they’re making. Combined with losses from EPDs (upfront) and reps and warranties (later in the life of the mortgages), it’s become extremely challenging for the originators to survive. Jeff did note that with the consolidation in the industry, even in the face of the meltdown, the pricing power was beginning to return to the originators. The strategy of cutting rates to drive other originators out of business is no longer feasible, and the originators left are raising rates so that they can clear loan sales at profitable levels. However, Jeff noted that it is still difficult for all parties to see the cash exit price given the current market dislocation.

Lehman recently included their MLN collateral in a deal last week and were able to sell off the most, if not all, of the capital structure (including BBB pieces) Interestingly, Jeff noted that since MLN is bankrupt, the collateral was sold with Lehman guarantees, which actually makes it easier to sell (i.e. it’s hard to sell the collateral of a rapidly failing company, who still makes the guarantees but may not be around to honor them, than the collateral of an already defaulted originator, in which case the seller guarantees the loans).

The cash spreads on subprime are starting to slowly catch up with the synthetic space. Spreads on BBB were at 800, and spreads at BBB- were at 1000 (although it’s worth

noting that the ABX BBB- had broken the 2000 mark). Market participants are taking both sides of the ABX – Jeff noted that at these levels, people are willing to buy and sell. He also mentioned that there were many ABX relative value trades going on (ABX versus CDO, versus single-name CDX).

Lehman currently has \$216 in reps and warranties claims, mostly from EPDs. They are estimating a \$46 million loss on this (this includes \$20 million from MLN, which has not changed from last month). The whole loan desk has a reserve of \$79 million against this estimate.

BNC and Aurora have taken reserves of \$120 for putbacks – these reserves are currently being reviewed and may be increased by \$20 million. We'll discuss this with Gerry Riley during our next P&L review.

ResMae losses, stemming from the warehouse line, are estimated to be \$15-20 million, assuming no recovery from the counterparty.

The repo desk is financing \$3.7 billion of sub-prime securities (\$754 million BBB or below), which are being repriced constantly. So far, all margin calls have been met.

Lehman has less than \$2 billion funded on all warehouse lines, under about \$5 billion of commitments (ex-BNC). Most of this is with subprime (\$700 million is to Alt-A). Lehman continues to mark the lines daily at marks that they can live with if forced to take the collateral. One of the larger lines was a \$1.5 billion commitment to Option One, owned by HR Block. The line is now down to \$1.1 billion, of which \$450 million is funded. This line has a change in control provision in the contract, so when Option One is sold (it is currently on the block), they either have to pay, or, more likely, renegotiate the facility terms. Lehman also has a \$500 million line with Accredited, on which \$390 is drawn (\$270 million of which was net funded by Lehman, there seemed to be another participator in the line). The day before the meeting, Accredited met a \$5 million margin call.

Lehman was also the original structurer of Carmel Mountain, an extendible ABCP facility for Accredited. This is a \$2.5 billion facility, although it only has \$360 million in collateral in it and \$250 million of CP outstanding (i.e. very overcollateralized). There is also a market value swap on the facility, which is intended to protect against market risk, or a decline in the value of the collateral – essentially a put. The notional on this swap is

Page 3: [3] Deleted danism 5/1/2007 10:33:00 AM

, and it was syndicated to 5 dealers, including Lehman, leaving Lehman with a notional of \$500 million. The CE is \$72 million on this swap (

Page 3: [4] Deleted danism 5/1/2007 10:33:00 AM

1/5 of \$360), but this is a slightly different version of CE – it is akin to the funded amount on a warehouse line. It covers only a drop in market value, and not any credit risk (i.e. if loans are delinquent, that is the vehicle's risk)

Page 3: [5] Deleted danism 5/1/2007 10:33:00 AM

. Accredited must post collateral against the MV swap, just like they post against the collateral on a warehouse line. The structure issues highly rated CP (from overnight to longer terms) and up to \$80 million of BBB-rated term securities. To protect the BBB securities (and the CP), there is a

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– this seems like a slightly different usage of “CE” than I normally associate with a swap		
Page 3: [7] Deleted	danism	5/1/2007 10:33:00 AM
2.1% reserve account, funded by		
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of what? this might be a reserve fund, where cash flows go first before being distributed to investors		
Page 3: [9] Deleted	danism	5/1/2007 10:33:00 AM
the funding of these loans is at LIBOR flat, and the coupon is around 8% - therefore that excess is used to fund this reserve account, which protects the BBB and allows them to be IG as well).		
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At the time of the meeting, the whole \$80 million of credit enhancement (e.g. the BBB securities) that		
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support the whole \$2.5 billion facility		
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were supporting only the \$360 million of CP outstanding, a very large cushion for the CP holders.		
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(who provides this?) Jeff put total exposure at \$340 million.		
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was being rolled daily by the customer (Lehman had not purchased the paper back). If the CP was not rolled, then there was a 30 day cure period in which Accredited needed to pay back the CP holders, and then there was a 120 day extension period.		
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I’m not sure I fully understand this structure; we probably want to have a follow-up call with Jeff to walk through it again (scheduled for Monday 3/26).		
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At the end of the meeting, Jeff and Madelyn noted that they were choosing not to roll the paper at the end of the day, effectively putting Accredited on notice that it had to repay the loan. Subsequently that day, Lehman decided to buy the paper back, and the structure was later unwound (the vehicle never missed a maturity date, or needed to cure. It was just terminated). The vehicle is still somewhat active, however, as the BBB securities are still outstanding. There is negative carry, then, basically between the coupon on the BBBs and the money being made on the cash sitting in the vehicle. Lehman made this prefund this negative carry with \$2 million when they paid off the CP. Although this sounds somewhat trick, the economics look very much like a standard warehouse line – the structure just provided cheaper funding for Accredited (CP is cheaper than warehouse rates).		



Again, I'm not exactly sure why they get to make the decision since they are not holding the paper, a client is, but this is something to follow up on as well. This may have some reputational implications for Lehman, as this could be the move that puts Accredited under.

Accredited was to have securitized \$200 million in loans, and between the cash securitization price and financing the residual they would have been able to clear an above-par price, but they were unable to file their 10-K which means that they can't securitize. Now, they will probably just sell loans for cash. They have residuals which they have been financing, and they can sell for hard cash. (As Jeff explained it, if they are financing them for 50 cents/dollar, and can sell for 75 cents, that's 25 cents more in the door). They also reached out to FBR to find sources of financing. Lehman was looking to take over the servicing on some loans (although I think through JPM, as Aurora is just beginning to enter the subprime servicing space). If Accredited fails to meet a margin call, then they can seize the collateral but would prefer to have a more amiable handover. There is also a \$300 million line with Fieldston (who will most likely be sold to C-Bass), with \$157 million in net exposure. They also met a \$3 million call the day prior to the meeting.

Lehman has hired approximately 100 former MLN brokers. Jeff is unsure where they will be located – we think BNC.

CE ticked up to \$28 billion, reflecting some seasonality around the dividend season in Europe, when stock lending rises. 3.4% of CE is to non IG names, and Steve again mentioned how they are focused on getting that up to 4% in line with the mandate to take more risk.

New non-IG clients on the top 10 list include: CMA CGM SA (shipping company – Lehman is waiting for a netting opinion), Core Laboratories (own of these issuer call spread transactions that Steve considers virtually risk-free), Fairfax (Citadel) – from TBA trading (Fairfax is a clearing member of MBSCC, and Steve said you don't take margin in excess of exchange requirements unless you clear for someone. Also, I believe that there is a \$10 million threshold with this CP. CE was \$35 million), LS Power Acquisitions (five year heat rate option deal – purchase of Texas plants from Mirant. This is smaller than Tenasca (250 Mwh), and Lehman has a first lien).

We discussed BH Finance, to whom Lehman has a CE of \$536 million and a MPE of \$781 million. Lehman purchased long-dated vol from BH, who has been selling long-dated (15-20Y) puts on the Eurostoxx. They look at this as an insurance business, where BH gets the premium upfront and invests the proceeds.

We also discussed GS Liquid Trading Opportunities, a fund that does TBA trading. They are not a clearing member of MBSCC, so Lehman clears on their behalf (they are a fixed income PB client).

## UPDATE FROM MADELYN ANTONCIC

Madelyn gave us an update on current staffing plans. Eduardo Canabarro recently left the firm, which has led Madelyn to rethink the current organization.

Jeff Goodman will most likely become head of market risk, as he is comfortable dealing with the business heads.

Paul Shotton, who prefers the quantitative aspects of market risk management, who moving to a sort of CAO role (although Lisa, to the best of my knowledge, is still the official CAO). He will be responsible for backtesting, reconciliation (with middle office?), regulatory reporting for both market and credit risk, risk aggregation/risk appetite, policies and procedures, limit monitoring/documentation, and technology. Paul also wants to have model validation and risk analytics, but Madelyn thinks that is a bit much to have under one person. Madelyn mentioned that she still wants some responsibility for risk aggregation to lie with the line risk managers (e.g. Joe Li) – once this new structure is formalized, we should spend some time with market risk to understand exactly who is responsible for what.

Madelyn is looking to hire a head of model validation (possibly an internal candidate) and a head of risk analytics (ostensibly VaR and PE methodology). She is not sure if these people will report directly to her. Manhua will focus only on analytics, and not on reporting.

Madelyn is also looking to hire a new head of credit, and Patrick McGarry may be moving to Tokyo. In Tokyo, she has recently appointed Ken Wong the regional head of risk (both market and credit).

Madelyn also mentioned that the firm may exceed its VaR limit passively, if market volatility continues (again, the exponential weighting quickly picks up the increased volatility). She commented that the various business heads all seemed quite worried about this and the SEC ramifications of breaching VaR limits, and wanted to know what they had to do to inform us, etc. She told them not to worry, and that as long as limit excessions were documented according to policies and procedures and had proper authorization it was not a problem. We agreed with this, but Madelyn just wanted to note how seriously people take the VaR limit.

Following the departure of a key risk management employee, the Chief Risk Officer is considering a restructuring of the department. We discussed the preliminary plans, and will continue to discuss Lehman's plans to reorganize and hire additional senior personnel.

Lehman continues to weather the downturn in the sub-prime mortgage market without incurring any material losses. They continue to manage exposure through warehouse lending lines through daily marking of collateral and margin calls. (something about BNC and Aurora

Lehman lost approximately \$90 million at the firmwide level following the equity market sell-off in late February, causing a VaR exception. Much of this was driven by their long equity position, which had grown steadily over the past few months, peaking at \$3.4 billion in delta just prior to the sell-off. Subsequent to the correction, Lehman reduced its long delta position by almost 2/3.

### **MONTHLY RESULTS (ED GRIEB, TONY STUCCHIO)**

- Net revenues during April were \$1.7bn, above average month '07 of \$1.6bn, driven by very strong equities. Equities revenues were \$503m, above average month '07 (\$466m) and well above average month '06 (\$282m) driven by good customer flow in cash products and prime services, especially in Europe. Fixed Income was at \$572m, below both average month '07 (\$660m) and average month '06 (\$670m) Credit products had a good month offsetting a not good month for securitizations. They took markdowns on second lien products (detailed below), while originations spreads remained tight. They booked an \$80m gain from the sale of the Wilshire property in California. Again, non-US revenues were strong – over 40% (they have traditionally run at around 38-40% of overall revenues, but will be up at 40-44% this quarter).
- Investment banking was at \$413m, up over both average month '06 (\$251m) and average month '07 (\$275m). M&A was strong, and the pipeline for both underwriting and M&A is good. They participated in a large IPO in Asia (Seatek??).
- Within Investment Management, revenues were \$259m, slightly above average month '06 and average month '07. AUM was at \$254bn. PIM revenues were strong but activity should be slower during the summer months.
- Long term capital remained steady at \$119bn, with LBI excess capital at \$3.888bn. Net leverage was high at 17.6x due to the timing of an MCAP issuance anticipated for late April being pushed into early May. They were expecting something more along the lines of 16.5x. LBI had higher fail charges in May due to the timing of month end with the May Day holiday in Europe. They are waiting for dividend approval from the NYSE.

### **RISK APPETITE**

- Risk appetite usage was at \$2.725bn, up from \$2.5bn last month. Real estate usage was \$527m.

### **CREDIT RISK**

#### Real Estate Transaction (Jeff Goodman)

- Jeff Goodman briefed us about a large real estate transaction that Lehman could potentially be involved in that may hit the papers next week. The transaction is to take private a large multi-family REIT. The REIT has 88,000 apartments in major markets along both coasts, with the largest concentration being in DC (35% of the properties). Jeff characterized the markets in which the REIT has properties as strong with good rental growth.
- The total financing will be \$23bn, with Lehman the sole provider because of confidentiality concerns. The financing will be broken down as:

- \$500m in permanent GP equity, with Lehman providing half of this amount through a new multi-family fund
- \$2bn in bridge equity, which will be syndicated
- \$2bn in a mezzanine bridge, and Lehman is not sure what they will do with this piece
- \$19bn in bank debt, with a term around 18 months which will be a bridge to the CMBS takeout
- At close of the deal, the plan is to sell \$8-10bn in assets in order to reduce debt. They will then do a CMBS financing to take out much of the debt. Ultimately, the capital structure will be 70% debt and 30% equity. Lehman feels confident in their ability to syndicate this large amount of real estate financings, given their successful track record with transactions such as Gables and CarrAmerica.
- We asked about the impact of this transaction on capital. The capital charge depends on conditionality and timing. We will closely monitor the conditionality clauses in use if the deal is on the books at month end.

#### Counterparty Credit Risk (Steve Simonte)

- Current Credit Exposure increased significantly to \$33.8bn from \$27.3bn, as expected, due to an increase in secured borrowing in Europe around dividend season. The percentage of CCE that is investment grade remains very high at 98%. Steve pointed out that the percentage of CCE that is North America-based is 35% while 52% is European-based. This is due to two factors: (1) the seasonal increase in stock borrows around dividend season; and (2) the agent lender disclosure project has changed the country of origin of CCE from US-based agent banks to the actual lender who are geographically dispersed.
- New names on the top 20 counterparties by CCE include:
  - Kuwait Investment Authority (BBB-, based on the sovereign cap on Kuwait), CE \$532m, PE \$552m: Exposure from borrowing securities through Citi. Lehman does prepays for the borrowed shares, where Lehman pays the cash in the evening and receives the shares in the morning. The exposure is very short-dated.
  - Axa Equity (CE \$346m): stock borrow; Allianz Lebensversicherung (CE \$300m): stock borrow and equity derivatives; Dekabank Dutsche Girozentrale (CE \$293m) stock borrow, the counterparty failed on delivery for one day due to the May Day holiday; Bank of Ireland Staff Pension Fund (\$287m) stock borrow; IXIS (\$231m) fixed income financing and equity derivatives.
- New names on the top 20 non-investment grade counterparties by CCE include:

- Fairfax International Investment (CE \$17m): Lehman clears TBA trades for them. An initiative is underway to have a central counterparty for MBS clearing like DTCC, whereby Lehman would then have exposure to the central counterparty instead of to the counterparty.
- Ramius Securities (\$11m): securities borrowing
- The new top investment grade names by MPE were all names we had seen before, with exposure coming from derivatives trading: Citibank (\$824m), Goldman (\$822m), and Barclays (\$781m).
- The new top non-investment grade by MPE include:
  - American Home Mortgage Investment Corp (\$57m MPE): exposure from forward settlement on home loan purchases
  - Thornburg Mortgage Inc. (\$56m MPE): exposure from collateral callback risk (i.e., Thornburg could call back the collateral they have posted to Lehman)
  - Drake Global Opportunity Fund (\$53m): exposure from futures and Mexican interest rate swaps
  - Caxton International (\$45m): exposure from MBS and derivatives financing
- The new top hedge funds by MPE include:
  - Moore Macro Fund (\$42m MPE): exposure from CDS
  - Millennium Partners (\$40m MPE): exposure from MBS clearing
- New energy exposures including Encana (\$52m MPE) and GS Caltex (\$43m MPE) both result from production hedging.
- During the month, Steve provided us with additional information on hedge fund margin requirements that we had requested.
  - From Steve's email: "As previously discussed, we have adopted a "flexible margin" philosophy. Under this approach, Risk continues to set standard collateral guidelines based on the underlying asset's volatility and liquidity characteristics, but we empower the individual business units to charge margins less than our standard guidelines if required to meet the market-clearing level so long as they stay within the credit limits established and monitored by Risk. Since we calculate our potential credit exposures daily by comparing a volatility and liquidity risk of each portfolio to the actual amount of collateral we hold, trades with below-guideline margin requirements will result in higher credit limit usage. In essence, if we're not changing the client margin, then we're charging margin to the client's credit limit internally. This approach allows the business to efficiently respond to competitive pressures, but at the same time it reinforces our focus on risk and risk-based limits. If the business elects to offer highly competitive margin terms, then they use up their credit limits more quickly and risk running out of capacity. To ensure

that they maximize the value of scarce hedge fund credit limit capacity, it is in the businesses' interests to obtain as much collateral as competitive pressures will permit. Given this flexible margin philosophy, it is possible -- within the constraints of our credit limits -- for the business to execute trades on a no-initial-margin basis with any of our hedge fund clients. In practice, below-guideline levels are most common in government bond repo, foreign exchange and interest rate derivatives, although margins have clearly been under pressure in all product areas.”

- Bridgewater’s FX trades are the only instance of a hedge fund not posting variation margin.
- In the credit derivatives space, Lehman does not require initial margin from Blackrock (indices and low spread names only) and from PIMCO (low levered funds, low spread names) when Lehman buys protection. Both are subject to variation margin.
- The products underlying the reverse repos for which initial margin is not required are mostly treasuries and agencies.
- For FX, market convention is not to receive initial margin. The list of clients provided to us is all of Lehman’s clients, less the dozen that do post initial margin. These clients that do not post are active and Lehman takes a portfolio based approach.
- There is a hedge fund with an unsecured margin threshold greater than \$5m, but it has a unique story. BGI/3D Capital Yen Fund is a JPY denominated feeder fund for a USD denominated hedge fund. Lehman engages in fx hedges with the feeder fund, but the feeder funds have no liquidity as they essentially act as passthrough vehicles for investors investing in the master fund. Lehman gets variation margin in advance from the master fund on behalf of the master fund, which essentially is initial margin.

#### Commitments (Patrick McGarry)

- Patrick reported that markets have started to push back on covenant lite deals, especially for small mid-cap deals (under \$1bn). Covenant lite deals are demanding a 25bp pricing spread.
- The pipeline remains very strong. Several deals have dropped off the list, including Weatherford (\$6.715bn conditional commitment for the TPG take private transaction), Teva (\$3.75bn conditional commitment for the purchase of Merck), US FoodService (\$1.975bn contingent commitment), and Bulgarian Telecommunications (\$1.051bn contingent commitment). [The latter included a “mullet” – Lehman slang for being offered a small piece of the deal.]
- Lehman is potentially involved in a deal with RJ O’Brien, a Futures Commission Merchant. If they get rated a B/B-, Lehman would insist on including covenants in the deal and therefore they may get pushed out as the

sponsor is adamant about not including covenants. Lehman is wary of how investors will perceive a counterparty rated B or B- in this industry.

- The desk feels that there is good visibility in syndication until June, and anything post-June may get more difficult. Ratings agencies are applying pressure to terms and may be the only thing to stop covenant lite deals. That said, Lehman's syndications continue to go well. Bawag (\$1.3bn) is going well, and Lehman is hopeful the Dollar General syndication will go well with the upcoming earnings announcement.
- The Firmwide Risk report highlighted a number of equity commitments and bridges (\$3.4bn as of 4/30, \$1.24bn as of 5/14). Several of the deals include bridge equity pieces that will be syndicated by private equity groups, including KKR and TH Lee (Apollo and Blackston are the other large drivers of private equity syndications). Lehman gets comfort in equity bridges by talking to their own private equity division to get a view on syndication and their view on the specifics of the deal. For example, for First Data (financing for KKR's purchase of First Data, including \$500m bridge equity), the question was whether they could continue double digit growth given their size. The syndication for First Data will be led by KKR, and the agreement is that Lehman can take control if they do not sell within 75 days. This could be problematic in that they would be taking over a bridge that is not doing well.
- Other highlighted deals on the Firmwide Risk report includes:
  - IBM ASR \$12bn bridge financing (Lehman's share is \$4bn) for an Accelerated Share Repurchase program for IBM International Group BV. The bridge loan will be funded towards the end of May and syndicated to an additional 7 banks within one week. Lehman's target hold is 15% (\$1.7bn).
  - Broadway Partners \$3.29bn financing commitment to acquire a sub-portfolio of Beacon. Separately, Lehman is providing \$943m in financing on the Rosslyn, VA sub-portfolio, including \$295m of bridge equity. The investment grade portion of the loans will be securitized in a CMBS in 2Q07 and 3Q07; the B-notes and mezz loans will be marketed to institutional investors; the bridge equity will be redeemed within 6-12 months.

## **MARKET RISK**

### VaR Update

- Firmwide VaR ended the month at \$83.4 million, up from last month's high of \$65 million. During April, it peaked at \$87 million. The increase was primarily driven by an increase in the long equity position, with delta up over 70% from March (from \$2.1 million to \$3.6 million, with an intra-month peak of \$4.1 billion). Paul noted that in general, when equities is very long, the VaR often declines as when equities is long delta FID tends to be long rates, which offset one another. However, FID is



basically flat right now (with some credit exposure), leading to the loss of that diversification effect.

- Within FID, VaR was up slightly at \$43.4 million, from \$40 million last month. Lehman was overall long \$200k/bps in rates, and increased their long in credit spreads by \$3.3 million, ending at \$18.1 million (the increase drove a limit excession in Europ, with a VaR of \$8.6 million against a limit of \$8 million). In rates, they are still long vega, although overall swaption vega fell from \$66 million to \$60 million (we can't see this – another view that we need to request). Much of the cap vega is Euro denominated and coming from London. At month end, Lehman was long \$61 million in Europe versus short \$24 million in USD swaptions.
  - Paul noted that the carry trade was back on with a vengeance, and rates are on hold until Q4 in Japan. Expectations are for a rate hike in the UK and Europe.
  - With respect to the breakdown in liquid markets, Paul noted that High Grade contains EMG sovereigns, HY contains EMG corporates, and CDO contains EMG structured notes (as of two months ago, EMG is no longer its own line).
  - There was a VaR overage in mortgages due to higher volatilities. However, the high vol period is beginning to roll off due to the exponential weighting of the time series.
  - ABS CDO warehouse: Lehman noted that the corporate/CLO/CDO market was still large and viable, while the ABS market was struggling (what we've heard other places as well). They did state that a deal called Ballyrock had just been priced, and that had manage to clear out the underlying tranches (noting that there are some people still willing to take on the supersenior protection). They also sold the equity on a NY Life deal.
  - FX: Delta was up from \$220 million to \$613 million, with a decrease in major currencies delta and a significant increase in EMG currencies (delta went from \$15 million to \$572 million). Vega flipped from short \$1.45 million to long \$3.7 million. Within the majors, the desk was long \$112 million of CAD, short \$285 million of Euro, short \$83 million in the GBP, and long \$239 million in JPY. Within EMG, the desk had a big long in BRL (\$127 million), a short in Korea (\$101 million), and a \$100 million long in RBL.
  - Mortgages: In addition to the backtesting exception caused by a write-down in 2<sup>nd</sup> liens (see backtesting section), Jeff Goodman provided a quick update on the market. He sees some liquidity returning to the subprime space, where some deals are being priced. They are very originator-specific, as the last few months have brought much better collateral. Collateral is tending to get bifurcated into two buckets: good and not so good. The cutback in production is helping originators due to the decrease in supply, but it's still a tough environment for them. The cost to originate a loan goes up with low volumes, as you don't enjoy

economy of scale, but they are at least making some money on origination (although not 1 to 1.5 points like before the meltdown). Lehman has not really been participating in the big subprime whole loan sales (e.g. New Century). In the Alt-A space, Jeff said that these loans are underperforming, but that Aurora can quickly address the pricing, in some cases intraday. The spread widening is occurring from A downwards, as the deals tend to have much less subordination (I think in comparison to subprime). The desk has on TRS on AAA securities as a hedge for this book.

- **From Aggregated Risk Snapshot**, dated 4/23 – the long IRP vega exposure was highlighted, specifically the long sin Europe (driven by cap and swaptions). The potential loss is given as \$70 million in vols fall by 1%, which is the largest 1-week decline over past 5 years. Alt-A mortgage exposure is also discussed (again, we need a snapshot that shoes this sort of info – whole loan inventory, securities, etc). Finally, the snapshot highlights a credit curve exposure resulting from a net steepener in both HG and HY.
- Within equities, VaR rose to \$29 million from \$19 million last month, driven by the delta increase. Bart McDade, the head of equities, does not want to change the current limit (\$35 million) for equities, as he does not want any more exposure.
  - Asia alone had a \$845 million increase in delta, and long vega climbed from \$10.8 million to \$21.5 million (although last month's report aid that vega ended at \$17.6 million, not \$10.8 million). The increase in gamma (\$90 million) was insufficient to offset the large delta increase.
  - The desk did 4 block trades, with the largest being a \$420 million position in Enterprise Partners that is now off the books. There is still a \$134 million position in Aspen Insurance, which has been on for a few months.
  - GTS ended the month with \$4.1 billion delta, which Paul said was up from \$3.9 million (although he told us last month that they ended at \$4.4 billion, and when I mentioned this seemed confused. We're getting a couple of examples of numbers changing month to month). We asked how they could have a relatively small VaR (\$15.4 million) given such a large directional position, and Paul noted that about a year ago, they made a change in VaR methodology to this business. They have modified the time series, effectively giving the prices a floor (assuming that since these names are now in play as M&A names, they will not track their pre-in-play history). Risk of deal break is captured through event risk. We requested to receive the document that market risk (Sandeep) put together detailing this change in methodology – we should probably consider coming up with a more formal process for notifying us of changes in VaR, as they never mentioned this methodology change.
  - **From Aggregated Risk Snapshot**, dated 5/14: Equity exposure stemming from \$4.1 billion in long delta was noted, with a regional breakout (US \$1.4 billion, Asia \$1.3 billion, Europe \$900 million) Note: this doesn't add

### Internal/External VaR Alignment of CSE banking book items

- Following up on some comments made last month, Chris Van Hollen came to speak about the alignment of VaR. For private equity, asset management (direct hedge fund stakes), and JVs, positions show up in internal/external (there is no difference between internal and reported VaR) VaR but are not in the CSE trading book, or regulatory VaR. Also, Chris is not planning on developing a VaR for hedge fund investments – they're looking at some other type of risk metric that would be more appropriate.

### Stress Tests

- The biggest loss is coming from Equity Crash, at \$2.6 billion. The second largest is Black Monday, at \$1.9 billion. In both cases, much of the losses are concentrated in GTS due to their long \$3.7 billion delta (yet another number for them that doesn't match Paul's comments). In Equity Crash, GTS loses almost \$770 million (which is more than the equities division losses of \$748 million), and they lose \$530 million in Black Monday. Also of note, Investment Management loses of \$300 million in both of these scenarios, due to a delta of \$1.4 billion (IM's VaR is \$11.1 million). I'm not sure how/why IM has such a large delta – we'll ask next month.

### Backtesting

- There were a few exceptions in equities cash products which we did not discuss.
- The main story was in Securitized Products, where Lehman took an approximately \$40 million (?) write-down on its second lien book (mostly subprimes and Alt-A). Most of the 2<sup>nd</sup> liens were piggyback loans. There were a spike in delinquencies with this product, mostly no-money-down, low FICO product. The write-down applied to both 2<sup>nd</sup> lien securities and 2<sup>nd</sup> lien funded loans in the pipeline that had been underwritten under old guidelines. This was an example of Demetrius using his “tree structure” to identify problematic loans. Lehman then re-evaluated the forward default curve and repriced the loans, resulting in the loss. Jeff noted that remittances arrive once a month (and with them, defaults), which leads to a lumpy 1-day move as you reassess your default assumption. There will be many market moves around this, and then the market will quiet down until the next month of remittances comes in. In addition to the losses on write-downs, 1/3 of the loss was from hedges against the subprime cash positions as the ABX has come in from 1400 to 1000.

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## **FOR FOLLOW UP**

- Lehman is providing \$23 billion of financing to take a multi-family REIT private. In addition to \$19 billion bank debt, the deal includes \$2 billion in bridge equity and \$2 billion in mezzanine bridge financing. To mitigate the risk, Lehman plans to syndicate a portion of the bridges, to sell properties in order to pay off the bank debt, and to take out the rest via CMBS securitizations. Given the large size of the deal and Lehman's solo role in the process, we will closely monitor the progress of the deal.

## MONTHLY RESULTS (Steve Rossi, Tony Stucchio)

- May 2007 was Lehman's best month ever with revenues of \$2.134bn, up from \$1.817 average month '07 and \$1.535 average month '06.
  - Fixed income revenue was \$773m, compared to \$572m in April and \$546 in March. Revenue was driven by customer business, especially CMOs, credit products and real estate, offset by continued weakness in securitizations. There were some mortgage derivative gains, but not to the magnitude of the first quarter's gains.
  - Equities was at \$628m for the month, up from \$520m average month '07, driven by gains in execution services and prime services.
  - Investment Banking was also strong at \$459m, up from \$333 average month '07. Gains were driven by: \$111m in advisory fees, of which the Bawag acquisition was the largest single transaction; \$108m in equity origination fees; and \$239m in debt origination fees, double average month '06.
  - Revenues in Investment Management were \$274m, up slightly from average month '07. AUM was up 11% to \$263bn.
- On a quarterly basis, revenues were a record \$5.512bn.
  - Mortgage originations rose in 2Q to \$17bn from \$15.2bn in 1Q. However, margins were down due to the predominance of agency securitizations which tend to have tighter spreads. Securitization volume rose to \$37bn in 2Q at an average 32bp spread from \$22bn in 1Q at an average spread of 37bp. For comparison, spreads in 2Q06 were 88bp.
  - Lehman gained market share in M&A during the quarter. They were ranked #6 with a 24.7% share for M&A announced, compared to a #9 ranking with 14.9% last quarter. For M&A completed, they were ranked #8 with a 15.4% share.
  - Lehman gained \$56m from their hedge fund investments (DE Shaw, Marble Bar, Spinnaker, etc.) compared to gains of \$21m last quarter.
  - Revenues from Europe and Asia were up 21% over 1Q and accounted for 48% of total revenues. They do expect that number to come down next quarter.
  - Net assets increased \$35bn over last quarter led by increases in real estate (+7), corporate debt (+6), corporate equity (+6), derivatives (+5.7), stock loan (+5.2), mortgages (+5), and customer receivables (+5).
  - LBI excess capital was \$3.4bn in May and net income was \$282m. As previously discussed, LBI paid a dividend to the holding company in May and bought back \$200m of Lehman bonds in its role as market maker.

- Lehman continues to consider expanding LOTC. Equity vol is putting together a business plan to bring their business to LOTC and ascertain what the capital requirements would be. With the completion of the MedImmune acquisition in May, the MedImmune call spread positions are now gone.
- In other regulatory news, the application to open LB Canada has been filed and they expect a ruling in August. OTS will begin its annual exam in either August or October this year.

## **RISK APPETITE**

- Risk Appetite usage increased to \$2.938bn, up from \$2.725bn last month. RA peaked at \$3.2bn during the month versus the \$3.3bn limit. The large increase was driven by increases in VaR, and specifically the equity delta. [See market risk section for more details.]

## **CREDIT RISK (Steve Simonte, Patrick McGarry)**

### Commitments (Patrick McGarry)

- Jeff Goodman discussed the Archstone commitment. The deal was signed on May 31. As discussed last month, the commitment entails \$22.2bn in financing, including \$500m in permanent equity (\$250m of which is from Lehman) and \$4.6n in bridge equity. BofA and Barclay's have been brought in, with others expected to follow. Current deal economics are as follows: Lehman 57%, BofA 27%, and Barclay's 14%. The capital charge for the deal is \$400m, and Jeff will brief us on the details at the quarterly P&L meeting on Thursday. Lehman remains a positive view on the transaction, even the bridge equity portions. Jeff explained that most recent bridge equity has been for office space, and there is demand for multi-family bridge equity such as this deal.
- The pipeline is at an all-time peak of \$40bn for high yield and high grade.
- Patrick highlighted the following deals:
  - Home Depot Supply (\$2.618bn): Lehman advised on the M&A side and offered staple financing in conjunction with the sale. Merrill offered aggressive terms for the financing, and Lehman was offered 1/3 of the economics. Lehman declined for Merrill's terms and they are in negotiations on the terms, heading back towards Lehman's original staple offer.
  - First Data (\$3.62bn): Lehman has economics of \$3.1bn and equity of \$500m on the acquisition financing for KKR's purchase of First Data Corp. The first syndication did not go well. [Talking to Patrick on Monday to clarify.]
    - We spoke generally about bridge equity on LBO deals. Lehman will be very selective in entering these types of deals, and have pushed back in several cases as they are not sure how the market will accept them. Lehman wants to assure that they have an active

role in the syndication. This is in contrast to bridge equity in real estate (i.e., Archstone), where Lehman's desk has the capabilities to market real estate bridges successfully. The investor market is different between LBOs and real estate. The LBO market is more aggressive, while real estate bridge equity allows investors such as pension funds who are otherwise constrained in their investments to get into real estate. Lehman has decided to allow the equity desk to syndicate bridge equity for LBOs.

- Intelsat (\$7.1bn): This deal was for acquisition financing for BC Partners' \$16.5bn bid for Intelsat. Lehman felt the terms were too aggressive, and they are not involved in the transaction.
- Additional deals highlighted in the Firmwide Risk Report:
  - Imperial Tobacco (\$5.63bn): Acquisition financing for Imperial Tobacco's bid for Altadis. Lehman is committing 25% of the debt financing and 10% of the equity bridge, which includes a \$18.8bn bridge and \$9.3bn equity bridge. Lehman will likely have to fund \$1.7bn of the bridge at closing.
  - Project Gospel (\$3.225bn): This is a bid for Northern Rock's entire commercial real estate loan portfolio. Lehman is one of three bidders. The portfolio consists of 1159 fixed and floating rate loans backed by 2000 properties, with a WLTV of 68%, and is diversified by asset type and geography. Exit of the portfolio would be through securitization targeted for the end of 2007.

### BSAM

- Steve discussed Lehman's position with BSAM's two funds. Total repo exposure was about \$650 million between the Enhanced and High Grade funds. \$55m came in on Wednesday, June 20, while the margin call was out for \$90m. The Enhanced fund was flat while the High Grade fund was \$30m overcollateralized. Steve projected that if the fund blew out Lehman would be out \$30-40m with Enhanced and flat with High Grade. Outstanding margin calls were \$26m for Enhanced and \$5m for High Grade. They do not have the ability to net across the two funds, but are able to move excess from the swap side to the repo side. Lehman had sold some positions, and would take the bid if it is higher than the financing level.
- Jeff said that there had been limited impact in the market from the BSAM problems. The ABX was trading on fundamentals on older production, while current vintages are doing well. Spreads on the ABX are down to 400 from 900. Jeff took two lessons from the BSAM incident:
  - More complicated structures are susceptible to liquidity premiums, and firms need to look carefully at the marks. [Lori, what was the story with the short AAA floaters??]
  - Jeff sees a continued tiering of the market. Certain NIMs have been hurt and are trading at 15¢ on the dollar. The problems are specific to

originator, structure (i.e., how much cash flows to the residual?) and vintage. The market is softer but things are trading.

- [As an aside, Jeff confirmed that prepays have been slowing. He said this is good for residuals, but only if it does not mean that defaults are increasing. As to the effect of slowing prepayments on BBBs, the impact is deal specific. The stepdown could either be released to the residual or it could be used to pay down the BBBs.]
- We had a follow-up call with Madelyn and John Wickham (head of CMPS business) to discuss the developments on Monday, 6/25:
  - Basically, the story was the same – they were financing roughly \$650 million of collateral through repos, with the majority of that being different tranches (AAA and AA) of very bespoke CDO-squareds of subprimes (read: illiquid). BSAM was also long protection through CDS with Lehman. One of the first things that Lehman did in working bilaterally with BSAM was to put in place cross-netting agreements, so it sounds like those were not in place before the trouble began.
  - John described the creditors’ calls last week as being “long on conversation, short on specifics,” and said that there was no transparency as to their positions, and the lenders all had different motivations.
  - On Friday, Lehman went ahead and put out the bid list on their collateral. They apparently had the last piece of BSAM’s CDO-squared portfolio (we took this to mean that the rest of this stuff was already out in the market on bid lists), and BSAM realized that the prices Lehman was going to get would be well below the current marks. BSAM came back to Lehman, and Lehman agreed to buy the collateral from BSAM for a payment of \$15 million from BSAM (which covered the positions from both funds). John said that putting out a bid list is more than a negotiating ploy, but it does strengthen their hand – effectively, when one puts out a bid list, under the procedures outlined in the documentation, the bids that result will lead to a legally binding mark. If the counterparty (BSAM in this case) knows that they won’t like that mark, they are much more motivated to close out bilaterally.
  - Incidentally, John commented that Bear’s rescue package was “a day late and a dollar short.” He also thought that haircuts are on their way up (i.e. more conservative).

#### Counterparty Credit Risk (Steve Simonte)

- CE declined from \$33.8bn last month to \$32.1bn, driven by declines in stock loan/borrow of \$2.7bn as a result of the end of the dividend season in Europe. Lehman is now reporting aggregate MPE numbers as well (which need to be read for trends, not absolute numbers, given that aggregating MPE does not really make sense). Steve pointed out that while BB-rated counterparties account for 1% of the CE, they account for 3% of the MPE, given that they have call period risk for margin.



- There were few new names on top counterparties exposures:
  - Bright Oak has a CCE of \$344m from secured borrowing. This is an agent lender in Europe for which they do not have visibility to the underlying borrowers.
  - BH Finance showed up on the list with an MPE of \$1.3bn from Lehman's purchase of long-dated vol from them.
  - Bankgko Sentral Ng Pilipinas has CE of \$25m from secured borrowing.
  - Guam Power has CE of \$11m from muni derivatives.
  - Prosieben Sat has MPE of \$154m (no CE) from a swap associated with their LBO.
  - Sailfish has MPE of \$63m due to fixed income financing.
  - Hedge funds on the list includes: London Diversified Fun (\$57m MPE) from financing; Goldman's Alpha Fund has MPE of \$52m due to interest rate exposure; Moore Macro Fund (\$37m MPE) from EM/CDS; and DE Shaw (\$31m MPE) from equity derivatives.
  - Florida Power and Light has MPE of \$60.7m due to gas hedging (hedging their input cost).

#### CDPCs (Julia Nand)

- Lehman currently transacts with two CPDOs, Primus and Athilon. Primus was founded in 2002 and sells protection on single names. Lehman engages in a large number of transactions with them but it does not generate much PE (MPE is currently \$5.7m). Athilon was started in January 2005 and sells protection on super senior ABS tranches. (MPE?) There are 20 companies in the pipeline to be rated, and Lehman may do business with a few once they receive ratings.
- The model is driven by the AAA ratings assigned to the CDPCs. Ratings agencies calculate over 5 years whether expected losses will be less than premiums. The CDPOs then leverage up, with Primus at 26x leverage and Athilon at 50x. Lehman is not overly comfortable with the ratings "black box" but takes more comfort in the single name model.
- A new model is being developed which will sell protection on BBB- single name corporates as well as single name ABS. The CDPC is linking up with a mortgage insurance company to provide the analytics and they will leverage to 10-15x.
- Internally, Lehman rates Primus as a AA. Julia cited their highly diversified book and counterparties as main drivers of the high internal rating. She said there is precedent for Primus fulfilling their obligations by paying out some money, which gave them comfort. Because CPDOs do not margin their trades, they are not affected by market moves and thus their liquidity situation is improved.

## MARKET RISK

### VaR Update

- VaR ended the month at \$81.9 million, down from the prior month (\$83.4 million). FID was relatively unchanged at \$43.9 million, while Equities was up slightly at \$32 million (from \$29 million last month). Interestingly, Paul noted that \$100 million would have been the “real limit,” and then we asked about June’s (the current month) VaR, were told it was even higher and had gone over \$100 million a few times – at the time of the meeting, VaR was at \$97 million (Paul noted that this jump was due to a number of trades, as well as HY credit increasing their credit spread exposure, which came as somewhat of a surprise). Equities was over its \$35 million limit a few times during the month, one of the contributors to a number of firmwide VaR limit excursions.
  - We again discussed the VaR with Paul – there seems to be a great reluctance to increase the limit, because of what that signals, while there seems to be much less reluctance to constrain the actual VaR usage. Paul noted that VaR is a binding constraint as Lehman is concerned with showing high MTM revenue volatility. While we certainly understand the reasons for not wanting to raise a limit, it raises some questions when the businesses are running over their limits constantly in real-time, while in the abstract senior management does “not want to signal an increased appetite for risk taking,” despite the fact that Lehman has undeniably been showing such an increased appetite over the last few months.
  - Paul noted there will be mid-year reviews about the appropriate level for RA (usage is currently a \$3.2 billion, close to the limit). He also stated that the firm was over its limit because of correlation – while the individual business are within their limits (mostly), the lack of a significant long rate exposure has removed a typical source of diversification. Correlations are running in the high from 26, 27%, and can swing by 6-7% in a day which can equate to roughly \$10 million at the firmwide level.
- Investment Management ended the month at \$12 million, up slightly from last month. Chris Van Hollen is working to align regulatory VaR with internal/externally reported VaR. Currently, Lehman’s seed positions in hedge funds are pushing the VaR up.
- FID
  - Credit spread exposure grew – Paul referenced the 10% widening number (a metric also discussed for GTS – not something we see but should ask to be incorporated going forward). At the end of April, FID would lose \$263 million in a 10% widening, and that number increased to 10% by the end of May.
  - While the rate volatility positions were reduced throughout June, they were not down by the end of May. Swaption vega rose in May, ending the month at \$75 million/vol point (up from \$60 million at the end of April). Cap vol had less of an increase (to \$30 million from \$28 million). Implied

vols ended the month at all-time lows (even lower than pre-98 widening). Paul noted that throughout June, implied vols had been spiking as Treasury yields rose, and the business had unloaded half of their position by the time of the meeting. This long vega position has been bleeding P&L through time decay for some time, and was taking outright losses with the continual decline in implied vols. They were able to get some relief in June, but did not make a significant profit. Paul also noted that the more short-dated vol is out of the money when rates climb, and the desk ends up less long gamma, but still long vega, and the vol surface flattens.

- While Commodities was fairly flat month-on-month (\$6.4 million), the desk did execute one sizable hedge for TXU, about 10K contracts of NYMEX nat gas for 2013. The one-day VaR on this trade was \$13 million, and it was initially thought that it would take a month to fully hedge the market risk, but it ended up taking much less time. We discussed the structure, and Satien (?), the new head of energy, is jointly reporting into Kashiuk and Chuck Watson, the head of Eagle. Paul noted that the business is still digesting the Eagle acquisition, and 4 Lehman traders/marketers have been fired.

- Equities

- Note: The June 4 risk snapshot highlights a \$2.7 million non-recourse loan on Alliance shares – may be part of a yield enhancement strategy. F/U next month.
- Equities ended the month with \$4.2 billion in delta, and GTS had a delta of \$3.7 billion.
- The desk did 8 block trades, with the biggest being Owen Semiconductor (\$500 million). The cash desk did a large block of Citi (\$1 billion) that they happened to be holding when ESL announced its purchase of a significant amount of Citi stock, leading to an \$18 million profit. Owens Corning (different from Owen Semi) made around \$12 million, there is still \$157 of Seagate left.
- The event driven desk currently has on about \$200 million of ABN-Amro in a prop play.
- Ben Fuchs is leaving his role as head of Asia equities to start another, Asia-based internal hedge fund (apparently taking 50-60 traders with him).

### Top Level report for GTS

- After the confusion surrounding the recent GTS delta numbers, Paul walked us through a top-level GTS report. The first page looked at market value by product. The next page listed the top 10 positions, MTM, and a brief comment on what type of strategy drove the position (majority were M&A, which is the biggest book in the business and consequently the biggest P&L driver, with a HY play (\$400 million of GMAC), a private equity position, and a distressed recovery position (Imperial Sugar). Paul noted that GTS tends to be bullish on the energy sector. They also tend

to take India-related positions. We've asked to get this snapshot going forward. Paul seemed to talk about the business in terms of P&L associated with a 10% widening, which for this business is \$48 million (loss). The top 5 names, for a 20% widening, only have \$2.3 million of the aggregate loss, implying that the positions are not that concentrated. This 10% widening metric isn't in the report – we may ask to include that as well if that's how they tend to gauge risk in this business.

- Paul mentioned that they will work on putting together a similar snapshot for GPS, Rick Reider's prop group. GPS trades in capital arbitrage, aviation financing, distressed debt, and correlation trading in Europe. They are currently long 1 million/bp in credit spreads, and have a curve play on (long the 3 and 7 year versus short the 10 year). GPS tends to be long the high beta, wider names and short the low beta, tighter names. At a sector view, they are long home construction and technology, and short banks and casinos. Interestingly, the predominate VaR driver is long equity risk.

### Stress Tests

- The biggest loss is again coming from Equity Crash, at \$2.3 billion (down from \$2.6 billion last month). The second largest is Black Monday, at \$1.6 billion (down from \$1.9 billion last month). Again, much of the losses are concentrated in GTS.

### Backtesting

- IR Products had a \$25 million loss on May 23 resulting from a decline in implied vol. Much of this loss came from long vega positions in the vanilla options books, and the exotic options also suffered some small losses.
- Securitized Products had a \$71 million loss at the beginning of May, resulting from the performance data that came out of the end of April (the 25<sup>th</sup>). This was primarily on 2<sup>nd</sup> liens (loans, residuals, etc).
- High Yield had a \$17.6 million loss on May 11, in part from being short \$5 million on an index arb play (the basis between the index and its underliers tightened).
- Equity cash products had an exception on the last day of the month, with a \$9 million loss coming out of Europe.

### **FOR THE MEMO**

- Lehman has increasing exposure to bridge equity for both leveraged buyout ("LBO") and real estate deals. Syndication of a recent LBO bridge equity did not go well, and Lehman is being selective in entering new deals with a LBO bridge equity component. Real estate bridge equity commitments, on the other hand, have more than doubled between May and June. Risk management expressed comfort in this ramp up as they feel their business has the capability to market this paper successfully. We will continue to monitor their syndication of bridge equity commitments across all asset classes.
- Lehman had exposure to both BSAM's Enhanced and High Grade funds collateralized by illiquid AAA and AA bespoke tranches of CDO-squareds.

As of the date of the monthly meeting, outstanding margin calls were \$26m for Enhanced and \$5m for High Grade. The day after the meeting, Lehman put the collateral out for bid, and upon receiving low bids, BSAM came back to Lehman, and Lehman agreed to buy the collateral from BSAM for a payment of \$15 million from BSAM (which covered the positions from both funds).

### **MONTHLY RESULTS (ED GRIEB)**

- June was another strong month, with net revenues of \$1.978 billion. Capital markets are running at 20% over budget – FID made \$874 million, while equities was slightly lower this month at \$452 million. IB saw strong origination and M&A activity, while IM saw AUM up by \$5.9 billion, and picked up \$27 million in DE Shaw fees, versus \$39 million for all of Q1. It is worth noting that these fees could be volatile, as DE Shaw (and therefore Lehman) accrue incentive fees monthly.
- Securitized products earned revenue in part through short ABX positions, and while securitization volumes remained low margins began to tick up. Originations were in line with average month 2007 levels. Credit products were down slightly, as was real estate (timing issues). The sales credits within equities were on par with recent months, although as mentioned above revenues were down, in part because the desk made less money trading around customer flow.
- Within equity origination, the Blackstone IPO and Hertz secondary offering contributed to a good month. Debt origination was down 35% versus average month, seeing a big drop-off in leveraged finance. (Lehman ate through all fees on the Dollar General deal, but lost less than \$1 million. At the time of the meeting, they were holding around \$100 million of the junior subordinated piece, which contained a PIK-toggle. Subsequent to the meeting, they have sold down the position to \$20 million). The pipeline remains strong at \$1.6 billion (with 1/3 of that being leveraged finance and therefore somewhat uncertain).
- LBIE received excess capital for the yield-enhancement business.
- LBSF was a big winner this month, as it was short swaps against long agencies in LBI (which is the market maker for Lehman debt). Ed also noted that Lehman had earned \$100 million in revenue from Lehman's own spreads widening – not sure if that accrued within LBI. Lehman is looking at doing an inter-company swap which would be funded with 100\$ cash capital, and margined daily (like with LOTC).
- The OTS is kicking off its exam on August 6, and appears to be focusing on more than last year (including prop trading and private equity). Also, E & Y wants to speak with us (Matt had little appetite for this), and it seems that a decision has finally been made with respect to Neuberger's broker-dealer – Lehman is going to withdraw the BD license and move positions into the LB BD. Neuberger will become (continue as?) a registered investment adviser. Apparently, withdrawing a BD license is a very lengthy process, involving the SEC and NYSE.

### **RISK APPETITE**

- Risk Appetite usage increased to \$3.062 billion, up from \$2.938bn last month. Usage peaked at \$3.17 billion, with a low of \$2.8 billion. In the July 16 risk snapshot, risk management notes that if they have to fund a number of LBOS, RA could increase by up to \$320 million on an incremental basis, which would bring its to the \$3.3bn limit.

**UPDATE ON AURORA/BNC MERGER (LAURA VECCHIO, LANA FRANKS, TOM WIND, PAUL SVEEN)**

- Aurora and BNC are being consolidated under Tom Wind, who is CEO of Americas Residential Lending (and reports to Ted Genulis, who is head of MCD, which also includes Europe, Asia, Campus Door, etc). The entities will likely be called Lehman Mortgage Capital, but that is still under discussion.
- Integration is expected to take 1 to 1.5 years, with Quality Control and other controls already being merged. In terms of merging the two cultures, Tom Wind hopes to take a “best practices” approach and pick the best features from each entity, and develop one-culture (which I understood to be more Aurora-like than BNC).
- See org chart for specifics, but basically Steve Skolnik (former CEO of BNC) will be responsible for wholesale lending (BNC was 95% wholesale), Jeff Schaefer will head correspondent lending (he was the head of sales for Aurora, which is a mix of retail, wholesale, and servicing), Jeff McGuinness will head Direct Lending (he is an Aurora person and will be in St. Louis where there is a call center – different from Scotts Bluff). Terry Gentry (Aurora, we met him) will be loan administration, Craig Wildrick (Aurora) will head Ops, Catherine Eckert (new to Lehman, worked with Tom Wind previously) will head business development and risk management (i.e. credit policies), and Paul Sveen will be CAO (we met him at Aurora, former Lehman NYC). Employees will report both to their function head and to a senior, on-site person (such as Steve Skolnik in Irvine).
- BNC is shifting from the branch model to a more centralized model where 30 branches will become 5 regional operating centers (ROC). These include Atlanta, Philadelphia, Chicago, and CA (Concord and Irvine).
- Catherine Eckert will be looking at the underlying credit policies to ensure consistency, and will be responsible for the management of third party relationships and approval of these across both entities. She is also responsible for fraud management. Cheryl will still run QC and Jim Park will head appraisals/collateral valuation. Dimitrius will still be responsible for independent risk management and report to Jeff Goodman.
- Lana Franks is moving from her trading role as head of non-prime mortgages to become the CAO of MCD (I think working directly for Ted Genulis). Eric Hibbert, who is the CCO of the bank and was our liason during our on-site MCD discussions at Lehman earlier this year, will now report to Rich Kinney, who will head both prime and non-prime mortgage trading, instead of to Lana. Eric’s role is mostly limited to policy (he is the CCO of LB Bank), while Catherine will focus more on the implementation of that policy.
- Internal Audit: Beth had wanted central oversight and direction prior to the merger, and feels that this move has hastened that process. She has big expectations around

seeing processes become consistent. Also, with the BNC movement towards ROCS it will be easier to be confident about the consistency of management. Both Ed and Kevin will have functional roles, as opposed to just geographic ones.

#### **CREDIT RISK (VINCE DIMASSIMO, STEVE SIMONTE)**

- Vince briefed us for the first time in his new role as Global Head of Credit. Since he has only been at Lehman for less than a month, he was not completely up to speed about the status of each of the commitments, but he spoke generally about the markets. As we've heard at other places, a lot of the pipeline is slated to hit the market in the fall, including two potentially troubled deals TXU and First Data. New deals are getting tighter with pricing and flex, thus the trouble is with deals Lehman has already committed to that are coming up. (Vince will be reworking the pipeline reporting package, to separate out real estate deals at a minimum.)
- Specific deals discussed and/or highlighted on the Firm-wide Risk report include:
  - Home Depot - \$7.5bn conditional deal (Lehman is committing to \$5bn)
  - Imperial Tobacco (\$5.611bn) is now mandated
  - Houghton Mifflin Riverdeep (\$874m in the package) was announced
  - Dollar General - \$108m remains of PIK toggle debt
  - Thompson – hold level is down to \$100m
  - Sisal (\$198m commitment) is an Italian gaming company. The deal has been pulled from the market and Lehman has funded it, so it looks like a bridge commitment.
  - Applebee's is a \$2.15bn acquisition financing for IHOP's purchase of Applebee's. Lehman is providing financing as a bridge to a whole business securitization where the assets being securitized are franchise receivables (the Dunkin Donuts model). The AAA tranches are being monoline wrapped.
  - Global Santa Fe is a \$5bn bridge financing commitment to fund a dividend distribution in connection of a merger. Lehman is also M&A advisor to Global Sante Fe. They do not expect to fund as they will syndicate the commitment or execute permanent financing prior to close. Financing terms are still being negotiated but will likely include flex, financial covenants and a business MAC.
  - Lehman has a \$1.9bn commitment to Blackstone as part of the Hilton acquisition. Loan is 3 year maturity with 3 one year extensions at a rate of L+185, with 60bps of flex and 1% upfront fee. Up to \$2bn of the most subordinate portion of the loan may PIK interest if insufficient cashflow.
- KwikSave was a \$162m senior loan and \$13m joint venture equity financing completed in November 2006 to finance the sale of KwikSave from the



- Specific hedge fund names in the news include:
  - Lehman has approx. \$150m of loan amount vs \$240m of market value on reverse repo with United Capital. That is, they have \$90m or 40% of buffer and the positions are marked where Lehman would be happy to own the assets. Assets are mostly MTA residués (option ARMs) and a smaller amount of Alt-A and Alt-B bonds. The MTAs are prime borrowers, not sub-prime, and they have performed well. He has met all margin calls to date and is not in default. Lehman always considered these funds very risky so they gave them no leeway (they “hate him”).
  - Basis Capital missed a margin call on July 12 and a default notice was sent quickly. In the Basis Yield Alpha Fund, they were lending \$138m against collateral of \$216m, \$31m against \$77m of ABS CDOs and CLOs, and \$106m against \$139m of various EM sovereign and corporate bonds. In the Pac-Rim Opportunity Fund, they were lending \$133m against collateral of \$224m, \$80m against \$124m of CDOs and CLOs, and \$53m against \$100m of EM sovereign and corporate bonds. All loans are overnight and they have a cross-netting agreement across agreements in the Funds. As of the date of our meeting, the risk has been eliminated and they were selling down the portfolio. The EM bonds had all been sold off as well as some of the CLOs. They had paid off all debits and still had some collateral.
- The Eagle energy acquisition closed June 26<sup>th</sup>, which brought 224 active clients with \$317m in CE and \$848m in PE, mostly in short dated gas trades. Eagle had one credit analyst who managed the cash risk, and Credit is thinking about putting someone in Houston. Lehman is looking to re-negotiate terms with the existing clients now that the clients are facing off to a higher-rated counterparty (Lehman versus Eagle).
- CE was up from \$32bn to \$34.2bn mainly due to FID/CDS exposure to broker dealers. Noteworthy names on the top exposures lists include:
  - Freebird Energy Marketing (CE and PE \$50.9m) was Eagle’s largest client. Exposure is from Lehman’s purchase of natgas storage (i.e., Lehman’s gas is in their facilities).
  - TXU (CE \$10.4m, PE \$565m) exposure is coming from hedge of 9,855 NYMEX natgas contracts through 2013. Credit views this as right-way risk.

## MARKET RISK (JEFF GOODMAN)

### VaR Update

- Firmwide VaR ended the month at \$90.9 million, up from \$81.9 million last month (and over the limit of \$85 million). FID was the main driver of the increase, going from \$43.9 to \$56.5 million. Big drivers in FID were FX, which got shorter the USD and long the majors, and is slightly less long EM (VaR up by \$5 million) and Credit, which saw its VaR increase by \$7.8 million, driven by HY (commitments and positions) as both positions increased and volatility picked up in the time series. Equities actually fell, from \$32 to \$22.4 million (despite an intra-month high of \$4 billion, delta was down by the end of the month to \$2.8 billion – versus \$4.2 billion last month). Both FID and Equities were below their global limits, but a drop in diversification benefit led to the firmwide overage. IM was at \$15.4 million, over its limit of \$12 million. This was due to warehousing of deals for MLP (I believe the Lehman MLP fund) and CDOS.
- Jeff and Mark Weber walked us through some detail on the VaR calculation, in order to understand the changes. While equities tend to move their positions around fairly regularly and quickly, other positions at the firm (especially in FID) tend to be more structural. Hence, it seems that sometimes time series volatility can move the VaR around significantly, irrespective of changes to positions. Also, there is no fixed diversification benefit, and therefore big changes in diversification in the data can move around the VaR, and the data tends to have significant volatility. Jeff showed us a 12 year graph of the correlation between S&P 500 and UST10 bond yields, and the correlation was all over the place, taking up much of the room between -1 and 1 (i.e. the swings weren't just over a small band). Jeff told us that because of this volatility, VaR is just one measure that Lehman uses, and is more of a speed bump/warning sign that a true, hard limit – that role falls to RA. That said, VaR is about ½ of RA, so the market risk component of RA is a key driver. In addition, the exponential weighting of the VaR amplifies this affect. Jeff mentioned that they are struggling with the weighting issues in mortgages (seasoned versus new issues). We again touched on the VaR limits, and Jeff said that there was a conscious decision to set the VaR limit below what it “should” be under RA, which is \$100 million. He said that Madelyn, Dave, and the executive committee tend to look more at RA. As an aside, Madelyn came in after Jeff's explanation and gave virtually the same speech.
- We saw Eagle's positions included for the first time in the Energy VaR packet – marginal contribution was \$1.5 million, and standalone Eagle VaR was \$3.3 million. Ram is transitioning out of his role as head of energy risk management, and Lehman is looking for someone to replace him. Also, the report had a new page with VaR limit utilization that seemed to break down limits by the greeks – maybe this is from Eagle?

### GPS and GTS

- We again received the risk reports for GTS, and we also began receiving the reports for GPS. GTS is relatively straightforward, but we should get walked through GPS at some point (esp the event risk calculations – I think this is the first time we've seen event risk contributions mapped out at such a granular level).

#### From Firm-wide Risk Snapshots

- We discussed the \$2.7 billion non-recourse margin loan on Allianz shares – it's being done through an equity swap, with 25% margin and a 1.5% minimum threshold for variation margin. The loan is 50 bp over Libor, and Lehman is also making an additional 23 bps for yield enhancement. The most recent large move downwards in the stock is 26% over a 5 day period in 2002. Ostensibly, this position would not generate any credit exposure. Madelyn said there was a lot of sensitivity around this position – I'm not sure we know who was on the other side.
- The Applebees deal which was discussed in the credit risk section has an associated deal-contingent rate swap. I am almost certain that Paul said, during our 6/28 discussion on capital for leveraged loans, that Lehman does not do deal-contingent hedges but this appears to be most definitely NOT the case.
- Linn Energy – Lehman provided a hedge for Linn's acquisition of some natural gas and oil products. The hedges (swaps and puts on nat gas and oil) are deal contingent (expected deal closing in October 2007), with a MTM risk of \$275 million. If the deal falls apart, Lehman will be short nat gas in October-November, which is the peak of the hurricane season. This adds another \$25 million of risk. Banking puts deal probability above 95%. Standalone VaR on this deal is \$7 million, and on an incremental basis this trade increased commodities VaR by 20%, to \$12 million.
- Subprime market: The rating agency downgrades led to a substitution of 5% of the collateral in the Ballyrock synthetic mezz ABS CDO – the new collateral had wider spreads which led to improved equity returns. Losses incurred on selling that 5% will be split with Fidelity. LB has retained \$85 million of this \$500 million deal, which includes \$17 million of equity and \$18.25 million of Baa2. They have taken a reserve on these, and may get some of that money back. Jeff said that the downgrades were not a particularly big even for market participants, who had seen this coming.

#### Stress Tests

- Jeff pointed out Bear Steepening, Rating/Default and HF Risk, HY/LBO Default, and equity crash as all being up from the prior month, but not by huge amounts. He also noted that the IR business is always a net positive contributor, which provides some sort of macro hedge in a bad scenario. Rates actually cut their vega positions when they had a chance after a vol spike. However, increased positions in the credit business caused an increase in losses (as an fyi, they clarified that they use % moves

rather than absolute spread level shocks). Jeff mentioned that they increased the stresses in mortgages (US and Europe) to make them more onerous - \$150 to \$200 million of losses were coming from this shock. It appears that in the mortgage space they have an absolute rather than % shock.

- Madelyn mentioned that the desk had asked that (with respect to the event risk calculation) risk management change the correlation between Ford and Ford Motor Credit. The event risk/JTD charge assumes perfect correlation, while the desk said that this was not the case and the names traded at a 40-50% correlation. Apparently Ford has the legal right to grab money from FMCC but incentives not to (it can't draw down its bank revolver if it takes money from FMCC, and the desk says that this is sufficient disincentive). Madelyn agreed to move the correlation down to 75% - she mentioned something about spread basis and implied correlations, but I can't help getting the feeling that 75% is basically splitting the difference between the desk (50%) and risk management (100%). In a subsequent email, Laura Vecchio confirmed that Ford/FMCC is the only pair with its "own" correlation - otherwise, "Generally, the Firm's methodology includes segmenting the population into 15 sectors with names within the same sector correlated at 20% and names in different sectors correlated at 10%. There are not, however, additional manual pairs." Ford and FMCC must have been considered to be the same name, then - otherwise it seems that they would have only received a 20% correlation as they would be names within the same sector.
- Something on my mind: what do you do when you take a write-down in the HY space that is much higher than anything implied by the stress tests? Does this lead to any kind of conversations?

### Backtesting

- LMP had an exception at the end of the month on the back of a large rally in Treasuries (10 bps, a large move in terms of std deviation).
- Securitized Products had a large gain (\$80 million) at the end of the month - \$130 million gain from CDS offset by \$50 million loss on ABX, and \$25 million in fees on securitizations. I know that some of those CDS were on CDOs, something we've had questions about (particularly from a marking perspective)
- High Yield had an excession due to moves associated with an index versus single name trade on the Russell 2000. The VaR model underestimates this risk, and market risk is rolling out an CDX enhancement to VaR in August.
- Munis - muni/treasury basis
- GTS - \$25 million loss on the back of LBO distress (First Data, Clear Channel)
- Equities cash strategies had two excession days, driven by drops in both HP and Dell
- Equities portfolio had an excession when RIM moved up by 21% - the desk was short calls going into an earnings announcement. Also quant strategies lost money as several stocks had small moves.

### **FOR THE MEMO**

- Lehman's acquisition of Eagle Energy closed on June 26, bringing 224 active clients with \$317 million of current credit exposure and \$848 million of potential credit exposure from short dated gas trades. Commodities VaR (95%, 1 day) also increased from \$6.5 million to \$8.4 million. We will continue to monitor both credit and market exposures in commodities as well as the risk management resources devoted to this area.
- Lehman continues to have significant exposure to leveraged loans. While deals are currently getting tighter with pricing and flex, the question remains about what will happen to deals that have already been committed but not yet syndicated. TXU (\$5.3 billion Lehman commitment) and First Data (\$3.4 billion Lehman commitment) are both scheduled for syndication in the fall. We will follow the developments in this area closely.
- Firmwide VaR ended the month at \$90.9 million (95%, 1 day), over the \$85 million limit. Both Fixed Income and Equity VaRs were below their respective limits, and the increase in firmwide VaR was due to large moves in the diversification effect. However, Risk Appetite, a more holistic measure of risk, has not breached its limit yet. Senior management at Lehman is aware that VaR is over the limit, and continues to monitor multiple measures of risk.

### MONTHLY RESULTS (ED GRIEB)

- July monthly revenues were slightly below the 07 avg, at \$1.6 billion, and Ed said that August was anyone's guess. That said, he still expected the quarter to be in the \$4.5 to \$5 billion range.
- July was reasonably strong – while FID was down, customer flow in equities was very strong.
  - FID: credit markets were down 70% (HY and CDOs) while LMP was strong. Securitized products earned \$81 million on the back of ABX positions. Securitization volumes were light at \$12 billion during the month. \$3.9 billion was originated (versus \$5 billion average month). RE revenues were up from a few asset sales and CMBS. In addition to the \$500 million write-down on acquisition facilities that we discussed before, there was a \$500 million gain on Lehman structured notes as their own spreads widened. Apparently this stuff, a BS liability, is fair valued under FAS 157. The gains will all have to be reversed out when the notes pay off. Income from this flows into the “principal transactions lines.” Into August, this had already generated a \$60 million MTM gain.
  - Banking: reasonably good, with Blackstone and Hilton leading the way. Equity origination was strong (Man Financial) while debt origination was off.
  - IM: AUM increased to \$270 billion in August, but Ed expects that number to be down slightly in August. PIM posted strong revenues. In addition, Ed expects a MTM loss on the DE Shaw incentive fees as they were hurt along with the other quant funds. They did not yet have a sense of the magnitude of that loss.
  - GPS was struggling over the last month, with \$100 million in losses in July and \$150 million so far in August.
- LBI (Tony Stucchio): SPG within the B-D took \$400 million in losses, which was offset by gains in LBSF (which is actually a sub of LBI). This led to what looks like negative net revenues of \$212 million, although there is also \$111 in equity in subs which I believe is the LBSF contribution. We discussed how this might affect the NYRO's exam of subprime securities in the B-D.
- LHI: capital is down \$300 million (?reflects a \$130 million intercompany receivable from LBIE).
- Regulatory issues: OTS began their 2007 exam, and bestowed upon Lehman the title of Complex International Organization (CIO). This means that rather than coordinate the audits regionally, they will now run through DC, with an increased staff focus on the holding company (their contact is Joe Donohue). They were asking lots of questions around private equity, where Lehman wanted to push back due to our work in this space. Also, OTS mentioned putting someone onsite 24/7, which also didn't go over that well. NYRO started its exam on Monday, focusing on documentation,

[collateral management, etc. They expected to be there for around 3-4 weeks. The IDA approved LB Canada, which should be up and running in late August, and Lehman was talking later in the day of the meeting with the GAO about their subprime investigation.](#)

## **CREDIT RISK (VINCE DIMASSIMO, STEVE SIMONTE)**

### **Counterparty Credit Exposure**

- Lehman does not have material credit exposure to the mortgage originators that have been facing liquidity problems. They do have some derivatives activity with Countrywide (**CE? PE?**). As of 7/31, Thornburg had \$37m in CE and \$58m in PE. Thornburg is reducing its portfolio, and has sold \$10bn of securities of \$30bn in assets. Whole loans cannot be disposed of quickly. Lehman provided \$500m of repo financing on AAA-rated collateral. Thornburg also has a large swap portfolio, which had been unwound as of the date of our meeting. Lehman had posted \$44m in collateral, with a MTM of \$31 million, so currently Thornburg owes Lehman \$12m resulting from the overcollateralization. They have an ad-hoc agreement in place where any excession on the swap can be used to cover the repo exposure if needed.
- Another name in the news is Sentinel, a leveraged cash fund who has suspended redemptions. They had repo-ed illiquid high grade corporate bonds while allowing daily redemptions (the classic problem). They have outstanding margin calls to Lehman in the amount of \$19 million. Lehman's exposure was basically flat when taking into account the haircuts (which ranged between 5 and 20%).
- Lehman has seen an increase in margin disputes, coming from two sources. First, there has been back and forth on valuations of illiquid products, especially from counterparties in distress. Lehman stands ready to defend the book, in litigation most likely, by clearly documenting their marks. They do use the same marks internally as they use for their counterparties. Steve mentioned that Basis in particular has been very hostile. As an aside, Steve mentioned that they have been succesful in getting counterparties with margin calls to work with them to sell down their positions. In working with Lehman to liquidate the positions, the counterparties get the force of the Lehman sales force behind the sale. Second, there have been large disputes with other dealers resulting from operational issues stemming from reconciliation breaks. This is not necessarily a new problem, but exacerbated by recent increases in volumes.
- CE and PE both increased significantly over the month. CE rose from \$34.2bn to \$37.1bn, and PE rose from \$110bn to \$118.9bn. The increases were caused by recent increases in market volatility as well as some new activity in the NIG space. This is seen clearly by the Berkshire Hathaway (BH) exposure to long-dated vol which saw PE rise to \$1.8bn from \$1.3bn and CE double from \$536m to \$1.02bn due to both market levels as well as some new business. BH sells ATM puts, and Lehman hedges the credit risk mtm as it can, but BH is not a particularly liquid name in the CDS space. (**bought equity tranches on ABS?** – I think that they made some remark about this being like equity tranches of a synthetic CDO – selling protection here?)

- IHOP is a new name on the top NIG list, with a CE of \$35m and PE of \$146m. The exposure comes from a 5-year deal-contingent interest rate swap in conjunction with IHOP's acquisition of Applebee's. Linn Energy has PE of \$497m (no CE). They have hedged their production from gas and oil wells to lock in cash flows.
- GSAM's Global Alpha fund has CE of \$38m and MPE of \$56m (PLC) and \$44m MPE (LP). Lehman has comfort in the fact that they are invested in liquid assets and would thus be able to unwind if needed. Steve commented that one of Lehman's largest clients recently unwound several billion dollars in 1-2 days (think it was Tyhke), so pockets of liquidity still exists.

### **Leveraged Finance**

- Lehman continues to go back to sellers to rework deals in hopes of getting the terms acceptable to investors. The dialogue involves all aspects of the deals – pricing, covenants, and structure. A significant example is that all the banks involved with Home Depot Supply (\$3.317bn) are working on a complete restructuring.
- Joe Li gave us some market color. There has been more volatility in index markets, with the HY index down 4.2% and HG 24bp wider. CDX and iTraxx have widened 70-100% due to technicals as the index is being used as a macro hedge. In general, single names are not moving as much as the indices, although the monoline spreads have widened significantly. Liquidity on single names has dried up, especially in certain tranches such as equity, which has underperformed in August. Joe also noted that EM had outperformed in July, with good liquidity in the high beta names (e.g. Turkey) than in corporates.
- Joe also spoke about the muni market. Lehman is long munis hedged with treasury, thus they are a net seller of protection. The corporate spread widening has spread to the muni market. For AAA-rated CDS, sellers of protection had been getting 3-5bp and are now at 9-10bp. They have seen a flight to quality impacting treasury spreads and thus hitting them on the basis risk. The desk has an ABX position as a macro hedge.
- Vince gave us a new reporting package that breaks out deals by IG/NIG and Mandated versus Funded. The pipeline of commitments for leveraged debt currently stands at \$30.873bn, of which \$22.356bn is bank debt, \$7.417bn are bonds, and \$1.1bn are bridge equity commitments. Compare that number to the pipeline at the end of the 2Q which was \$43bn. The bridge equity commitments include First Data (\$250m), Harman (\$350m), and TXU (\$500m). Currently, Lehman has funded \$4.097bn, including \$3.351bn in bank debt and \$746m in bonds. The largest funding was for Allison Transmission (\$1.05bn, **get more detail**). ACTS (\$674m) is expected to close next week and will be funded. The deal consists of first and second lien bank debt, and they have found an investor who has agreed to take down the second lien. USIS (\$816m) is also expected to close soon and will be funded, after being repriced 50bp. Deals continue to be pushed back into late September/mid-October.
- On the high grade debt side, Lehman's commitment stands at \$15.224bn, of which \$360m is bank debt, \$13.903bn are bonds, and \$961m is equity (Imperial Tobacco). Four deals have been funded for a total of \$2,282m, including \$1,833m for IBM



International Group for a stock buyback, with permanent financing expected shortly. The largest commitments include GlobalSantaFe/Transocean (\$5.1bn) in a merger of equals, Imperial Tobacco (\$4.799bn), and Home Depot (\$2.5bn). The Home Depot deal is for share buybacks, and the sale of Home Depot Supply discussed earlier is to support the share buyback.

- The real estate pipeline stands at \$36.899bn, the largest of which is Archstone at \$10.549bn. Contrary to press reports, Lehman is not considering cancelling the deal, and they expect to settle in October. Fannie has been brought in to purchase \$7bn of the senior debt, as Fannie is one of the largest players in the multi-family housing market. They are working on syndicating the bridge equity (\$1.088bn in bridge equity, along with \$250m of permanent equity). Also, there is no longer talk of bringing DE Shaw in. CMBS levels continue to be wide, although some deals are getting done. They did a securitization of the Coeur Defense building. 50% of the senior loans were sold to Goldman. The remaining pieces were securitized (Windermere) and the bottom pieces (BBB and below) were sold, then they pulled the deal from the market (the A through AAA pieces) because of pricing levels, although they noted that the deal was still profitable. Lehman has several projects in the works in Europe, especially Italy and Germany, and almost everything is closed at this point except Archstone and 2 Italian deals.
- We asked about Lehman's use of monolines. Lehman expressed comfort with XL, in spite of the fact that they do not post margin. Their view was that it was better to have protection from a monoline than not to have any protection, and even if XL went away, Lehman would be happy to hold the assets.
- Additional credit items on the firmwide risk includes:
  - Credit exposure to ACA from four trades where Lehman has purchased protection (one on a super senior tranche of an ABS CDO and three on synthetically created AAA tranches backed by the ABX). CE is \$103m but the desk has reserved \$68m of that P&L and MPE is \$160m. This does not take into account \$276m of hedges where Lehman bought protection on other ABS CDOs.
  - United Rentals is a \$6.45bn acquisition financing for Cerberus' bid for the company. Financing package is \$6.45bn, comprised of \$1.5bn revolver, \$1bn ABL (?), \$2.35bn second lien notes, and \$1.65bn senior notes. Lehman was asked to commit to 25% but expects to commit to no more than 15% of the deal (\$968m)
  - Structured Products Hedge Fund Risk: Highland Special Opportunity Master Fund, Lehman exposure \$3.1m repo vs. \$4m MH ABS; Horizon/United Capital, exposure is \$131m repo vs. \$212m collateral, predominately Alt-A resid; Footbridge Limited Trust and OHP Opportunity Fund, exposure is \$124m repo vs. \$148m collateral, mostly subprime home equity loans.
  - Basis Yield Alpha Fund – EM and corporate collateral was sold. Excess funds under PB will be used to repay \$18m in repo loans.
  - They expect \$2.7m of losses from American Home Mortgage. Lehman is partnering with DE Shaw and others to bid for the C-BASS assets.

- Sowood Capital exposure: \$924m of repo against \$1bn of corporate bonds and CDS and \$131m of repo against \$143m of corporate bonds and CDS.

### MORTGAGE UPDATE (RICH MCKINNEY)

- Rich McKinney, head of mortgage trading, updated us on the current state of the market. The main problem is the lack of liquidity for originators. Thornburg was given as an example of a prime/Alt-A originator whose problems resulted from a lack of liquidity, not poor performance of originated loans.
- BNC production is down to \$300m from a peak \$1bn per month. There has also been a decrease in pullthrough (i.e., actually closing a loan that they process) due to both tougher underwriting standards (cracking down on massage parlor receptionists reporting \$4k/month in income) and the fact that brokers are posting loans with multiple lenders before closing, in the hopes that at least one will remain solvent. BNC performance was better than the market in 2007. EPDs were 2.5% in June from a high of 4-5% in the fall/winter. There was a slight uptick in July but Rich isn't sure if that is an isolated event or the beginning of a trend. BNC's cum loss was running 11-13% in 2006, while the ABX implies a much higher rate. Rich said that while figures weren't in yet for 2007 production, cumulative losses for the most recent production were estimated to be around 5%.
- Lehman made a \$1bn subprime purchase from HSBC in May, and was able to sell the residual from a June securitization to a large private equity fund. Lehman did two deals in August, acting as agent in one with the second being Lehman's own deal (the only risk was CP risk to a hedge fund). GSEs can support some parts of the securitization with purchases of AAA (which are currently L+90, with L+mid100s elsewhere).
- Lehman's current balance sheet for subprime and seconds is \$7 - 8bn, including \$2bn in BNC loans – this is down from a peak of \$13-16 billion. The second biggest mtm risk comes from seconds, currently at \$1.3bn balance sheet. These are primarily from Aurora's origination, with \$200m MV of First Franklin second liens. Performing seconds are marked at 90. Nonperforming fall into various buckets and are marked as low as 10. The First Franklin second liens are being marked at 15-30. The second liens are being hedged with the ABX when possible.
- Aurora currently has a \$12bn forward pipeline including closed inventory. They had \$4bn coming off in August, and I think that ¾ of this pipeline has already been sold (?). \$3-4 billion of this is third party origination, with the rest being Aurora. Volumes are generally \$2-2.5bn. Aurora is moving more into the jumbo market than Alt-A. The secondary market is not shut down for jumbos, compared to the primary market, with Thornburg recently selling a \$10bn jumbo securitization in order to meet margin calls. July securitization was north of \$6 billion – alt-A and prime.
- Historically Aurora had been 30-40% correspondent (i.e., purchasing closed loans from correspondent lenders as opposed to wholesale which gets loans from brokers which are then closed in Lehman's name), and that number is now 50%. This exposes Aurora to concentration risk to the largest correspondents – both CP risk and operating revenue exposure. Also, traditionally correspondent loans have performed

worse than wholesale, apparently due to less stringent QC. The largest funders of big correspondents are WaMu, Countrywide, and RFC. First Magnus is Aurora's largest correspondent lender, and Aurora issued them a default notice the day before our meeting under the MAC clause due to production problems (after Tom Wind had gone in person to visit them yesterday). First Magnus had provided Aurora \$500m/month in loans at the peak. Aurora's exposure is \$300m UPB in buybacks (rep & warranty claims, not EPDs) with a gross exposure of \$90m. A couple of mitigants are in place. First, First Magnus was due \$15m in volume incentives which will not be paid. Second, Aurora has a \$10m loan loss reserves in place. Third, the loans which Lehman owns have already been marked down. The second largest correspondent is Aegis, although there are not a lot of claims to them. Part of the reason for the large exposure to First Magnus is that Aurora went through every loan file under a new program to closely scrutinize loan files for delinquent correspondents. The majority of the rep & warranty claims are from incorrect DTI (debt to income) ratios. 12% of the loans are currently performing. Magnus had delegated underwriting, thus Aurora did not re-underwrite the loans.

- During our onsite visit to Aurora, they were working on an automated underwriting system. The system is in place internally and will be rolled out to brokers in September/October.
- Aurora is Fannie's 8<sup>th</sup> largest customer, as 50-60% of their production goes to GSEs as MBS. G-fees (guarantee fees) started around 30bps and are now up to 50bp. For hybrids, g-fees are 40-80bp.
- Other exposures for mortgage trading include \$8-9bn in TRS swaps (referencing AAA-index in subprime) to WamCo and State Street. These true up every week at L+17, with 6-month rolls. Rich noted that State Street wants out now, and was requesting an unwind price. \$3 billion of the TRS is coming off in August, October, and then January, and new buyers are scarce, so some hedging is now moving to the CMBX, which has some correlation with IG corporates. They are short \$650m Countrywide CDS, bought at 150 and are now trading at 700. They are long \$800m in servicing, with a WAC (weighted average coupon) of 6.5% and current coupon of 9%. They are also long agency IOs.
- Rich had a very "doom and gloom" outlook of the markets, given the day of our meeting was the day before the Fed's cutting of the discount window. Countrywide was very much on the bubble, and the thinking at Lehman was that if Countrywide went down, they would not post a rate sheet given that the markets would be extremely turbulent, and Aurora is not big enough to absorb that kind of market share. They would honor their locks on the wholesale side but might not honor them on the correspondent side. Rich also noted that Lehman was one of the 40 banks participating in CW's \$11.5 billion revolver. [Luckily that scenario has gone away for now.]
- Rich and Jeff noted the importance of marking customer flow (e.g. repos) at the same mark as the firm. Basis has apparently been very hostile and threatening in terms of filing lawsuits due to low unwind levels. Lehman has been trying to work with clients in order to find buyers for their assets (e.g. Sentinel, American Home, one of

the Basis funds). Rich said that BarCap had basically forced Thornburg into a firesale. Apparently the mark went from 97 to 87, and Thornburg sold off assets at 97 while BarCap sold product at 94 (neither mark was anywhere near 87). There is a sense that Thornburg will have a strong case against BarCap (and one other dealer apparently defaulted them as well).

## MARKET RISK (JEFF GOODMAN)

### VaR and Risk Appetite

- Risk Appetite usage as of July 2007 was close to the limit at \$3.3 billion, and was in fact over the limit in June. They are in the midst of revisiting that limit, ostensibly to raise it. The increase over the past 9 months is coming from basically every division and region, and resulted from both larger position sizes and increased volatility. Jeff said that until a month ago, the increase was driven by real risk-taking, especially in equities and RE. Now, however, the desks are reducing their positions but the volatility in the markets is moving risk measures. The stress tests are actually showing lower numbers, which show the reduced risk.
  - For this meeting, we used the RA numbers from the 8/14 daily report, but going forward we will use the RA from the Friday prior to the meeting. Jeff pointed out the largest users, such as credit markets (\$1.247 billion) and Real Estate (\$1.236 billion) and noted that in RE, bridge equity gets charged as through it is a long term position through a RE downturn, which is fairly onerous. FID is currently generated \$2.4 billion of RA, while equities is around \$500 million. The other big drivers are IM at \$852 million (seed capital and warehousing for their own funds, which we've also heard have been driving the VaR) and GTS at \$634 million (about 1/3 of this is from the event risk charge associated with deal break risk on merger arb positions).
- Lehman raised the VaR limit to \$125 million on July 25 (Jeff seemed to think that we had been told this, which we hadn't, but it didn't really seem worth contradicting at this point given the progress we are making in terms of staying informed). He said that there is still headroom at this level. The limits for FID and Equities were not changed.
  - Firmwide VaR stood at \$96.7 million as of 8/14, compared with \$90.9 million at the end of July. (We are moving to real-time VaR reporting at the monthlies, so going forward the numbers should be more comparable on a month-over-month basis). Equities VaR was at \$16.8 million, down from last month's \$22.4 million. The equity delta was down to \$1.2 to 1.5 billion, off a high of \$4 billion. FID was at \$65.2 million, up from \$56.5 million. FID VaR had edged up (~\$75 million) around July 20, as the desk got increasingly short rates, and then fell rapidly at the end of July as they flattened out their position (falling to \$40 million by August 2). VaR

then came back up in the first half of August and volatility picked up in spread widening series.

- [Jeff noted that there is a good deal of intra-day trading right now, which obviously doesn't get picked up by VaR. The desks are changing delta positions rapidly and engaged in market marking, sometimes quite profitably – for example, one CMBS trader made \\$1 million in a day just by hitting a wide bid-offer situation in the CMBS market.](#) He also said that the biggest surprise was how far up the credit curve spreads had widened. He also mentioned that at spreads of 75-100 the real money was coming back in, but that BBB and below was still difficult.
- There was a methodology change in securitized products. Small business finance (SBF) had been mapped to home equity, but home equity is not a great benchmark right now due to its volatility, and SBF is not a distressed asset. SBF is now being mapped to CMBS.

### **Market Update**

- Commercial Paper
  - Liquidity has been pulled, as the mortgage market spilled into ABCP. Also, Jeff noted that SIV and SIV-lite structures have been having difficulty maintaining their investors lately as well. As liquidity has dried up, financing vehicles have been drawing on back-up liquidity (that said, liquidity providers are supposed to cover market disruption rather than specific credit events). Jeff also noted that while it was possible to get some stuff funded, it was mostly on a short-term basis.
  - KKR: Jeff noted that they have had a big problem (KKR Financial), and told investors that a workout was necessary. Jeff thought that CP investors would agree, reluctantly, as they are not really “looking for losses” given the low yields that they earn.
  - Unlike with the Accredited Carmel Mountain facility that we heard about some months ago, ABCP programs have now been extended (at the time of Accredited, there was great reluctance to actually extend one of these facilities). As a result, the spread has widened out between extendible and non-extendible facilities.
  - In unique situations, Lehman is willing to help CP customers out with liquidity issues, although they have no legal responsibility to do so. Jeff said that they had purchased less than \$1 billion of paper under “stressed” circumstances to support clients (Aegis Finance and Stony Point Capital) and currently had about \$1.5 billion in inventory – “agent purchases”. Of that, \$500 million is ordinary course of business. It was noted that Lehman would often rather buy the paper and wait for the market to improve rather than immediately move assets, which sounds operationally intensive. On the lending side, Lehman does participate in some backup liquidity facilities (for relationship purposes) but had not yet been hit as of the meeting. Total ABCP backup is around \$900 million, including to FCAR and GMAC. The underlying securities are sometimes retail and not

necessarily mortgages. Lehman is also involved in backstops when they are financing their own conduits.

- EMG exposure – The firm-wide risk snapshot highlighted Lehman’s EMG exposure for two out of the last four weeks
  - The desk is long \$232 million in three Kazakh banks through CDS versus short \$215 million of another Kazakh bank
  - The desk is overall long credit exposure, equity, FX delta, and local rates, with some shorts in Latin America ex-Brazil. In an EMG contagion crisis there would be a potential loss of \$111 million
- AMD – Convertible Bond purchase
  - The desk bought a \$1.5 billion, 5Y convertible at a 5% discount (rated B/CCC+). As of August 13, they held \$1.27 billion which was down to \$848 by our monthly meeting. This resulted in a net AMD delta of \$388 million which was hedged by a \$200 million short in the Nasdaq index. Spread PV01 was 285K, hedged by HY CDX and AMD 5Y CDS. Vega was \$6m/vol point. This position obviously resulted in some fairly significant idiosyncratic risk to AMD’s stock and credit spreads. As of August 13, the position was flat from a P&L perspective.

### **Backtesting**

- Lehman had a firmwide exception on 7/26, with a loss of \$148 million (VaR was \$82 million). Equities lost \$87m, munis \$18m on the back of muni/treasury basis, GTS \$26m on the back of equities positions, GPS \$28m on the back of credit spread moves.
- FID HY had an exception on 7/26 (\$41m) as all indices widened.
- FID CDO had an exception as Lehman priced and wasn’t able to sell an ABS CDO deal (Ceago – LBAM managed). This is a \$1 billion transaction that was currently \$74.2% ramped. They did cover 85% of supersenior risk (\$850 million Class A1) with XCL (apparently losses would have to be 2-3X current levels to lose money at that level). Also, the desk took over \$30m of MTM losses on warehouse assets at the end of the month, but this really isn’t a 1-day move (I believe this results from deal-break risk). As noted in the firmwide risk report, the desk is also concerned about two fully ramped deals: Lightpoint (\$500 million, 85% ramped) and Empire Square/Blackstone (\$750 million, 49% ramped).
- FID Munis had an exception from the muni/treasury basis. Apparently the desk is having to buy back some tender offer bonds, and muni CP is widening with the rest of the CP market.
- GTS had three excessions (July 23,24,25) resulting from their top 14 positions. ¾ of the days in August so far have been down for GTS.
- As mentioned above, equities lost \$87 million on 7/26, with losses across the board (e.g. vol flow, equity strategies US and Asia, etc)
- GPS had excessions on July 23,25, and 26, and the back of spread widening and single name versus index basis. Like GTS, they have a hefty event risk charge (like with credit trading).

- In addition, Paul Shotton has emailed Matt about two firmwide excessions since the monthly meeting, one occurring on August 3 and the other on August 6. I'm not sure why these weren't discussed at the meeting, so we will discuss the time needed to clean the P&L at the next monthly.

#### **FOR THE MEMO**

- Lehman Brothers announced the closure of its subprime originator, BNC, resulting in the elimination of 1,200 jobs. BNC's loan production had fallen to \$300 million per month from a peak of \$1 billion due in part to more stringent underwriting standards. Plans had recently been announced to merge BNC, based in Irvine, California, with Lehman's Alt-A originator and servicer, Aurora Loan Services in Denver, Colorado into one Mortgage Capital Division. We will continue to monitor plans surrounding the future of Aurora.
- Lehman's pipeline of non-investment grade commitments has declined significantly from the second quarter of 2007, but still remains large at approximately \$30 billion. Lehman is a one-third investor in the Home Depot Supply commitment, which was recently restructured with the sponsors to provide more attractive terms to investors. A few deals were closed and funded by Lehman in the weeks prior to our meeting, and several deals are targeted to close beginning in late September. Treasury personnel are closely involved in monitoring this situation as well and funding contingencies are in place.
- The real estate pipeline remains large at close to \$37 billion, including a \$10.5 billion commitment to Archstone. A third party investor has agreed to purchase a large portion of the senior debt of Archstone, and the deal is expected to settle in October. One deal securitizing a large office building in France was only partially sold before being pulled from the market due to pricing levels. We will continue to watch this space for any further contagion from the fallout in the broader credit markets.

### MONTHLY RESULTS (ED GRIEB)

- August revenue was \$669m, well below average month '07 of \$1,967m.
  - FID reported a loss of \$298m versus an avg month '07 gain of \$750m. Within FID, credit products reported a \$290m loss in leveraged finance and a \$137m loss overall. Securitized products had a \$290m loss as origination and volumes were weak. AAA-rated securities were marked at 350, levels at which traders “would never sell” as fundamentally they feel the values are higher, but there was no dispute from traders on the marks as clearly these were the market marks. Real estate and munis were also weak. Liquid products, especially Interest Rate Products in Europe, were good with one-off trades. Client activity was fairly strong across fx, prime services, and IRP.
  - Equities had a gain of \$452m, below avg month '07 of \$549m but still above avg month '06 of \$325m. Execution services and volatility had good customer flow. Convertibles were down, and GTS suffered losses from prop positions. Quant funds had losses of \$100m overall.
  - Investment Banking had revenues of \$304m, only slightly below avg month '07 of \$383m. The GE Plastics deal closed, while equity origination was down slightly.
  - Investment Management had revenues of \$211m versus average month '07 of \$285m. AUM reached \$275bn. Gains from minority stake positions were down to \$40m from \$55m last month, and they wrote down the DE Shaw investment because of losses from quant strategies. GLG quarterly reset is due **in September (right?)**. PIM was strong during the month.
- Revenues from Europe and Asia accounted for 53% of the total revenue in the quarter, both because the regions performed well and because of U.S.-based markdowns in leveraged finance and mortgages. The long-term goal continues to be to have 50% of revenues come from non-U.S. sources, although Lehman is still below that on a normalized basis.
- Cash capital excess was \$8.1bn in August, up from \$5.2bn in July, as the firm continues to strengthen its liquidity base. LBI's excess capital declined to \$2.538bn from \$3.181bn, as VaR charges were up \$272m, finance charges were up \$50m, and Reg Y charges of \$150m associated with the Home Depot Supply bonds were assessed. LBI had net revenues of \$20m with net income of (\$43), again associated with split hedges for securitized products with LBSF.
- Lehman took \$44m of charges associated with MCD changes. Of that, \$27m was a goodwill writeoff for BNC, \$17m was for fixed asset and lease exit costs for smaller facilities, and \$10m was for BNC compensation costs. They expect



further lease charges of \$15-20m to come through in the fourth quarter as the larger facilities are closed. They also expect further downsizing charges of \$15m in the fourth quarter from changes to Aurora and the UK and Korea platforms, but these changes will most likely be embedded in the compensation line.

- We received additional information on the significant valuation reductions, most significantly on leveraged loans and mortgages:

Leveraged Loans	(763) after hedges and financing fees [(1,300) gross]
Mortgages	(152) after hedges [(1,470) gross]
Real estate	(226)
CLO	(107) (warehouse positions)
Munis	(58) (basis losses)
Total	<u>(1,306)</u>

FID share of Treasury  
debt MTM 595 (70% allocated to FID of \$850, 30% to equities)

Net	(711)
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- The tax rate for the quarter was 26%, below average '07 of 32%. The tax rate was adjusted downward for the quarter in order to make the annual rate 31% given the downturn in business, as well as the increasing importance of non-US business.
- Lehman issued \$3bn of Long Term Debt the day before our meeting. More to come from the Treasury folks.
- September had been “ok” so far in terms of revenue. There were 2 loss days in equities, with average revenues of \$20m/day but with especially good returns in the days since the Fed’s announcement.

## CREDIT RISK (STEVE SIMONTE, VINCE DIMASSIMO)

### Counterparty Credit Risk (Steve Simonte)

- CE rose to \$39.7bn from \$37.1bn. The increase was due to higher swap exposures to CDOs. Four CDOs were in the top 10 for exposures, including Pyxis (\$566m CE), MKP Vela (\$559m), Corona Borealis (\$479m), and Libra (\$476m). Lehman was the underwriter for these CDOs, and there are some other smaller exposures, but these are the main ones.
- MPE rose to \$126bn from \$119bn. Similar to last month’s story, the increase was due to higher volatility and higher spreads.
- Steve walked us through the transaction structure for the Pyxis CDO. Putnam acts as collateral manager for the CDO, which entails acquiring and managing collateral in exchange for fees.
  - The assets for the CDO include CDS on a number of different underliers. There are \$1.35bn in synthetic RMBS assets (49% subprime, 41% mid-

prime, 5% ABS, and 5% CMBS). A cash reserve account of \$457m is held against these positions. There are also \$155m of funded assets, including \$58m in CMBS, \$5m in cash, and \$92m in CDOs.

- The capital structure includes a number of different classes. \$560m are funded notes which receive payments in a sequential manner. The top of the capital structure, Class A1 VFN worth \$945m, is owned by CIBC and only funds if needed.
  - Lehman acts as an intermediary between the CDO and many counterparties who are buying protection from the CDO. Thus, Lehman is exposed to credit risk arising from the protection it has bought from the CDO. As the creditworthiness of the underlying RMBS has declined, the value of the bought protection has increased, leading to increased in credit exposure. The CE of \$566m is approximately 40% of the \$1,350m notional protection written.
  - There have been no losses on the underlying securities yet. As losses are incurred, the CDO would utilize its cash reserve from the funded notes, and then go to CIBC to get funding from the currently unfunded notes. Lehman, as an OTC derivatives counterparty, is at the top of the waterfall in the order to be paid.
- In addition to Pyxis, two other CDOs were on the top 10 list – MKP Vela and Libra CDO Ltd.
  - The only other counterparty credit exposure discussed on the top ten lists was to River Trust Acquisition, a BB- rated counterparty, with CE of \$33m and PE of \$93m. The exposure comes from rate hedging for the Archstone transaction.
  - Counterparties discussed that had been highlighted on the Firmwide Risk snapshots include:
    - Sentinel Management Group defaulted on repo margin calls totaling \$24m. They filed for bankruptcy and Lehman has liquidated their collateral positions, leaving a \$14m deficit which has been written off. They are in legal proceedings now to recover that money. It is unclear whether Lehman will be forced to deal with investors on an agency basis or whether they will be dealing with Sentinel as a corporate entity.
    - Horizon Funds/United Capital positions were liquidated and Lehman was paid off. Most (all?) of the bonds were taken into inventory at prices at which the desk were happy to hold them, as there were no bids at auction for the collateral.
    - Sailfish is having difficulty liquidating positions including perpetuals and mortgages. Losses were from corp bond CDS basis and markdowns and liquidations of perpetuals, FRNs and mortgages. The fund has met margin calls but is facing \$320m of redemptions for 9/30. CE is \$0.2m and MPE is \$0.8m but they are increasing the margins on the perpetuals and corp bonds to capture the higher liquidity risk.

- Carlyle Capital Corp. has incurred heavy losses. Lehman exposure includes \$3.8bn of repo financing on agency CMOs with a 2% haircut, with a view that there is sufficient equity to cover CE and MPE. This fund has received a lot of support from Carlyle, which has given it a permanent capital base.
- Lehman has a €70m deposit at Northern Rock. They also have a £6m unfunded relationship loan and \$5.6m derivative mtm. The main issue is the deposit. Failing to renew could damage the client relationship and send a negative signal to the Bank of England. Lehman ultimately chose not to roll the deposit.
- C-Bass is currently in its fourth standstill agreement with creditors. Three bidders have largely completed due diligence, but a sale is not certain at this point. Lehman's current exposure includes (1) \$150m participation, with \$115m funded, on a syndicated warehouse facility, (2) \$23m cash outstanding under repo agreements vs. \$37m collateral on sub bonds/residuals, (3) \$28.7 undrawn commitment to defensive DIP facility being arranged by JPM, and (4) \$104 mezz ABS CDO warehouse where the MTM risk is C-Bass.

#### Leveraged Finance (Vince Dimassimo, )

- The pipeline of unfunded commitments stood at \$26.472bn as of 9/19, down from \$30.873bn as of 8/15. The amount of funded commitments stands at \$7.182bn, up from \$4.097bn as of 8/15. New fundings include: (1) \$1.969bn funding of Home Depot Supply, (2) \$757m funding of USIS commitment, (3) \$385m funding of Endemol Holdings, (4) \$345m funding of Vertrue Incorporated, (5) \$90m funding of Cenveo Corporation.
- Specific deals discussed include:
  - Home Depot Supply (\$1.969bn funded) was restructured at the last minute, with a decrease in sale price and a decrease in leverage. The structure was changed as well to include an asset backed term loan, notes, and a revolver and term loan guaranteed by Home Depot, an IG counterparty. The syndicate has agreed to a 30 day standstill to syndicate the loans. Lehman booked the position in the broker-dealer, and because of the 30 day standstill, Mike Machiarolli and Grace Vogel agreed with Lehman to Reg Y capital treatment for the position.
  - Allison Transmission (\$970m funded). All the bankers are working together on the syndication until the end of October. \$1bn of term loans were sold at a price of 96. Lehman has ¼ of the transaction, \$250m. The syndicate also closed on \$500m of debt at 96.5. [I'm confused by the reporting – as of 8/15 they had \$775m of bank debt and \$275m of bonds for a total of \$1,050m, and as of 9/19 they had \$970m of bank debt. The overall reduction is only \$80m. How are these latest sales reflected?]

- TXU (\$5.237bn commitment) received its final approvals from shareholders and the Nuclear Regulatory Commission. Lehman expects the commitment to fund in mid-October. They are engaged in restructuring discussions with the sponsors.
  - First Data (\$3.255bn commitment). One leverage covenant was inserted into the deal, and syndication was launched this week. The syndicate is working together, and is first selling off a \$5bn piece priced at 96. They are receiving a lot of interest at the road show (described as standing room only). So far, they have resisted providing financing for the purchase of the debt.
  - PHH Corp (\$1.703bn commitment). This commitment consists of two separate businesses being acquired by two different sponsors. The first, PHH, is a mortgage operations. The second is a GE automotive fleet management company. The close date is in October, and if the first deal does not go through the second one will not either. The deal has run into some issues with Chase saying that some of the collateral for repo did not fit their eligibility criteria. JPM is the lead bank, and Lehman had a somewhat “hands-off” demeanor.
  - Houghton Mifflin (\$2.398bn commitment) is not expected to close until 2008.
- They ran through the list of deals and highlighted those that had been committed to during the second quarter. The deals, including Houghton Mifflin (\$2.398bn), Alliance Data (\$1.322bn), TRW/Mando (\$650m), and Varel Holdings (\$230m), all contain covenants and flex and no PIK toggle features.

## **MARKET RISK (JEFF GOODMAN, PAUL SHOTTON)**

### Paul's Update

- Only TBAs and options got through the credit calculation in the broker
- Lehman has not had significant mortgage-related collateral disputes
- Contagion moved up the credit curve in August. In addition, market volatility increased, with the Vix doubling between mid July-August. Credit spreads were volatile across HY loans, HY trading, and HG trading/commitments.
- Risk Appetite was at \$3.68 billion, up from \$3.3 billion August 14. Peak RA was \$3.73 million, with FID as the major driver (VaR was \$119 million this day). The changes were primarily driven by the Americas region, and credit specifically. The limit for Risk Appetite was increased from \$3.3 billion to \$3.5 billion using the standard methodology (Ed Grieb walked us through the process again at the quarterly P&L review that followed this meeting). In short, Lehman could increase overall risk appetite as revenues were coming in above initial projections.
- The Firmwide VaR limit was also increased, to \$135 million. Divisional limits remained unchanged for now, but will be higher in the future. Paul noted that they don't want to force liquid business to cut back in order to remain under limits, at the

cost of only being left with illiquid positions. VaR on 9/14/07 was at \$110.4 million, versus \$96.7 million last month, with much of that increase coming from HY loans and HY trading.

- FID went from long \$1.1 million/bp to short \$1.25 million/bp. Equity delta, which was in the \$3.5 billion range in July, tended to be more in the \$1-2 billion range in August. The morning of the meeting it was at \$2.4 billion, up from \$2 billion the prior day (I think Paul gave us these numbers to highlight their repeated assertion that equity delta can have large swings on a day-by-day basis)
- There were 4 block trades in equities, 3 of which were fairly small and then the \$1.5 billion AMD convertible block (now down to \$655 million). At the time of the trade, net delta was \$700 million, but that is now down to \$58 million. The block was purchased at a 5% discount. The stock price has since risen, but the desk had already hedged the position, limiting the gains.

#### Commercial Real Estate Update (Kenny ? – head of CRE)

- The capital markets have largely shut in this area, with loan origination stopped in its tracks. They've had few financing inquiries lately, as the market digests its current commitments. Kenny noted that some liquidity had returned in August, but was no longer there. He did stress that the underlying credits are still strong, and that this is a liquidity issue.
- On a recent \$2.4 billion floating rate issuance, with \$1.5 billion of AAA, Lehman was able to sell the AAA and the bottom of the stack ("a pleasant surprise"). However, there was "indigestion in the middle" with AA and below being difficult to place. Typically, over half the buyers are European banks. For this deal, all of the buyers were domestic money managers who thought they were getting a good deal.
- A week after that issuance, Lehman went out with a \$3.4 billion fixed rate deal, which was oversubscribed on the AAA. The rest (mezz) was more challenging, although this only constituted 8% of the total deal. Therefore, they were able to move around 90% of the capital stack, and already pre-sold the non-IG pieces. Kenny did note, per his liquidity comment, that he didn't think he could have placed that deal in mid-September, when we had our meeting.
- There is some activity in the secondary markets, where AAA has tightened (10Y fixed rate went from swaps +23 to +80 and was around +60 at our meeting). BBB had blow out from swaps +70 to swaps + 350-400. Apparently 92% of secondary trading is done at the AAA level, as most of the lower-rated product is held by pensions and insurers, who tend not to be active traders.
- As for hedging, Lehman uses the CMBX and TRS. He said that the CMBX is very liquid for AAA, which again is the bulk of the capital stack – therefore, you can "perfectly hedge 95% of the deal). Kenny noted that last year, the cost of hedging was expensive (you weren't getting much benefit from a ~10 bp move, which was apparently considered likely). In December, the cost fell slightly and Lehman started hedging more (beyond just rate swaps). When a hedge would allow the desk to lock in profits, they did so (In 05 and 06 the desk tended to be naked and made money as spreads had tightened). Currently, 92% of the whole loan book is hedged.

- Kenny noted that it was quiet on the originator side, and that there was a disconnect between owners and lenders, in that owners were still expecting higher prices and did not seem to understand the extent of the market disruption. Also, there is a lag in capital rates going up to reflect the reduced amount of financing. Term sheets in this place have lots of outs, and while a buyer gets a ‘moral commitment’ early in the process, the actual commitment letter is usually only signed one week prior to funding by industry practice (at this point the rate gets locked). Lehman has not been walking away from these commitments, but has been changing costs to keep the loans above water. Kenny noted that they felt this was an opportunity to assert themselves in this marketplace as a player that would be there even during tough times. Kenny also said that in CRE land it's easier for purchasers to renegotiate a purchase price (than in the corporate space) and that there tends to be more give and take and less overt hostility.
- Projections have also become more conservative. In the past, \$10 million of rent might generate a base case of \$9 million, while in the recent past the same \$10 million of rent would lead to a growth assumption resulting in a base projection of \$12 million. Now, the trend is back to discounting today's cash flows.
- Archstone: The deal is to close on October 5, with \$7.1 billion going to Fannie and \$1.8 billion to Freddie (both should fund simultaneously). Lehman was currently on the road with a \$4.4 billion term loan – Kenny did say that “Fannie and Freddie bailed us out,” although then seemed a bit unhappy with his choice of words. Also, there has been a good deal of interest in the equity, but everyone wants to know what the capital stack will look like, which is only now being firmed up.
- Hilton: Lehman has not yet taken a markdown, although they feel that this position is currently close to flat. There is still price flex (60bps structural, and 50 bps capital markets) and these haven't been exhausted yet. However, Kenny said that it's hard to flex Blackstone. Blackstone has all the equity in this deal.

#### Mortgages (Jeff Goodman)

- While August started as a bad month, Lehman has done 7 deals, with \$4 billion in non-agency collateral. The percentage retained is up, and nothing has been done in September. Jeff said that basically the desk is saying “stuff is cheap, call the bottom, come and play” to investors, but noted that he personally thinks that waiting until year-end might appeal to investors who think that dealers will be trying to clear their balance sheets.

#### Backtesting

- At the end of August, Real Estate had a \$34.7 million markdown resulting from CMBS in Europe. Europe tends to be less hedged than the US, and the hedges that were on consisted of forward sales of AAA which were limited in quality. When AAA spreads moved, the desk took a writedown.
- Munis had some big losses and another of VaR excessions as the BMA/treasury basis moved out (the desk is long munis and short treasuries). The moves in this area were “unprecedented.” Jeff also mentioned that auction rate securities have had disruption, similar to the ABCP market. There are \$307 billion outstanding of these securities

(61% of this is tax exempt). The Auction Rate Desk is a placement agent, and recent issues have had auctions that have not cleared. Lehman now has inventory of \$1.6 billion, of which \$722 million is wrapped. Of that \$1.6 billion, \$520 million is a result of failed auctions. Risk on that \$520 million is estimated to be \$25 million if spreads widen by 25bps.

#### **FOR THE MEMO**

- The leveraged lending pipeline continues to work down slowly, as total commitments in the non-investment grade space (funded and unfunded) fell to \$33.7 billion from \$35.0 billion. The reduction is the result of both the syndication of small amounts of deals and the restructuring of commitments to lower amounts. As many more deals are expected to work through the system in the coming weeks, we will closely monitor the situation in this market.
- Lehman's counterparty credit exposure rose \$2 billion last month as the result of increases in exposures to four Collateral Debt Obligation ("CDO") vehicles. Lehman has purchased protection from these CDOs on RMBS assets. As the value of this protection has increased with the deterioration of mortgage assets, the current exposure to the CDO has increased. The CDOs are structured with cash reserves, as well as recourse to unfunded note holders in the case of asset defaults. [check this is true with all structures] Credit risk management is closely monitoring this exposure.

### **MONTHLY RESULTS (ED GRIEB)**

- Net revenues were up in September, at \$1.3 billion (Ed mentioned that October was looking like a strong month, with MTD revenues of over \$1 billion). September's revenue included a \$300 million loss as Lehman's spreads tightened (the structured note business which had a \$500 million gain a few months ago). They expect to book another \$100 million loss of the same variety in October.
- FID: Credit and SPG had lower revenues, but both were positive this month (\$100 million each). The European mortgage business had a downward valuation adjustment on mortgage residuals (see discussion in market risk section). Real estate make \$40 million, and GTS and GPS were up on their FID positions. Liquid markets prop (John Hoffman) made \$200 million. Also, munis clawed back some of the prior losses (\$70 million). They were down \$100 million in August.
  - This came up in a later discussion, but apparently HY is still up \$1b YTD, and mortgages are still running a profit (although down compared to 04 and 05).
- Equities: The business continues to do well, with cash and volatility up 25%. GTS and GPS also did well on their equity positions. There was increased revenue both in corporate derivatives and customer activity.
- IB: Revenues were down, not much closing on the M&A side. Origination is also light.
- IM: Revenues on par with averages, Fees on the MLP fund were down (they gave back on some accrued fees). AUM was up slightly, while PIM revenue was down.
- Europe had a low month with \$327 million in revenues, while Asia was relatively strong.
- LBI update: Lehman moved \$150 million of residuals out of the broker into LB Pass-Thru (a sub of LBCP) so they don't get a 100% charge – apparently Mike told them to do this. LBI excess capital was up \$500 million, as the broker made money in September (John Hoffman's business is in the broker, and there was less erosion in mortgages). LBSF also paid a \$350 million dividend, in part due to \$300 million of restricted securities in the broker (NYSE shares) that needed to get a 100% charge.
- Capital ratio: Lehman is not comfortable with ending the year at 10.5%, which is looking somewhat likely. They have spoken with Paolo about a hybrid issuance, which will probably be done within the next 1.5 months. They are shooting for above 11% for the first disclosure.



- Regulatory update
  - FINRA: Tony and Laura noted that for the FinOps exam, FINRA sent the same number of auditors (4) to both Lehman and Neuberger Berman. The CSE exam kicks off October 29. Laura and Tony had a chat with FINRA, and they're putting some items on hold (but not taking them completely off the table) pending the receipt of a year's worth of VaR and P/L. Based on this data, they'll select businesses to look at in more depth, request policies and procedures on these areas, etc. Apparently they are also looking at risk management, and Beth wants FINRA to leverage off of the internal audit work on risk management.
  - OTS: They're almost done with their holding company exam, and have found nothing major so far.
  - NYRO: NYRO has left the premises, and are finishing up with requests and doing some wrap-up work. Lehman is in the process of correcting some "misunderstandings" which arose around problems with pricing of inventory versus positions financed (apparently this has to do with lots of trade cancels in the blotter which Laura is trying to explain to NYRO).
  - Japan FSA: They've been asking holding company questions based on the 10Q. Ed said that Lehman is going to try and answer generally, they think that the FSA is essentially trying to get educated. They wanted a breakdown of the \$700 million loss in FID during Q3, and Lehman was going to try and fulfill that with a high level response, but seemed willing to provide more detail if that didn't satisfy them.

## **CREDIT RISK (STEVE SIMONTE, VINCE DIMASSIMO)**

### Counterparty Credit Risk (Steve Simonte)

- CE rose by \$2.5 billion, while PE decreased by \$4.5 billion. The CE was a widespread increase, while the decrease in PE was a function of implied vols being lower by the end of September.
- Non-IG counterparties are currently 3% of CCE and 8% of PE (the disproportionate nature of this is due to the fact that non-IG tends to be collateralized, and therefore generate little CE).
- The four CDOs discussed last week, that are on the top 10 IG counterparty list, have moved up slightly in terms of CCE due to further deterioration in prices. The highest CCE is to Pyxis, at \$614 million, followed by MKP Vela at \$590 million, Corona Borealis at \$534 million, and Libra at \$503 million.
- There was a new CP on the top 10 non-IG list, Natural Gas Pipeline Company of America. This is related to an Eagle transportation transaction. Steve said that this is a very conservative measure, and the

real risk is yet. CE for this counterparty currently stands at \$36 million, with a PE of \$90 million. Highlighted names on the MPE list for this group of CPS were E\*Trade (nothing new, just securities borrowing) and GMAC LLC, which is on the list as a result of additional rate hedging.

- The usual suspects were on the top 10 hedge fund list, with Capula Global Relative Value master fund being highlighted by Steve as the “least experienced” on the list, but they do have about \$4 billion in AUM. They are doing fixed income arbitrage with Lehman.
  - Ellington was highlighted on the firmwide risk snapshot. They have suspended redemptions in two of their funds due to difficulty in obtaining valuations. Lehman has exposure to the two funds through repo, ABS CDS (both sold and bought), and rate swaps. However, Ellington continues to meet margin calls, and Steve did not seem particularly worried about this (no one seems to think it’s a liquidity story, but rather a true valuation one and a desire to be fair to both exiting and remaining investors while calculating redemption value).
- On the top 10 energy exposures, Steve highlighted Columbia Gulf Transmission Co, another Eagle transportation contract. CCE is given at \$1.9 million, but again Steve thinks it is overstated and closer to \$100k. PE on this trade is \$396 million. It might be worth discussing the methodology for capturing these types of trades, especially to the extent they do a number of them.
- Linn Energy – Lehman put on a hedge for Linn in July, consisting of deal-contingent (since realized) swaps and puts on nat gas and oil. Current MPE is \$405 million. Linn asked to convert the puts into swaps to fix the gas price, a move that increased Lehman’s exposure to Linn. At the time of the firmwide risk snapshot, MPE was expected to rise to \$646 million, but Vince said that subsequently MPE was found to only be \$500 million. The original \$225 MPE limit is not changed. Lehman was above that limit prior to the restructuring of the trade, and so is obviously still above that limit (now to a greater degree). Jeff cited the old “right-way” risk story, and apparently Lehman has had “strong interest” in assignment of some of these trades, for about \$100 million of MPE. They didn’t mention how they would lay off the rest of the MPE – I’m not sure how deep the single name CDS market is in this name. We should follow up next month. Lehman also has a \$290 million in equity interest in Linn, through direct ownership and MLP funds – I wonder if this makes them more comfortable with running over their limits?
- DPC update – per Michelle’s email exchange with Steve Simonte, we had an update on Lehman’s trading with DPCs and ACA, the monoline.
  - Lehman is really only trading with Primus (\$6m PE, \$2m CE). They also have some exposure to Theta, a Gordian Knot DPC/SIV hybrid (\$4m PE and \$3m CE). Lehman prefers to deal with DPCs

selling single name protection, and is currently looking at a small universe of new trades. Steve also noted that Lehman has a \$45 million investment in a DPC called Quadrant, which is split between GPS and FID. This triggers “healthy discussions” as credit is encouraged to be more charitable towards DPC as counterparties (same thing we heard at MS).

- ACA: this is the weakest of the bond insurers, and is closer to a structured finance vehicle than a true insurer. Less than 20% of its business is wrapping munis, and ACA has high subprime exposure. Lehman is keeping an eye on their Q3 earnings – they must disclose MTM losses on a GAAP basis if they cause impairment to equity on a GAAP basis. While agencies say this won’t matter as their rating is driven by the loss-based model used for bond insurers, Lehman is not sure how long they can preach that line if losses are big enough. This is all relevant because if ACA were to hit BBB-, then they would be forced to post collateral which would effectively be liquidation. They are currently rated A. Lehman had a due diligence call with them tomorrow, but noted that this is “not a great picture.” One of the only positive marks was that ACA had managed to bring themselves back from the brink two times over the past ten years, and maybe they could do it again. Lehman has exposure to ACA through the purchase of protection on tranches of the ABX (06 BBB and BBB-). There are three trades, notionals of \$300m, \$225m, and \$420m. CE on this is \$270 million. In addition, Lehman purchased \$750 million in supersenior protection from ACA when the market shut as they were placing the Corona Borealis deal. This has a high attachment point (50%), and currently has a negative mark (i.e. no CE). Lehman noted that ACA was not the “layoff of choice,” but that some protection was better than on protection. They also said that there was no market to buy protection on ACA.

Leveraged Finance (Vince Dimassimo) *(much of this businesses was discussed during Jim Seery’s presentation, so credit’s coverage of this was much briefer this month)*

- The total pipeline of unfunded commitments stood at \$39.9b as of 10/15. The amount of funded commitments stands at \$8.9, up from 7bn last month. HY commitments are at \$29.6b (\$7.3b funded), and HG commitments are at \$10.3b (\$1.6b funded).
- Specific deals discussed include:
  - AHMSA Restructuring loan – Lehman has been asked by a Mexican steel producer, AHMSA, to provide debt financing for its exit from bankruptcy (which was declared in 1999). Three hedge funds, currently creditors, will convert their debt positions in equity in the new company, while other

creditors will get paid out at par (not such a great deal, apparently Mexico no longer allows filings under this type of bankruptcy as it isn't so great for capital market formation). Financing will likely include a \$1 billion bridge loan, which will be taken out by senior notes. The commitment will include business and market MACs.

- New HY commitments include Arysta LifeScience, for \$1 billion, and Regent Seven Seas for \$150 million.
- Lehman is keeping its eyes on Alliance Data, which is big and at off-market terms. Lehman has \$1.3 committed in this deal, which has been restructured with Blackstone – not to today's terms, but hopefully to something that is more acceptable to the market.

## **MARKET RISK (JEFF GOODMAN, MARK WEBER)**

### Risk Appetite/VaR Update

- Risk appetite was at its all time high, at \$4.3 billion (up from \$3.7 billion last month). The limit stands at \$3.5 billion, and was just increased a few months ago. Jeff said that RA has been bouncing around, but has been at \$3.5b and up since August. Before, however, he said that HY and RE had been driving the increase throughout the summer. Today, equities is been ramping up their risk, with increasing deltas in the US and Asia (peak equity division delta was \$3b, and peak FID equity delta has been \$1b. GTS can also run some pretty big delta positions). In addition, there has been less gamma mitigation lately. Previously, while both FID and IMD were at their limits, equity was under its limits – that said, it has since gone up to and over its RA limit (usage is at \$1b versus a limit of \$800m, and equities was at \$400m when the limit was raised to \$3.5b). Finally, the correlation has been increasing between FID and equities – in other words, all signs are pointing in the same direction. Jeff noted that businesses were taking views in the market, citing both equities and EMG. Jeff and Mark noted that you could lower risk, but it would come at a cost for illiquid positions that would essentially be “forced to sell.”
  - Mark walked us through a graphical breakdown of RA by division, and said that much of the firmwide increase from 8/31 onwards was driven by the increasing equity delta. You can see a roughly \$300 million spike in the FID Usage when First Data was funded (\$2.1b). Overall, HY RA was up \$500m on the month, in agreement with the VaR increase of \$14 million (mentioned below as well). By region, the increase is overwhelming coming out of the US, driven by the HY business and the largest chunk of the increased equity exposure.
  - IM has been running high, currently at \$1.2 billion. This can be sticky as they warehouse for future LB funds. For some funds, like the RE mezz fund, there are only 9 investors so there is more flexibility in terms of trying to close the fund early. However, another RE fund has 100 investors which makes it much more difficult to be flexible.

- Not all deals (not sure if this is not all deals, or not all risk in deals) are captured pre-funding, so when a deal funds it has a big affect on RA usage. Some of the more illiquid deals (HD Supply) are working out (not sure if it has been distributed yet), and they are seeing progress on some RE bridge equity. Lehman has very little corporate bridge equity (they do have TXU but Harman is now gone).
- The executive committee signed off on this limit excession, as they are OK with the macro risk. Apparently, they are not so “stuck on the minimum ROE of 10%” that the RA methodology is based on, and 2008 budgeting is occurring in 40 days and theoretically, the new limit is north of \$4 billion anyways. Also, they mentioned something about “not losing as much as everyone expected them to” so now they can go in and be opportunistic – I believe that this was referred to as the Goldman Sachs approach. It was hard to listen to all of that with a straight face, and I told Jeff that while we were not second-guessing the Executive Committee, it was a bit difficult to reconcile these rationales with the story we’ve heard over the past three years. Also, it’s a bit concerning that all of this is occurring when the CRO position is in transition – it’s unclear who, if anyone, is actually running the group right now (although at least nominally Madelyn is in charge until December 1, when Chris O’Meara takes over). Jeff admitted that they probably shouldn’t have raised the limit to \$3.5b when they did, given that they were almost there and there wasn’t enough headroom. Also, it appears that the firmwide risk meeting is cancelled on a not-infrequent basis. For example, this month we were given only two firmwide risk snapshots because the other two meetings were cancelled, and it turns out that the October 15 meeting was not held as well so the snapshot we were given was to be presented at the October 23 meeting. I asked why meetings were cancelled, and was given a multitude of reasons from holidays to offsites.
- VaR increased to \$158.8 million on the back of lots of volatility in August (so new volatility rolling into the time series) while positions were increased. HY VaR alone rose \$13 million. FID VaR was at \$76.4 million, up from \$65.4 million last month. Equities was at \$47.7 million, up from \$18.6 million last month. FID is just slightly over its VaR limit of \$75 million, while equities is well over its limit of \$35 million.
- Equity VaR peaked at \$49.2 on September 27. Again, this is primarily a delta story (although there is less gamma and some short vega positions – which apparently drove the one equity division VaR excession). Most of this has been directional risk taking put on through the indices, often the S&P. The increasing delta was sometimes a function of cutbacks on short positions - the desk ended September 11 short \$367 million of S&P, which was less short than the prior month by \$800 million (the prior month they were short \$1b).

#### Firm-wide Risk Updates

- Lehman has EMG exposure to Kazakh banks, a story we have heard at other firms as well. This is through outright loans, CDS, and cash positions. In a default situation, losses are estimated to be 50m. Kazakh banks have been experiencing liquidity problems recently, and the country may be downgraded. Jeff noted that Russian mid-tier banks are facing some of the same challenges.

- FNMA 30Y 6.5% mortgage position - the mortgage trading desk recently decided not to roll \$29 billion out of a \$35.5 b long October settlement/short Nov settlement roll position. This is a financing position similar to a repo – price of the roll is between the cost of carry and a maximum of fail cost driven by demand for the securities (akin to treasuries being on special). The desk, by not rolling, essentially forced delivery of these securities, and \$4 billion failed resulting in \$1.4 million in profit (basically resulting from getting a free coupon during the fails). The market risk of the delivered securities is hedged with the short positions for November settlement, when these will be delivered, and the funding risk is mitigated as long as agency funding rates do not go over 5.2% for an extended period of time (they are currently at 4.8 to 4.9%). This seems like a huge notional, and it does require a good deal of balance sheet. By delivering in November, the desk intends to take that amount down. Apparently, these types of fails do get resolved quickly so you can make a profit (albeit small) while not incurring fail charges in the b-d, where these positions are housed.

#### High Yield Loan Trading (Jim Seery)

- Jim manages the leveraged loan business for FID (Fred Orland does the bond side). He sits on the commitment committee as well (Jim in NOT in investment banking, who does the origination of these loans).
- Jim started the current timeline with Jardin, a \$725 million deal that was placed in early August at 97 ¾ . There were existing HY bonds and loans on this name, and the deal had covenants.
- After that came Alison Transmission, which was a bit more difficult. That said, almost all of the loan is now sold (79m of a 750m position is left), and all bonds have been sold. Citi was the lead on this, with LB, ML, and Sumitomo participating. LB and ML were the most aggressive, while Sumitomo was more reluctant to move the loans at a discount. An initial tranche of \$1.2 billion was sold at 96 with a “most favored nation” clause which goes through November 11 (MFN clauses are now longer in duration due to investor demand). In addition, if one lender sold down positions on their own, then they have to make everyone else’s MFN payment. Around the time of the Fed announcement, they sold \$585 million at 96.5, and sold another \$1 billion at 97.5. Senior notes priced at 11 ¼ and then traded up to 103.5. Following on this success, they brought the PIK-toggle notes in at ¼ wider than the senior notes – they initially traded well but have since been off, around 99.
- Next up, First Data – The \$9.2 billion of loans was placed in 3 tranches between 96 and 97. In the 2 days prior to our meeting, Euro issuances were sold as well. Jim noted that Europe has been starved for new issues and has shown interest. The bonds are currently in the market. Also, Jim noted that HSBC had 20% of this deal and decided to hold it – it didn’t want to sell at 96.
- TXU was launched on the Monday prior to our meeting – the deal was being shown at 99.5 but Citi was taking orders at par. (Jim noted that Citi was being “more controlling” in this deal than with Alison). So far it sounded like the book had over

\$7 billion in orders, with over 90% of those being at par). They might upsize the tranche to \$10 or \$12 billion, possibly at a slight discount still (Lehman would prefer to keep the discount and move the position off their books).

- In terms of buyers, Jim said that the CLO bid is gone. He said that new buyers were real money bond funds that have the flexibility to purchase loans (e.g. Fidelity, PIMCO, WAMCO). Also, the hedge funds have come in but they want leverage – Jim pointed out that they are looking for mid-teens returns and even with leveraged loans paying 4-500 bps this won't get them there. Lehman has provided some leveraged on the USIS deal, with a daily MTM, at 3:1 leverage (i.e. a 25% haircut). This appears to be the only type of seller-financing that they have done. Jim also noted that with First Data, there were 9.5 billion of orders “non-financed” and 6-8 billion of orders that were “financed” or needed financing. The syndicate did not need to take any of the “financed” orders. Lehman had inquiries from 60-70 accounts that wanted financing, such as hedge funds, bond managers, pension funds, sovereign wealth funds, etc (Jim seemed a bit surprised that sovereign wealth funds were looking for leverage). In addition, the recently formed credit opportunity/loan funds are looking to buy. Lehman has one of these funds, which will have 3.5x leverage, leaving it with 2.5 to 3 billion to invest in total (strictly in loans). Jim also said that the private equity shops are setting up these funds, which can be unseemly in that they want to buy their own credit at a discount. My sense is that Lehman tries to watch out for these sorts of reputational issues.
  - CLO note: Lehman has done 7 CLOs since June, which have involved restructuring and reduced fees. That said, Lehman has not had to “blow out” any managers (which effectively involves taking back the positions as their own inventory as opposed to positions being warehoused on behalf of a manager).
- In terms of the forward pipeline, Jim considers TXU to be the bellweather. He thinks that marks will recover somewhat, and that fundamentals in the market remain OK – at a micro level at least, with the macro being slightly less ideal. He said that current margins are 350-450 on loans, and 11 to 12.5 % on bonds, which feels reasonable to him. Jim's group will be involved in selling down the HY component of Archstone.
- The commitment committee is seeing more activity, albeit without the PIK-toggles and cov-lite deals. Leverage is coming back down (no more 7-8x) – overall, transactions appear to be capped at 6x right now. In addition, deals are smaller. Jim cited Verel as an example of the new landscape – this is a company that makes drill bits for oil and gas, and will have 3x leverage. The price is good, and the deal has full covenants. Lehman is also participating in an add-on facility for TRW, which they may split with JPM. He expects the large deals to come back, but not in the size they were before – probably more in the 3-4b range. In addition, there will probably be more robust MACs and covenants like minimum EBITDA. We briefly discussed Hilton, and Jim feels that if they had to price it as a HY loan (as opposed to a CMBS deal) they could probably place it, although he did mention that in the HY loan space, investors tend to get nervous as you move further away from the actual asset.

- In terms of what would change his attitude, Jim said that a big default could prove very problematic, as it could give the new investors entering the space pause and dry up this “new” wave of liquidity.

#### Mortgages (Jeff Goodman)

- Securitizations are still continuing in the Alt A and jumbo space – Lehman moved \$2.9 billion last month. That said, last month Aurora only had \$700 million of production, off a peak of \$6 billion a run rate around \$3.5-\$4 billion. Jeff described this sort of run rate as “paying an option premium” in that they are keeping Aurora “overstaffed” in order to be ready to pick up origination when prudent. They have been purchasing some loans, sometimes on an opportunistic basis (e.g. purchases of American Home product out of an auction).
- Lehman has not done a subprime deal in 3 months
- Liquidity is back in the AAA space, and spreads have tightened (from 100 to 90 for Alt-As). The rest of the structure is a bit wider, and Jeff noted that the ABX 07 index has been taking some hits.
- Jeff noted that Lehman still has a warehouse line for Resmae, which was bought by Citadel, and that this line is “getting hammered.” They do around \$40-50 million of origination a month (I think subprime). There is \$50 million of collateral against this line – I think that Lehman actually writes the loans and then transfers the risk to Citadel through a TRS because Citadel might not be able to write the actual loan? We might want to follow up on this – it was the first I’d heard of this arrangement.
- Jeff mentioned that CDOs might hit triggers with rating agency downgrades and be forced to turn off the faucets.
- MLEC – No one seemed very excited to talk about this – seems like discussions are being held among a relatively select group. Jeff just noted that there was a good deal of uncertainty around determining “market price.”
- European Residential Mortgages (from the firmwide risk packet). This market has been trading off, and Lehman took a \$37 million charge on the end of September on UK nonconforming positions (in the UK, non-conforming consists of 50/50 subprime and near-prime) – these write-offs were in addition to a \$93 million writedown taken across the Europe book in August. In total, Lehman has \$9 billion of exposure in Europe, primarily through whole loans but also through secondary RMBS bonds and residuals. Most of this is from the UK, with Dutch and Italian mortgages also in the mix. Lehman thinks that this is a liquidity story as fundamentals are still strong, but said that there is concern that the UK nonconforming market could have a US subprime-like deterioration. Again, it’s hard to hedge in this market given the lack of an ABX-comparable index in the UK.

#### Backtesting

- We didn’t really cover backtesting in great detail this month, but there was one equity division exception driven by a big move pre-Fed rate cut, when the desk was short vega.



### Stress Test Report

- Lehman added a new stress, called the Credit Crunch which is essentially Summer 07. Currently, the loss for this scenario is at \$4 billion. In addition to mortgages declining, EMG credit spreads gap, FX carry trades unwind, and demand for energy declines. Again, I'm not really sure what they do with the scenarios, particularly as they continue to add them (now up to 14). I asked Jeff about this, and he said that they wanted a scenario that captured these types of moves, but I'm not sure for what purpose as it's not clear the scenarios generate much internal risk discussion.

**FOR THE MEMO**

### **FINANCIAL RESULTS (ED GRIEB)**

- Ed Grieb is leaving the job of financial controller to take an investor relations position. Martin Kelly is the new controller.
- Net Revenues for the month were at \$2.1bn, a very good month given the performance of the last few months, and Lehman's second highest October ever. Non-US revenues accounted for 44%, driven by Asia as Europe was down, notably credit and securitized products. Non-personnel expenses were \$350m, driven by some costs associated with MCD branch closures. They are estimating the full year's revenues to be \$20bn. This will include a significant gain on an investment in GLG (essentially a reverse IPO where GLG was acquired by an SPV) where their \$35m investment is being valued at about \$500m.
- Lehman took a \$190m gain on the mark-to-market of their own debt as spreads blew out during the last week of October.
- Fixed Income had revenues of \$626m, on par with average month 2007.
  - They took a \$400m gains on leveraged loans, as TXU sold close to par, earning \$200m. No marks were taken on Harman, as Lehman would not have funded it even if the sponsor had not backed out.
  - Securitized products were down \$300m, which includes gains on some hedges against the position. Aurora's production was \$550m last month, and production is shifting towards conforming product. A subprime deal was completed earlier in the week, where the AAA cleared. The collateral consisted of the last of BNC's production, with a projected cum loss of 5% or less. They have \$300m total exposure remaining from this securitization. There were 2 recent UK securitizations, but they did not have the details on these. There was also a Japanese securitization (LStars?) which sold at a premium at 107/108.
  - Commercial real estate was down \$100m due to writedowns on hedges. Lehman still asserts that the quality of the CRE loans is still good, but investors continue to push down the CMBX due to general fears about "mortgages." The Archstone term loan is being retooled to change some of the specifics, such as how amortization schedules are calculated, using lessons learned from levfin, in order to make the deal attractive to investors. A Windermere CMBS is in the process of being marketed. A single property was securitized in Japan (LJac?). In general, Jeff said that BB and below was selling on the securitizations, but the middle pieces have been harder to place. Lehman is over 50% of an upcoming \$3+ billion securitization, LBOBs. The BB and below have sold, but the middle and AAA are still sticking. They have not taken losses on the conduit yet. Fixed rate deals have gotten done, but not floating rate. Cap. rates are rising.

- Equities had a record month at \$859m (compare to avg month 06 at \$325m and avg month 07 at \$542m). The main drivers were the volatility and cash businesses in Asia, volatility in Europe, GTS in India and the US), as well as some private equity.
- Investment Banking was \$316m for the month, slightly below average month 2007. Equity and debt origination was down, but M&A was strong with the TXU and ABN Amro deals.
- Investment Management was \$298 for the month, above average month 2007. AUM was up \$1bn. PIM revenue was flat. Lehman is liquidating one of its money market funds in which they had injected about \$6m of capital in order to prevent it from breaking the buck.
- Cash Capital Excess at LBI was down to \$3.1bn, but they project the number will be \$8bn by the end of the year. Net Leverage was 18.7x, with a target of 16.2x by the end of the year. LBI had net revenues of \$47m, again driven by the split hedges issue.
- The amount of Level 3 positions has been an internal focus this past quarter. The number grew from \$20bn last quarter to \$33bn this quarter. Lehman decided to move the entire book of subprime (\$6bn) and scratch and dent (\$1bn) from Level 2 to Level 3 during the quarter. The alternative would have been to move only certain pieces of the portfolio, but they ultimately decided to move the whole thing.

#### **TREASURY UPDATE (PAOLO TONUCCI)**

- Paolo gave us an update on the current funding markets. He said the issue markets are just not there. Structured notes, which account for 30% of the total portfolio, are still being issued at a rate of \$500m per week. They are looking at the hybrid market (retail and institutional). They would have expected a coupon in the range of 7 to 7 1/8, but Wachovia just issued at 8 and Lehman would have to be higher. Mcaps are pricing at L+400 on the institutional side. In Europe, they could possibly issue a perpetual structure.
- Lehman is looking at a holding company capital ratio ending the year at 10.7 or 10.8. The ratio could be anywhere from 10.5 to 11. They are comfortable with that number given how difficult it is to issue right now. The decrease in commitments helps the ratio.
- The banks have grown \$7-8bn recently. Bankhaus has doubled to \$20bn, while LBB is shrinking, as it was set up to fund mortgages.
- They will be in touch with Matt regarding a capital computation question on index hedges. Basically, both longs and shorts are grossed up on various tranches of index hedges, and they have a netting question.

#### **REGULATORY UPDATE (LAURA VECCHIO, TONY STUCCHIO)**

- FINRA completed its audit of Neuberger (a quick audit since the b-d is basically nothing there). Lehman does plan on taking the capital out of Neuberger and

bringing it back to LBHI. Nothing has come up on the FinOp side, and the CSE exam is going relatively well. They have met with Audit.

- They gave us the usual complaints about OTS. The focus appears to be newspaper article based; that is, whatever is the hot topic of the day. They have finished examining the thrift and now have a holding company focus. The exam closes on December 12.
- The NYRO bd exam continues (“drags on”). They keep requesting documents and Lehman is not sure when it will finish.

### **CREDIT RISK (STEVE SIMONTE, VINCE DIMASSIMO)**

#### Monoline Exposure (Steve Simonte, Julia Nand, Ana Arsov)

- As we requested, Lehman put together a comprehensive look at their exposures to monolines and DPCs. (All numbers below are as of 10/31/07.)
  - ACA
    - Lehman has 4 trades with ACA: CDS on SS tranche of ABS CDO (Corona Borealis) with a \$750m notional, and 3 trades where Lehman purchased protection on SS tranches of TABX (\$420m notional on 40-100%, \$300m notional on 25-100%, and \$225m on 62.5-100%). CE is \$49.8m (net of reserves of \$379m for TABX trades and \$142m for ABS CDO) and MPE is \$506.1m. ISDA includes collateral schedule which has unlimited threshold at current rating level and \$2m at BBB+. They have taken reserves of \$142m for the Corona position and \$379m for the 3 TABX trades.
    - If ACA is downgraded, all 30 of ACA’s counterparties will trigger a CSA. ACA is asking all the counterparties to waive the collateral call while they search for a strategic solution. Morgan Stanley has been enlisted to help run the process of coordinating the counterparties’ responses. So far, the response has been positive to the request. Lehman is in the top 7 of creditors with exposures. Should ACA go under, the process will be governed by insurance insolvency, which may hold up distributing any funds until the last policy has expired (30-40 years!).
    - During the 2<sup>nd</sup> quarter, ACA printed all of their positions. Lehman has one of the worst trades – the CDS with the 25% attachment point. They feel that this may be penetrated in mid 2008. Should Lehman actually need to make a claim against ACA, they would not hesitate to do so as this would put them in a better place in the pecking order above counterparties.
    - Lehman also has exposure from two interest rate swaps which ACA wrapped. The swaps were with nursing homes in California that currently have a standalone BBB rating. Lehman is in talks with the

company to convert their debt to fixed rate and terminate the swaps. They would need to raise \$21m in order to cover the mtm.

- For the rest of the industry, Lehman expects them to be put on negative watch. At that point, they will need to raise capital. Lehman expects Assured, FSA, MBIA, and Ambac to have no trouble raising capital. They expected CFIG to get an infusion from its French parent, which occurred subsequent to our meeting. They think FIGC will need some type of M&A solution. XL is somewhere in the middle.
- MBIA
  - Direct notional exposure of \$753m with MPE \$22m. Indirect wrapped exposure on \$836m of muni bonds with a CE of \$28m. Also have exposure from GICs (Guaranteed Investment Contracts). In a GIC program, the cash from the sale of CDOs are put into these vehicles. The purchaser of the GIC receives interest and the return of the principal at some point. MBIA is providing the GIC, thus there is secondary exposure to them.
- Ambac
  - Direct notional exposure of \$675m with MPE \$47m. Indirect wrapped exposure on \$79m of interest rate swaps. GIC exposure of \$1.6bn with MPE \$378m.
- FSA
  - Direct notional exposure of \$2.7bn with MPE \$14m. Majority of exposure on SS corporate CDO. GIC exposure of \$843m with MPE \$396m.
- XL
  - Direct notional exposure of \$7.3bn with MPE \$192m. Indirect wrapped exposure on \$457m of interest rate swaps.
  - Lehman has taken reserves of \$13.2 on munis and fully reserved a HG ABS deal for \$42.5m.
- Assured
  - Direct notional exposure of \$3.0bn with MPE \$165m.
- FIGC
  - Direct notional exposure of \$846m with MPE \$32m. Indirect wrapped exposure on \$813m of interest rate swaps.
- PRIMUS
  - Direct notional exposure of \$903m with MPE \$12.5m.
- Theta
  - Direct notional exposure of \$675m with MPE \$13m.

### Counterparty Credit Risk (Steve Simonte)

- We quickly talked about counterparty exposure as the monoline discussion ate most of our time. CE was up to \$47bn from \$42bn, while MPE was up to \$132bn from \$121bn. The top investment grade exposures were the usual suspects. On the non-investment grade side, ACA led the list with a gross current exposure of \$421m. Zama, a family holding company, was next with a CE of \$154m from equity derivatives collateral movements and has since been cleaned up. Baupost was next with \$80m of CE from settlement exposure.

### Leveraged Finance (Vince Dimassimo)

- Commitments as of 11/14 were \$12.9 billion, down from \$13.9 billion a month ago. They put on two new commitments – Firth Rixson (\$674m) and Boise Paper (\$411m). Six deals were revised – Arysta LifeScience (↓\$599), Houghton Mifflin (↓\$261), McJunkin (↓\$228), Alliance Data (↓\$95), United Rentals (↑\$8), and A&P (↑\$11). Three deals closed – Metavante (\$400), ARINC (\$365), and Varel (\$160).
- Fundings decreased from \$11.8 bn last month to \$8.5 bn. Details are:
  - Closed deals: Metavante (\$90), ARINC (\$325), and Varel (\$160)
  - Increased fundings: ACTS (\$10), and First Data (\$14)
  - Syndications / Sell-downs: TXU (\$2.6bn), LKQ (\$325), USIS (\$320), CDW (\$235), Syniverse (\$161), Varel (\$160), PHS (\$158), Verture (\$26), and Chevron Benelux (\$12).
  - FX Translation: +\$5
- Going forward:
  - Applebee's/IHOP (\$2.1bn) expected to close Nov 29. This is a whole business securitization. A portion of this debt was originally supposed to be wrapped by Assured, but they are rethinking this.
  - Houghton Mifflin (\$2.1bn) is scheduled to close Nov 21. The date was moved up. For the second lien piece they have found a price and are working on the first lien piece. They expect the pricing to eat into the fees but not fully.
  - United Rentals (\$975m) is scheduled to close Nov 20 but the sponsor may back out.
  - Sequa (\$820m) is scheduled to close Nov 30. Commitments are due Nov 21.
  - TRW/Mando (\$550m) is scheduled to close Nov. 30. This is an addition to an existing facility and Lehman is focusing on syndication with the existing lenders.

### **UPDATE ON EQUITIES TRADING (PAT WHALEN, SANDEEP GARP)**

- Pat Whalen gave us an update on Lehman's equities trading business – he is the head of global equities trading – Gerry Donini runs the US trading business. Pat gave us

the usual spiel on moving not storage, and much of the presentation was a bit of a sales pitch. Pat sees the market as moving towards determining the correlation between equity and other markets, and trading accordingly. He also noted that volatility and variance are becoming traded assets. He expects to see the convergence of long-only asset managers and hedge funds, and things that financing instruments will continue to be in demand. Over the last 3-4 years, the division has been pushed to take more risk, as they were only using 30% of VaR and b/s limits. The business is focusing on new markets as well, defined as Asia and some more EMG (where they are “putting a toe in the water”). He does not plan for prop trading to be more than 15-20% of the business, and sees Lehman as a market maker rather than a prop shop. Pat spoke about Asia, where he sees strong demand. The vol business there, which is an area of focus, tends to have local clients, including HNW customers. He encourages his traders to have (an express, one would assume) an opinion. Pat thinks that China is overheated like Japan in the late 80s, and when he hears people talk about a soft landing thinks “good luck.” He does worry about China and the US crashing together. According to Pat, Lehman is a major player in variance swaps, and is also very active in index options as well as block trades. Pat stated that while he used to spend most of his time on making sure that the traders had the right infrastructure to trade (sounded like a COO role), he now focuses much more time on market risk, and seems to work fairly closely with Sandeep. That said, increasing capacity has been a big area of focus. This conversation was a bit disjointed, but we did get a sense for where Lehman sees its equities trading businesses headed, for now at least.

#### **MARKET RISK (JEFF GOODMAN, MARK WEBER)**

- Risk Appetite fell this month to \$3.3 billion, down from \$4.3 billion the month prior. This reduction came primarily from the equities business (overall delta dropped from \$3.6 billion to \$1.4 billion). Around mid-October, equities RA dropped nearly \$400 million and stayed at the lower levels throughout the rest of the month..
  - Jeff said that there had not been a firmwide risk committee meeting in the past two weeks, and there might not be one the following week either. Do we want to say anything about this? They probably shouldn't advertise it as weekly if they're holding these only one out of four weeks.
- VaR ended the month down as well at \$109.2 million. The reduction driver is the same story – equities. Total firmwide VaR peaked around October 19 at \$160 million, when equity delta was at \$3.6 billion, and bottomed on November 8 at the \$110m level, when the equity delta was down to \$1.4 billion. Much of this reduction came from the US, and was concentrated in volatility flow (There is a nearly \$15 million drop in equities VaR over a few days in mid-October, nearly all of which came out of the US vol flow business). There was also a reduction in equity delta in Asia.
- SPG saw its VaR increase, but this was due to an increase in volatility rather than new positions. Mark pointed out some notable spread increases in indices such as the

CDX IG (47 to 75), CDX HY 362-481, ABX BBB (1623-1924) and ABX AAA (180 – 800).

- Lehman is putting on a USD notional \$935m deal contingent EUR/JPY FX forward. Lehman's risk is that the Yen will weaken and the deal will not complete. Deal completion is put at 90% likelihood, and MPE is \$112m if deal falls through.
- UK housing growth has slowed, and the European residential mortgage space continues to be challenging. As mentioned in previous months, there is no ability to hedge in this market, i.e. no CMBX equivalent. There have been some smaller deals in early October, but not all parts of deals were placed. The secondary market has stabilized somewhat. Lehman thinks this is a liquidity story as most people think European housing fundamentals are still sound, and UK non-conforming mortgages have not a subprime-style meltdown. Jeff noted that some forward sales of AAAs were exposed to big moves in spreads.
- Backtesting: Lehman had two exceptions at the 95% level, and one at the 99% on 10/29, with a loss of approximately \$300 million. This was the day of a Moody's downgrade, and substantial ABX losses (we might want to get more color on this). On 10/31, there was the other 95% loss (around \$100 million), driven by remarking of ABS residuals and a write-down on CRE whole loans (SPG had a \$101 million write-down in total). There were also losses on a long agency positions.

#### **FOR THE MEMO**

- Credit Risk Management has been heavily focused on exposures to financial guarantors, notably ACA. If ACA is downgraded, Credit Support Agreements ("CSAs") signed with all of their approximately 30 counterparties will be triggered and ACA will not be able to fund the resulting collateral calls. ACA has asked all their counterparties to waive the collateral call and Lehman is in negotiations with them on the terms. As of October month-end, Lehman had taken reserves in excess of \$500 million on the mark-to-market of their trades with ACA. Net of these reserves, Lehman has approximately \$50 million in current exposure.



**FINANCIAL RESULTS (MARTIN KELLY)**

- Net revenues were low at \$948m for the month. Fixed income had a loss of \$242. Aside from special items in the quarter, the rest of the division made \$348m. That includes a \$100m gain on India power plants by GTS. There were also seed investment writedowns on Blue Bay (a UK hedge fund investment, not an investment in the management company). Special items for the quarter in Fixed Income included:
  - Gross writedowns of \$2,182m and net writedowns of \$890m within securitized products. Prime (mainly Alt-A) had gross writedowns of \$807m and net writedowns of \$405m. Hedges included \$5bn in TRS of AAA against Lehman's Home Equity Index, an index composed of 900 cash issues of '04, '05' and '06 vintages of short duration (3 years versus 12 year duration for ABX synthetics). Non Prime losses were \$849m gross, \$506m net, with hedges including ABX and single name ABS CDS as well as CMBX. ABS made \$222m on CDO and CDS shorts. CDO Secondary had losses of \$313m gross and gains of \$89m net trading ABS CDO. A macro hedge consisting of ABX positions lost \$78m net as the shorts were taken off too early. Europe lost \$86m gross and \$103m net on duration hedges.
    - As an aside, Aurora had \$450m originations, which was less than what was securitized.
  - Real estate lost \$711m gross and \$543m net for the fourth quarter, but was up \$1bn for the year. Losses came from land positions in California (Suncal) as well as spread widening in November as the peak spread was November 26. Europe was a part of the markdown as there are no vehicles to hedge spread risk in that market. Jeff noted that the two Lehman deals in the market in Europe had only sold 25% at this point.
    - On the Archstone deal, Lehman has reserved the fees for the bridge equity. The term loans have been priced at 99 and still have flex. They are contemplating some asset sales. The performance of the assets (multi-family) is still good and rents are not dropping.
    - As an aside, Jeff mentioned that it's still possible to get financing for long-term fixed rate debt with low leverage in spite of the slow securitization market. Floating rate loans are less liquid but that is probably more a function of the types of properties involved (more "storied" or transitional properties). He also noted that the business is debating whether to use a fixed rate hedge on the floating rate book. To date, the floating rate book has not been headed, is short duration, and considered to be low volatility. As that is no longer the case, hedging decisions need to be made.

- The CDO business including corporates and the primary business lost \$540m gross, \$51m net.
  - Auction rate securities lost \$18m as the trading inventory (mostly muni) was revalued.
  - Munis lost \$91m gross but made \$29m net. Lehman used ABX shorts to hedge, which were put on a couple of months ago.
  - The Contingent Acquisition Facilities made \$334m gross, \$322m net, mainly on gains from TXU of \$200m.
  - Fixed Income's share of credit spread-related P&L for LEH debt was \$320m.
- Equities revenue was \$524m for the quarter. That included a \$495m gain on GLG and a gain on the debt mtm of \$140m. The core businesses in equities lost \$100m on the quarter.
  - Investment Banking was \$347m, with strong advisory and equity origination. Debt origination was down. Investment Management was at \$319, with increasing AUM.
  - December "feels better" so far. Through the Monday of the week of our meeting, net revenues were \$1bn with strong FID and Equity results above the run rate. IB was seasonal, with the preferred issuance for Fannie and Freddie leading to strong revenues. Dec 17<sup>th</sup> was the only negative day with GTS/GPS a leading driver, as they are down \$145m for the month.
  - Commodities made \$300m for the year as they hired a power trader and have entered more markets. They are dealing with some accounting quirks with Eagle as the storage contracts are not mtm but the hedges against the contracts are (same issue at ML).
  - The tax rate for the year was 17.6%, well below average '07 rate of 30.6%, as they were truing up the rate for the year.
  - LBI net revenues hit a record low of \$1.289bn loss. This was again the split hedges story where the prime/nonprime and CDO securities were in the broker and the hedges were outside. LBI excess capital remains at \$2.2bn. There was one exception at 99% and a couple at 95% within the broker.
  - In the 12/10 firmwide risk snapshot, there is a bullet on the IMD Dollar Liquidity Fund – its NAV is under pressure due to its SIV paper (which constitutes 9% of its assets). The rating agencies have requested a formal action plan. Chris O'Meara explained that as long as the NAV is between \$.995 to \$1.005, the fund is still considered to be at \$1 (i.e. the buck has not been broken). Currently, the NAV is at \$.9975, and it can't be AAA below .9975. Lehman is providing up to \$20m in support, which is what the rating agencies wanted.

#### **REGULATORY UPDATE (LAURA VECCHIO, TONY STUCCHIO)**

- FINRA is closing their exam. On the FinOps side, there will be some documentation issues but no recommendations coming out of the CSE exam.

- NYRO expects to close their exam in January.
- OTS has asked (hopefully) their last questions.
- Lehman received IMM and FRB approval from the FSA. This covers Fixed Income, credit derivatives, FX, and financing products.

**CREDIT RISK (STEVE SIMONTE, VINCE DIMASSIMO)**

- From a phone call with Steve Simonte on 12/11 concerning ACA:
  - ACA needs to show they have a viable business model and also deal with the collateral issue in order not to be downgraded by S&P. ACA is basically admitting that their structured finance business is toast, and are trying to reposition themselves as a boutique muni wrapper. Steve feels this is doubtful, but it doesn't hurt to dream and will keep ACA's 25 employees (!) showing up to work.
  - ACA has hired Blackstone to advise with the restructuring and to organize the creditor discussions. They have had several calls with the 30 banks who are creditors. The company is asking for a complete forbearance on the CSAs, ie forget the CSA ever existed. Then, ACA would be sitting with \$1.5bn in treasuries until losses are incurred (which is probably never according to ACA). The downside to this from Lehman's perspective is that, in order to keep the insurance policy alive, they would need to keep paying the premium to ACA, which is sending good money after bad. More likely, the creditors will agree to a one-month temporary forbearance.
  - Interestingly, Steve said that there is big support for forbearance among the commercial banks. He characterized them as very unsophisticated and lacking any real understanding of the products involved. Lehman is insisting on seeing all the confirms for the 54 trades that ACA has, and the CBs are fighting it. Lehman wants to be able to model ACA's exposure. The group has hired a third party advisor to do the modeling, and Steve expects they will hold their hand throughout the modeling process and expressed reservations about their ability to value the more complicated trades. Lehman is on a steering group, composed of 10 of the more sophisticated counterparties. UBS and Merrill (Judy Yip is the contact) are also on the steering group.
  - Update from the monthly meeting: The actual downgrade of ACA had no real impact on Lehman's exposure, beyond the headline risk. The downgrade "lit a fire" under the creditor group to get together to wrap up the forbearance agreement, which they agreed to until Jan. 18. Premiums being paid at this point for the protection are being put into collateral accounts, so in effect Lehman is paying themselves. The timing of the downgrade was the result of pressure that the rating agencies felt to act.
- In other monoline news, MBIA is on the verge of a \$750m capital deal in which Lehman will participate with JPM. The capital will be in the form of surplus notes.

- “A Surplus note is a bond issued by an insurance company. These securities are subordinated obligations, and fall at the very bottom of the operating insurance company's capital structure. They are issued primarily by mutual insurance companies, which are not public and owned instead by their policy holders. Surplus notes are debt-like in that they pay a coupon and have a finite maturity. However, in many cases, state insurance regulators have allowed insurance companies to classify the capital raised via surplus notes as “surplus” (which is the statutory equivalent of equity), because surplus note holders are last in line to make a claim on the company's assets in a default scenario, much like where equity holders reside in a public company. The motivation for mutual companies to issue these instruments was to raise surplus (or equity) in response to new risk-based capital guidelines developed in the early 1990s. Because mutual companies are owned by policyholders, not shareholders, there was no alternative method to raise surplus or equity. While surplus note holders have last claim on the assets of the operating insurance company, it is important to realize that this claim is at the operating company level, which is still ahead of holding company obligations.” Retrieved from "[http://en.wikipedia.org/wiki/Surplus\\_note](http://en.wikipedia.org/wiki/Surplus_note)"
- Counterparty exposure to XL was up to \$300m due to hedges movement. They have reserves on about 10% of that amount. Collectively to the monolines, Lehman has a \$500m VoD.
- Total CE was up to \$48.6bn from \$47.1bn. The CDO exposure is increasing due to market movements, with CEs as follows: Corona Borealis \$885m, Pyxis \$867m, MKP Vela \$774m, and Libra \$701m.
- While IG exposure dominates accounting for 97% of the total CE, Non-IG exposure is increasing due to counterparties gained during the Eagle Energy acquisition. Most of the top Non-IG exposures come from energy counterparties. Most of this exposure is right way risk which gives CRM comfort. [We should schedule a short update from Peter Galbraith about the counterparty credit risk in this area in conjunction with broader update on commodities business.]
- Lehman has exposure to Centro, the Australian company that is a large owner of shopping malls in the U.S. whose stock price has been plunging. Lehman has \$70m in convertible bonds which they have marked to 40. Some have been sold to hedge funds.
- Drake’s Global Macro Fund is down 24% ytd. Lehman and Morgan are prime brokers. The fund is facing up to \$1bn in redemptions at year-end. Drake is trying to convince investors to rescind and will impose gates if necessary. The fund may breach performance-related covenants in their ISDA Master Agreement. Lehman is working with them to provide relief in return for a cross master netting agreement between pb and otc derivatives. Lehman’s exposure: CCE \$0, MPE \$68.
- Lehman has been retained along with ML as M&A advisor to the merger of two large mining companies. They are also working with ML and Santander on the potential

financing of the deal, which has a total transaction size of \$94bn, of which \$49bn would be acquisition debt, split into \$12bn bridge loan and \$37bn in term facilities. The deal is expected to be investment grade. In general there is not an appetite to grow the pipeline of deals, but this deal is considered a “franchise deal.”

- The leveraged financing pipeline is down to \$6.886bn, from \$12.941bn last month. Details are:
  - New Commitments: +\$2.785bn, led by Dana Corp (\$800m, financing to emerge from bankruptcy) and Booz Allen Hamilton (\$765m)
  - Revised commitments: -\$2.485bn, led by PHH (\$1.83) and TRW/Mando (\$550)
  - Closed deals: \$6.355bn, led by Applebees/IHOP (\$2.139), Houghton Mifflin Riverdeep Group (\$2.137), Sequa (\$820), Firth Rixson (\$674), Hawaiian Telecom (\$455)
- The funded amount increased to \$12.437bn from \$8.487bn last month. Details are:
  - Closed deals: +\$4.722 including Applebees/IHOP (\$2.139), Houghton (\$2.001), Hawaiian Telecom (\$302), Sequa (\$280)
  - Increased Fundings: +57
  - Syndications/sell-downs: -\$832 including TXU (\$344), ARINC (\$130), PHS (\$120), Metavante (\$90), Allison Transmission (\$79), Vertrue (\$51), and ACTS (\$18)
- The Applebee’s deal (a whole business securitization) was originally to be wrapped by FGIC, XL, and Assured but given the problems with monolines this proved unmarketable. The final structure included \$675m wrapped by Assured (about one-third what originally was to be wrapped). Lehman had not yet sold any of the bonds. First lien wrapped bonds will be priced at L+220, unwrapped BBBs at L+285 and BB 2<sup>nd</sup> liens at L+440.
- Other deals discussed on the Firmwide Risk pages:
  - Citadel Pre-IPO loan: Lehman is serving as joint lead arranger (with Goldman) on a \$700m 270-day senior secured term loan (Lehman’s share \$350m) to close and fund by 12/31. Citadel is carving out its high frequency trading and options market making business from two of its existing funds and will draw on the facility to repurchase shares from the fund investors who elect cash instead of a pro rata share of the new business.
  - Tyco: Lehman is participating in \$400m of a 364-day bridge facility for Tyco. The bridge, which is not expected to fund, is intended to act as a backstop in the event repayment of a portion of the company’s bonds are accelerated.
  - Maguire Properties: Lehman and LBREP (real estate partners) will submit a non-binding term sheet to provide up to \$1.4bn of debt and preferred equity financing for the privatization of Maguire Properties, a publicly-traded REIT focused on office properties in LA, Orange County, and San Diego.

- MPS Financing: Lehman will backstop €1.727bn of financing to support MPS' acquisition of Banca Antoventa. Lehman's proposal is to backstop a portion of the rights issue not subscribed.
- Netcard/Japanese CF/SME Loan Financing: Lehman has \$189 financing to Netcard, a distressed company. Part of the cashflow from their collateral was wired to the collateral's former owner, and Lehman is engaged in legal proceedings to recover the funds. Lehman has \$1bn in loan exposure to consumer finance and SME lenders in Japan. The market for unsecured CF and SME loans is extremely illiquid due to investor concern over recent bankruptcy rulings.

#### **UPDATE ON SIV/ABCP (SEAN WHO WORKS IN STRUCTURED FINANCE)**

- Since the beginning of the credit crisis, SIV assets have experienced a decline in value which has triggered several waves of rating agency downgrades. NAV represents the residual value of capital notes if the asset portfolio were to be liquidated at current market value. Average NAV went from over 100% in June and July to 80% in July and August, down to 75% in September and October, to 55% in November. Once the NAV of a fund drops below 50%, the SIV goes into enforcement status, where the program goes under the control of a trustee (such as BONY or JPM) who reviews restructuring or liquidation alternatives.
- Four programs are currently in enforcement, the first in the 20-year history of the SIV market. The cash flows from the investments have continued to pay CP holders, leading to lawsuits from longer-term investors who want to preserve cash. The goal is not to liquidate the assets in a fire sale, but rather to do it over time as not to erode the value of the assets further.
- Other potential structural solutions being implemented include:
  - Asset sales: In this depressed market environment, managers are selling more liquid products.
  - Vertical slice trades: Sponsors have encouraged capital note investors to buy back their leveraged share of the SIV's portfolio in exchange for retiring the capital note. Investors get an equal share of the hard assets, not cash. MBIA liquidated its program in this manner.
  - Sponsor-provided liquidity: Sponsors have provided liquidity facilities directly to the vehicle to repay senior debt as it comes due.
  - M-LEC: Diminished need given sponsor-provided liquidity.
- Lehman's risk to the SIV/ABCP sector comes from a variety of exposures:
  - CP/FRNs/MTNs (Lehman Brothers): \$4.1bn notional exposure with a \$0.3m expected loss from Axon. Included in the exposure is \$2bn of ABCP with January 2008 maturity to Clipper & Galleon (State Street

sponsored ABCP conduit) which was accepted in consideration of SS's importance as a funder to the firm.

- CP/FRNs/MTNs (LBAM): \$3.3bn notional, no expected losses. Exposure to a variety of SIVs.
- Liquidity Facilities: \$357m notional, \$15m expected loss to Axon. Axon has fully drawn a liquidity loan (which is senior to CP) of \$50m. The program is in enforcement and the expected loss comes from the current mark of the collateral.
- Repo: \$883m notional, \$0 CE, \$0 expected loss. Exposure is to Whistlejacket. Half of facility is margined daily with a 5% haircut and on the non-margined portion Standard Chartered provides second loss protection directly to Lehman.
- CDS: \$1.4bn notional, \$0 CE, \$0 expected loss. Exposure just to Cairn. This was a restructuring trade in which Barclays agreed to term fund the program with credit protection provided by Lehman. CDS covers default risk on AAA subprime assets with 8% subordination which increases over time.
- Derivatives: \$3.4bn notional, \$28m CE, \$0 expected loss. A variety of swaps with different counterparties.
- Other related exposures: Lehman finances \$2.5bn of a variety of assets in Hudson Castle, Liberty Hampshire, and BSN conduits.

## **MARKET RISK (JEFF GOODMAN, MARK WEBER)**

- Risk Appetite usage increased slightly this month, ending at \$3.7 billion (up from \$3.4 billion last month). This was driven in part by FID increasing its net rate exposure, ending the month at \$9 million/bp (versus \$2.8 million/bp last month). Equities delta was up slightly at \$1.7 billion, versus \$1.4 billion last month. Throughout the month, it tended to be in the \$1 - \$2 billion range. Equities is running at its RA limit, with a usage of \$802 billion versus a limit of \$800 billion.
- VaR ended the month up at \$134 million, versus \$109 million last month. FID was relatively unchanged, ending at \$91 million versus \$88 million last month. Equities had a bigger increase, ending at \$28 million versus \$19 million last month. It looks like much of this increase came from volatility flow (\$19 million versus \$8.5 million), which had been much of the driver of the decrease two months ago. Mark didn't single out the desk this time, but we can follow up next month.
  - Commodities VaR has been on the rise lately, ending the month at \$11.5 million (down from the prior month, which ended at \$13.2 million). We'll look at the increased risk taking as part of our upcoming discussion about the business overall and its growth plans.
- CMBS update –12/3 risk briefing. In total, Lehman has \$31.5b in this category – including \$13.4b in floating rating loans, \$1.4b in fixed, \$7.3b in sbu-debt (both

floating and fixed), and \$9.4b of CMBS, of which 70% is AAA. By region, the US holds \$16b, Europe has \$12b, and Asia has \$3.4b. The US fixed rate and CMBS portion are about 98% hedged. There are no effective credit spread hedges for US, European, and Japanese floating rate risk. US (most spread widening) and European markets (no issuance since August) remained closed for securitization, with Asia being the notable exception. Lehman managed to sell off almost all of a \$900m LJAC securitization in Japan.

- Fund derivatives exposure update – 12/3 risk briefing. For multi-manager fund derivatives, Lehman has \$10.7b invested in FoF shares. The 99.5% gap risk is at \$132 million, versus a \$200m limit. This is up \$56m from June due to NAV decreases in underlying trades, and also due to some additional trades. Over the past 12 months, average gap risk was \$111m. In terms of sensitivity, this measure increases \$24m with every 1% reduction in NAVs. For single-manager fund derivatives, there are 14 deals with \$1.05b of jump-to-zero risk against \$2.4b of NAV. Largest exposures are to Galleon (\$343m), Bluebay (\$208m, the same fund on which Lehman has taken a loss as a direct investor, see note above), SAC (\$82m on a \$200m commitment), and DE Shaw (\$98m).
- Woori Finance Block Trade – 12/17 risk briefing. The Korea Deposit Insurance Corp (KDIC) is selling 7% of its stake in Woori, about \$1.1b, as part of a privatization plan. Lehman is bidding on this with a discount of 2.45% and fees of 0%. Lehman expects that others might bid a discount of 0%. Any upside from the backstop commitment goes to KDIC, not Lehman. As one can see, this does not look like a great deal, and Jeff said that this trade would be purely a relationship one, to get in front of the Korean government. The transaction would most likely price in March 2009. The outlook for Woori is not stellar, due to falling net interest margins.
- EMG exposure – 12/17 briefing. There has been some widening in EMG spreads, but nowhere near historical moves, and good liquidity remains. If you look at big moves (as in 5 stdevs) across credit spreads, rates, and equities, EM countries would post losses of \$280 million. Significant losses come from India, Brazil, Argentina, UAE, and Russia.
- Munis – 12/17 briefing Munis have again underperformed treasuries during November's flight to quality, and muni spreads have widened as well. The main risk of Lehman's muni desk is from being long the muni basis and long spread risk, and the desk is also long \$10.7b notional via CDS. If spreads were to widen 10% in munis, taxable bonds, and CDS, the desk would lose \$19 million. With respect to the basis position, a 1% move in the ratio would generate a loss of \$11.5million. A 3% move (2 stdev) would generate a loss of \$34.6 million. Lehman, like Goldman, is also moving to proactively restructure some auction rate securities, often into variable rate notes which have a backup liquidity provider. However, their concerns are not reputational as much as an attempt to mitigate a potential loss in swaps contracts where Lehman would be forced to pay the higher reset, or failed, rate. BONY is providing the back-up liquidity facility for the restructuring, to the tune of \$800m (\$300m of that has already been used). The remaining should be converted in Q1 2008.



- Stress tests – We were given the results from October 31, which are not particularly informative at this point. However, overall losses are down significantly from this summer, when losses approached the RA limit. The worse loss, at \$4 billion, is the credit crunch (the newest scenario), and the next is the EMG crisis at \$2.8 billion, which is followed by HY/LBO/Default Risk at \$2.6 billion.
- Backtesting – There were three exceptions at the 95% level, on November 19, 20, and 26. These were primarily driven by markdowns in SPG, detailed above in the P&L discussion. IR products, CDO, Real Estate, Munis, GTS, and Equities global also had exceptions.

#### **FOR THE MEMO**

- Globally, commercial real estate loans held for securitization, B-Notes/Mezzanine loans, and CMBS total \$31.5 billion at Lehman. The U.S. fixed rate loan and CMBS inventory, which totals about \$5 billion, is 98% hedged. However, there are no effective credit spread hedges for U.S., European, and Japanese floating rate commercial exposures, leaving Lehman exposed to credit widening. Market risk management remains very focused on the management of this pipeline.
- Risk managers highlighted the global Emerging Markets trading exposure to senior management in mid-December due to spread widening in the sector in November. By historic standards, however, spreads are still low. Lehman's exposure to large, correlated market shocks was estimated around \$300 million, with concentrated exposure in India and Brazil. We will continue to monitor this risk.

## **LEHMAN MONTHLY RISK MEETING (MEETING HELD 8/11/08)**

### **FINANCIAL OVERVIEW (Martin Kelly, Gerry Riley)**

Net revenues for the month are (\$670m), which generates a pre-tax loss of (\$1.548b), and an after-tax loss of (\$1,084b). The real driver is FID, with writedowns in resi and commercial. Resi net writedowns were \$2.1b, and commercial was \$400m. The net writedowns are essentially the gross, as there are no big hedges left.

Within that resi \$2.1b, \$300m was from Alt-A loan, \$200m was from AAA Alt-A, \$600m was subordinated AAA bonds, and \$300m was residuals (so in total, \$1.4b in the Alt-A space). Another \$200m was 2<sup>nd</sup> lien loans, and \$300m was UK securities. As far as balance sheet reduction, from the \$24.9b at the end of Q2, Lehman is now at \$21.1b, a combination of writedowns and sales. Doing some rough math, I'd say the majority of that reduction is writedowns rather than sales. They hope to be below \$15b by quarter end. Gerry noted that everything below AAA in the Alt-A securities space is now marked around 20-22.

As for commercial, the overall reduction is still around \$3b. They internally say that they have \$46b left in terms of real estate "at risk", a number which does not have the accounting gross-up but includes GREG and PE interests (and Archstone and Hilton, which are not part of the RE disclosure). They hope to be down to \$43b by quarter end. That \$46b is not a publicly disclosed number, but is how they internally measure CRE exposure. Jeff noted that some of the writedowns are from NY condo developments, one of which they might foreclose on.

Turning to trading businesses, sales credits are down 10% across all businesses. Equities were at \$235m, of which \$230m were generated by the US. They continue to get hurt by KSK, the India power plant (a prop position held by GTS) and on some KSK hedges when the hedges rallied. GTS was also hit on a GMAC position. In the US, liquid markets and equity strategies were strong, while converts were weak across the board. In Europe, quantitative strategies lost \$25m on a mean version trade where they were long energy and short financials. In Asia, vol, converts, and equity strategies all had a bad month. In FID, Global rates, HG credit, and commodities all did well.

Banking was at \$250m, with M&A down despite a big Staples deal closing (\$16m in fees). Underwriting was down. The pipeline is at \$575m, up from June. IMD made \$245m. Asset management and private equity fees were down slightly, and AUM were down (by \$5b) as well, and are at \$281b. There was little income from the minority stakes.

### **CREDIT RISK (Vince DiMassimo, Steve Simonte, Kevin Chichester)**

#### Leveraged Finance

- Unfunded commitments declined from \$940m as of 7/15 to \$579m as of 8/7/08. Drivers included:

- New Commitments: Sunguard Data Systems (\$100m) was the only new leveraged loan commitment during the month. LB is serving as advisor to Sunguard on the acquisition of a French company and the \$100m represents 10% of the financing commitment. GS is the lead underwriter of the loan. The commitment is at current market terms and Kevin noted that Sunguard's debt (currently between \$6-7 billion from the 2006 LBO transaction I believe) has held up relatively well in the market compared to other LBOs. They expect the deal to close around October. The facility is made up of a term loan (BB-) and bridge to bond (B-).
- Closed Deals: The Booz Allen transaction (\$453) closed during the month and was fully distributed at "full fees". While the entire amount was shown as being syndicated on the leveraged debt report, Kevin said that he thought they may have kept \$10-15m for relationship purposes.
- Funded commitments fell from \$3.672bn as of 7/15 to \$2.953bn as of 8/7/08. Drivers included:
  - The Booz Allen deal was a net increase of zero since closed and fully syndicated during the month.
  - The largest changes include:
    - Applebee's/IHOP (-\$159m).
    - First Data Corp (-\$107m)
    - CDW Corp (-\$118m),
    - Other large sales include Home Depot Supply (-\$93m), and TXU (-\$69m). FX changes were -\$21m.
  - Kevin stated that most of the sales this month were cash sales and at or near the current marks. The only significant divergence in sales price vs. the previous mark was the Endemol Holdings position sold back in June. The difference in the previous mark and ultimate realized loss on that position was largely due to not having a good comparables for the exposure. All the positions sold this month were deals that Lehman has continued to sell month after month and thus the marking methodology for these are of higher quality.

#### Counterparty Credit Exposure

- Total CCE across the firm decreased by \$6.3bn to \$48.1bn. Exposures decreased across derivatives and financing.
  - The biggest decrease came in the Energy sector as commodity prices (particularly oil and natural gas) decreased significantly. This resulted in massive decreases in exposures to the firm's energy producing counterparties. *(See significant exposure decreases below for the biggest decreases in the energy sector).*
  - The stock loan/borrow CCE decreased as there was a rolling off of secured lending activity- down almost \$2 billion.

- Lehman's non-IG exposure decreased from 7% to 5% of total firm CCE over the month, largely the result of the decrease in the energy sector.
- Significant exposure changes include:
  - Regarding the top 10 CCE exposures, Italy remains at the top (although at decreased levels from the month before \$2.8bn vs. \$3.4bn. The TXU exposure, which jumped into the top 10 exposures the previous month due to the run up in commodities prices (nat gas) fell off the top-10 as nat gas prices decreased substantially. Most of the remaining top-10 exposures are to SPVs, which bucked the trend and actually increased in exposure this month. Of course, most of these exposures are related to protection bought on ABS CDOs from monolines or from SPVs where the monolines are GIC providers. (*See monoline section below for more details.*)
  - On the weekly liquidity call (Wednesday following the monthly risk meeting), Robert said that the firm may try to novate some of its Sovereign risk (e.g. Italy derivative trades) to Bankhaus. If they are able to do this, it will insulate Holdings from further potential liquidity drains as the opposite side of these trades (i.e. the market risk hedges) are to financial counterparties that MTM daily.
  - Most of the top 10 energy exposures decreased dramatically over the month.
    - TXU's CCE decreased from \$479m to \$158m
    - Chesapeake Energy Corp CCE decreased from \$407m to \$104m. We also asked if the negotiations to get a first lien on PPE had been completed. Vince said they are still working on this.
    - Linn Energy CCE decreased from \$305m to \$187m.
    - While energy producer exposures decreased dramatically on the fall in oil and gas prices, some energy consumers (e.g. airlines) exposures increased as previous payables turned to receivables (e.g. Continental Airlines jumped into the top 10 energy MPE with \$46m CCE and \$115m MPE).
- Steve said that July may be the worst month in the last 6-7 years (this following a horrendous June). He said that was largely due to the equity markets but that the short financials long commodities trade didn't help hedge funds either.

Steve reiterated what he said last month with respect to hedge funds as a sector not seeing a contraction since the early 1990s. September may be an interesting time to watch redemptions this time around to see if money is redistributed within the category or if the sector does in fact contract.

With all the poor performance, they didn't have any problems with hedge funds (and really didn't see a lot of hedge fund blow ups in the market either).

- During the month, one hedge fund group focused on the energy sector lost > \$1 billion. Lehman has a \$100m MPE to the firm driven by the calls and put-spreads it sold to the client on oil and natural gas. This counterparty (TBP) has met all margin calls and has reduced positions but remains exposed to further price declines.

- Monolines:

As of the end of July, Lehman had a CCE, net of reserves, of \$836m to monolines. The largest exposures are to: (1) Assured (\$365m); (2) X/L (\$254m); (3) FSA (\$105m); and (4) Ambac \$59m.

The firm also has \$613m (on a VoD0 value) of hedges against these exposures for a net \$223m (VoD0) exposure to monolines down from \$357m in June. The decrease was the result of increased VoD0 value of the CDS trades referencing monolines.

- ACA- the monoline finally reached a settlement with its counterparties. ACA made a cash payment (1% recovery value) to its counterparties and turned over 95% of residual interest in the entity to its counterparties in exchange for terminating \$65bn worth of CDS contracts.
  - Lehman received \$12m or 1% of its claims which was in line with prior reserve calculations.
- CIFG/ FGIC/ X/L- these three monolines have been and continue to be in discussions with counterparties to tear up trades in exchange for partial cash payments. Some of these discussions are bi-lateral and some are multi-lateral efforts. They discussed the M/L deal with X/L to rip up trades and the the Citi deal with Ambac. In both of those bi-lateral deals, the pay out was less than the reserves booked against the exposures.
  - X/L- they discussed the bilateral deal with ML as phase 1 of a broader effort which allowed them to buy some time to arrange a multilateral agreement with its 17 counterparties.

While Lehman has one of its biggest exposures to X/L (\$591m gross CCE; \$254m net of reserves, which are 67%; and \$68m net of reserves and hedges) it is not involved in any bilateral discussions with monolines. That said, I believe they are included with the other counterparties in multilateral discussions with X/L and CIFG. They said that FGIC are still just pursuing bi-lateral discussions with counterparties. Lehman's exposure to both CIFG and FGIC are not material.

- Bluepoint RE, which popped up on Lehman's top-10 NIG MPE list, is looking to get an out-of-court settlement. On the Thursday before our meeting, Bluepoint filed a "winding up petition" in Bermuda and the regulator has appointed a liquidator. This may provide a test of the insolvency proceedings. Lehman expects the recovery to be around 20%- which is reflected in their current reserves.
  - LB is a small counterparty to Bluepoint with \$46m CCE and \$12m net of reserves.

### High Grade

- The Allstate deal discussed last month appears to be highly unlikely now as the seller is increasingly less likely to go forward with the transaction.
- The one new high grade financing that appears to be going forward is the \$2.5 billion financing of CVS' acquisition of Longs Drug Stores. LB has 50% or \$1.25bn of the commitment. (Lehman did not give the names – this was "Project Laguna", but based on press coverage we're fairly certain this is the deal to which they referred).

### **MARKET RISK (Mark Weber, Jeff Goodman)**

- Risk was essentially flat over the past month, with some changes in diversification. Most businesses stayed close to home in terms of risk taking, and the net equity delta was hovered in the \$1b range (or lower). The rates IR01 tended to be around \$2m/bp in either direction. In terms of major changes, rates went from flat to \$2m/bp short, credit stayed flat, equities were mostly flat (\$700m delta), and firm equity delta was relatively flat, holding in the \$3.2b to \$3.4b range. The public equity delta exposure increased when KSK went from a PE to public position on July 13, which added \$500m (this hits the firm equity delta number).
- Risk appetite usage was basically unchanged (up \$31m) at \$3.4b. There were line-item increases, such as commodities (up \$60m), HY (up \$100m), and SPG (up \$300m). These were offset in part by equity vol flow (down \$125m) and the equity division (down \$70m overall). Firmwide VaR ended at \$104.0m, essentially unchanged from last month's \$103.9m. FID was at \$99.1m versus \$103.2m last month, while Equity was at \$15.7m (versus \$19.1m last month).
- In the FX space, the desk went short Euros and long Yen. They were bullish on the \$/Euro, and scaled back this position as it went their way.
- We walked through the new "Weekly Risk Management Highlights Memo," which replaces the Firmwide risk snapshot. This is written by the risk managers, and is not vetted with the business. This is not widely distributed on the business side – only to the divisional level. It consists of a "Highlights" section which is predominantly general market color, then "Fixed Income Division" which walks through the products (SPG, Real estate, Rates, FX, HG Credit, HY Credit, CDOs, Munis, ARS, Commodities), "Equity Division," "Principal Investing," "Credit Risk," and "Sovereign Risk Management." There is also a more quantitative snapshot that goes

with it, which has risk appetite at a fairly high-level background, as well as aggregated risk exposures such as IR 01, equity delta, etc. Jeff pointed out that these are not useful as P&L predictors, as the aggregation does not account for various factors (such as liquidity). There is a section on counterparty credit risk and stress test results, and also on 10Q disclosure items and changes within. On the second page of this are major market indices and indicators.

- For SPG, the bullets focused on reductions in the resi mortgage portfolio.
- For real estate, the focus was on spread widening and potential sales and accompanying financing. There was also note of balance sheet reduction due to paydowns on European properties, and a partial syndication of one mezz loan.
- Rates talked about the Fannie/Freddie sub debt position that generated losses and was discussed last month, as well as Asian rate risk (mostly in Japan).
- FX focused on risk in the Turkish Lira position, which is apparently something that Kashiuk et al are focusing on.
- HG Credit was focused on the autos, and the desk was long \$825m of LEH bonds.
- CDOs discussed supersenior CLOs, which are apparently still ok.
- ARS talked about recent buybacks – Lehman’s exposure in ARS stands at \$3b. They are looking at customer positions in response to all the recent settlements.
- Jeff characterized a debate around the European Carbon business, which has commitments to purchase about 10MM tones from three Chinese projects. They are trying to decide “how much do you hedge,” much like with deal-contingent swaps. There are unusual risks in this (e.g. UN hurdles), and Lehman is going to establish a formal investment committee process around these types of transactions.
- Equities – risk is low, syndicate desk is reducing block trades, and losses in momentum trades mentioned previously.
- Principal investing – challenging market conditions (KSK, GMAC).
- Credit Risk – monolines, energy hedge fund lost (T. Boone Pickens), and Deal-contingent F/X trade. Credit risk also noted that Munich Re has ceased trading with Lehman because their exposure has risen to \$385m due to purchased puts. Credit pay post 25% of the MTM in return for an agreement from Munich Re that they would resume trading.
- Sovereign Risk – Russia/Georgia, South Africa, and Pakistan. Biggest exposures are in Russia (country stress shows a \$90m loss, driven by being long in credit products and long \$300m of the RUB), followed by South Africa (\$70m, driven mostly by FX).

### For the Memo

- Lehman debuted its new weekly risk reporting snapshot used to brief senior management. It provides a much more detailed breakdown of trading positions and principal investments than prior versions, and also has sections focusing on counterparty credit and sovereign risk. We will continue to discuss the evolving firmwide risk management framework as the newer senior managers refine the process.
- In a reversal from the prior month, Lehman's current credit exposure to non-investment grade counterparties has decreased substantially over the past month from a recent high in June, driven predominantly by a decrease in exposures to energy producing corporate counterparties as oil and natural gas prices plunged in July. However, with respect to hedge fund counterparty credit risk, Lehman has one energy hedge fund group counterparty that lost more than \$1 billion in July on long positions in oil and natural gas. While this hedge fund group has continued to meet all margin calls and decrease positions, they are still exposed to further declines in oil and natural gas prices. Lehman's potential exposure to this hedge fund group currently stands at approximately \$100 million. We will continue to monitor this exposure.



## FINANCIAL RESULTS (MARTIN KELLY)

- Lehman had a solid December, with monthly revenues of \$1.5 billion, in line with average month 2007.
  - FID had revenues of \$650, a good month. HY saw good customer flow in index and cash trading, HG also did well, and liquid markets/rates made \$170 million. Origination was light, and RE was negative (\$22m). There were no CMBS or principal transactions during the month.
  - Principal investments were down \$40 million, and had continued that trend into January (down another \$150m at the time of our meeting). GTS was feeling much of the pain due to concentrated positions in GMAC, etc.
  - Equities were weaker at \$274m. Cash made \$243m and vol trading made \$128m. This was offset by weak PE returns (down \$51m) due to an MLP fund that is 100% owned by Lehman. Equity strategies was also down \$9 million.
  - Investment banking was consistent with the 2007 monthly run rate. Advisory was trending down, but underwriting fees were compensating (Fannie's fees came through in December). The pipeline was essentially flat (down 3%).
  - Europe was down slightly, offset by Asia. Overall, revenues tilted back towards the US.
  - As Lehman's spreads came in, they had a \$80m loss on their structured notes. That said, they had gained \$420 MTD in January as their spreads widened significantly. We asked Martin Kelly if he viewed this as real economic profit, and he said that he did not at this point. He also noted that you could choose not to elect fair value treatment for new issuances, but that existing issuances could not be changed and therefore would continue to affect P&L volatility. Also, apparently it's not so easy to elect out of fair value because then you are subject to hedge accounting issues (FAS 133?).
- January MTD revenues were decent at \$855 (with principal investments being the one area struggling, as mentioned above), and so far the month had only up days.
- LBI had a pre-tax loss of \$300 million, due to subprime and CDO write-downs, without a big offset in an affiliate (such as LBSF). Tony noted that this was unprecedented in his experience. They spoke with FINRA, and are considering doing a TRS with an affiliate to bring the economics of some of the hedges into the b-d. They may start with a small portfolio – the danger is the day to day exposure as any unsecured receivable would receive a 100% charge. The position must be marked and collateralized daily. Tony also mentioned that LBI had a tax receivable, and they

got money in from the holding company “early” on this. Excess capital in the b-d is still at \$2.5 billion.

- The balance sheet experienced significant growth in December, with gross assets ballooning to \$851b from \$691b the month prior. Net assets grew by nearly \$100b, from \$373b to \$472b. We were told that much of the growth was due to customer facilitation and resulted in increased matched book financing. In addition, the mortgage desk put on another roll trade to the tune of \$25b. Martin said that the balance sheet would be down again by the end of Q1.
- On the treasury front, the cash capital excess fell from \$8b at the end of November to \$2.3b in December. Tony and Martin noted that they had wanted this to be high in November for disclosure purposes. On December 16, Lehman issued 1.5b in 10y notes at 260, or L + 195. On December 18, they issued 4b of 5y notes at 275, or L + 210. They wanted to go before January earnings announcements. Martin spoke about a zero cost collar that Lehman put on which was effectively writing a put on their stock. Basically, this generated \$150m in income to offset the cost of the buyback program, and meant that Lehman was taking a view on its stock and flooring the cost of the buybacks. They took a \$150m capital reduction as a result of this trade.
- Investment management update: Two Liberty View funds are being wound down, both of which invested in mortgages. The first, Asset Advantage, is down 47%. All outside investors have now redeemed, and the November 30 mid-market NAV was used (Lehman considered this to be a decision favorable to the investors, although they certainly took a hit on this investment regardless). The other fund, the Income Fund, is down 39%. Bear Stearns is the prime broker for both of these funds and has indicated a willingness to keep financing the assets, but Lehman has been providing more repo financing to both funds.

#### **REGULATORY UPDATE (LAURA VECCHIO, TONY STUCCHIO)**

- OTS had their exit exam, and Lehman was given an above average score at the holding company. At the exit interview, OTS said that “as your consolidated supervisor, we will require ongoing h/c regulation.” Ron Marcus is their liason, and he wants monthly meetings and to receive everything that they send to us.
- NYRO closed their subprime exam with a 15 minute phone call and no material findings. There were three issues that they had, mostly policy nuances.
- FINRA requested a report with all private label securities in the broker-dealer by cusip, in order to determine how positions are being marked. Jeff Goodman said that this would generate a report of over 40,000 lines that would take a significant amount of effort to compile and provide relatively little insight into marking conventions. This request was made by Frank Cesar, apparently at the behest of Mohit. Michelle has been working with Yolanda, and it would appear that this request will not move forward.

- FINRA has taken the view that the HD Supply loan is a “non-marketable” security, and the resulting agreement is the Lehman will take the position out of the broker-dealer, or “out of regulation” as Tony put it. It is currently being funded through tri-party repo (Lehman gets \$250m against the \$1b position), so they are looking for alternative ways of arranging financing before moving it out of the b-d. This seems to be fine with FINRA, as long as it leaves the b-d at some point.

**CREDIT RISK (STEVE SIMONTE, VINCE DIMASSIMO)**

Counterparty Credit Risk

- Monolines remain the largest credit concern. Lehman estimates they would lose \$439m if all monolines defaulted. The following table shows the Value on Default (VoD) of each monoline. VoD assumes zero recovery and incorporates both counterparty and contingent risk (wrapped versus unwrapped spreads, GIC exposures) to monolines.

Monoline	VoD0	Primary Risk	Credit View
Ambac	\$(191)mm	Uncollateralized GICs, CDS on SS ABS CDO, Wrapped Auction Rates/ABS	Neutral credit view. S&P negative outlook rating. Reinsured \$29bn of exposure with Assured.
Assured	\$(165)mm	AAA ABX & CDS on senior CLOs, Wrapped \$675mm Applebees	No credit concerns. More conservative portfolio than peers. Focused on growing muni business.
MBIA	\$(72)mm	Uncollateralized GICs, Wrapped Auction Rates/ABS	Neutral credit view. CDOs largely high grade ABS and corporate collateral. Raising \$2bn new capital to retain AAA.
ACA	\$(39)mm	Wrap of SS of Mezz ABS CDO (Corona), CDS trades on TABX (\$777mm gross MTM)	Insolvent. Downgraded to CCC by S&P on 12/19. Claims and stress losses far in excess of approx. \$425mm in statutory capital.
FSA	\$(27)mm	MMP Contingent Capital, wrapped municipals	No credit concerns. Strong business franchise. Strong parent in Dexia More conservative portfolio than peers
FGIC	\$14mm	Wrapped Auction Rates/ABS, CDS on AAA UK non-conforming RMBS, offset by FGIC CDS protection	High level of credit concern. Negative credit watch by all three agencies. No defined plan to raise capital. Downgrade to AA likely.
XL	\$41mm	CDS on SS CDS on High Grade ABS CDO (Ceago), CDS on Munis, offset by XL CDS protection and reserves	High level of credit concern. Negative outlook by all three agencies. Needs to raise \$2bn. Parent XL Capital may provide capital. No mezz ABS CDOs in portfolio. Downgrade to AA likely.

- Our meeting was the day before the expiration of ACA’s one-month forbearance, and ACA's advisors are trying to get another one-month forbearance in place under essentially the same terms (the difference being creditors would not pay any premium whereas they are now paying premium to themselves). If it did not get a forbearance it would go into receivership. The problem if it goes into receivership is the muni business. Some of these contracts go out 30+ years, and they may have to wait for them to expire before getting any proceeds of the liquidation. There is an attempt out there to get that piece of the business sold or reinsured, leaving just the structured credit mess with ACA. ACA's management had proposed doing an equity swap with creditors to keep it afloat. Steve said there was absolutely no support for this

among any of the major players. The corporate CDO book has been basically flat until recently. Now some of these trades have moved otm to ACA. Thus more of the 29 creditors have skin in the game, complicating the negotiations. Only 12 of the 29 had ABS CDO exposure.

- CE fell from \$48.6bn to \$45.3bn. A contributor to the decline was the fact that banks generally decrease the amount of repo financing they do at year-end. MPE fell from \$132.3 to \$120.0.
- In the hedge fund space, 2007 was characterized as the year of extremes. Two funds produced returns in excess of 1,000%, while many were down double digits. Steve called it very Darwinian, as money flows from poor-performing funds to those that are performing well. Many firms have suspended redemptions, for one of two reasons. First, they may have the inability to generate cash (i.e., the nuclear option). Funds in this situation generally have an orderly unwind of their position, and funds must be very careful about treating investors that are leaving and those that are staying equally. The second reason for suspended redemptions is an inability to get a fair valuation price for their assets. So far, there has been no credit exposure story with hedge funds given recent market events.
  - Lehman has approximately \$1bn posted with Peloton, the largest amount they have posted to any counterparty. They are well aware of this exposure and any “snap-back” risk.
- The CDOs remain among the top counterparty credit exposures: Corona (CE \$897m), Pyxis (CE \$879m), MKP Vela (CE \$761m), and Libra (\$693m). Lehman still believes these vehicles are money good, even though CIBC owns the Class A1 VFNs (the top of the capital structure), which funds only if needed to cover losses.

#### Leveraged Finance

- Commitments were down to \$5.3bn from \$6.9bn last month. The only new commitment is for \$136m for the acquisition of Grand Circle (unlimited flex for both structure and price, and covenants), an operator of river cruise companies. As one risk manager said “It’s quiet out there.” The buyer market has shrunk with the disappearance of CLOs, but larger institutional buyers are still there. Second liens have sold well to hedge funds who like the yield.
  - Revised commitments included United Rentals (-\$975m), Abbott Group (-\$418m), Captive Plastics (-\$380m, as other banks came into the syndicate), and Arysta LifeScience (+\$15m).
- Funded commitments were down to \$10.9bn from \$12.4bn last month. The increased fundings, totaling \$33m, related to FX changes. Major reductions included Houghton Mifflin Riverdeep (-\$616m) as Lehman was able to sell the second liens as well as some of the first liens. TXU reduced by \$309m.

- The syndication for CDW launched the week before our meeting. Lehman is attempting to syndicate a \$600m first lien term loan, and they also hold a \$600m bridge which they are not marketing at this time. They have been able to sell \$80m, and the deal is having a difficult time in the market. Lehman asked 96, and market feedback is telling them the right price is between 92 and 94. The positions are marked at 93.5. We will follow up on this next month.
- As discussed last month, Lehman is providing Dana with an \$800m term loan which is effectively exit financing. Commitments are due next week and they are seeing a fair amount of investor interest. They have priced the loan at 97.
- Syndication closed for four funded deals totaling \$541m and the positions were moved to the trading book.
- Within the High Grade space, there are still deals going on and syndication continues. Spreads have widened out but are still double digits. Lehman is still involved in the potential mining acquisition financing. Lehman has indicated that they will provide up to \$7bn in financing, with the other partners (Santander, Merrill, HSBC, others) committing between \$8bn - \$15bn each.

#### **MARKET RISK (JEFF GOODMAN, MARK WEBER)**

- Risk Appetite usage was basically unchanged this month at \$3.7 billion. There was not much in the way of major change, although FID's RA usage was up slightly and equity's was down. Mark and Jeff noted that the trading was fairly range bound throughout the month, and overall firm RA was between \$3.5b and \$3.8b. Contributing to the movements were IR products, HY trading, real estate, securitized products, and equity vol flow, but none stood out as the single driver. Of that group. Vol flow cut back on their risk while the others increased.
- VaR ended the month up at \$144 million, up from \$134 million last month. FID drove much of that increase, ending at \$117m versus \$91m. Equities declined, ending at \$17m versus \$28 million, with much of that decrease coming from volatility flow. It looks like much of this increase came from volatility flow (\$3.9m versus \$19.2m prior – this desk has driven the divisional VaR for the past three months).
  - Securitized products VaR increased from \$42.3m to \$50.2m. Jeff noted that the cash home equity time series had been flat, and someone updated it by 600bps in one day causing a spike in VaR. The desk has been told to update on a more frequent basis to avoid this sort of outcome.
- Within FID, the division is now long \$4m/bp, as opposed to \$10m/bp a month ago. IR products, HY, SPG, and vol flow are all shorter rates.
- Limits: The firmwide RA limit was increased to \$4 billion, and made retroactive to December 1. The firmwide VaR limit has been increased to \$150 million from \$135

million, but the divisional VaR limits have not changed. This reflects less diversification between FID and equities and increasing correlation in the markets. Managing the overall risk is still difficult as the illiquid stuff is using the most risk capacity and constraining the more flexible areas such as equities and rates (which is not necessarily a good thing, particularly in rates where the positions tend to provide hedges at the firmwide level).

- Risk management will be establishing a limit for principal investments – they are currently trying to figure out whose positions are whose between IMD and principal investing prior to setting the limit.
- CMBS update – in November 2007, CRE met with the Executive Committee and said that they could reduce the balance sheet by \$15b by March 31. All parties now realize that isn't going to happen. Between November and January, the b/s was reduced by \$3.2b, from \$58.8b to \$55.6b. (\$1.8 in the US, \$1.6 in Europe, and up \$.1 in Asia, where there is still liquidity and a functioning securitization market). Lehman's top 20 positions contribute \$20b, with Archstone at \$5b. The new target is to have \$5-6b of reductions by May. Recent real-estate writedowns include \$130m on Suncal (they are redoing this deal and coming up with a PV using new assumptions). There were no deals in December. Jeff noted that since there are no more SIVs, who liked the AA paper, the CRE business has to go find their old lenders and "re-educate" them. Isolated deals (e.g. condo conversions) are having some fundamental difficulties. Hilton is currently in syndication, and the lower portions are out in the market. Back to Archstone, the buyer is still working on asset sales. Growth predictions are now 5%, versus 6% before. The term loan is not currently in syndication. There is mention of starting up a CMBX in Europe, but Jeff thinks that there is less than a 50/50 chance of this happening.
- Residential – Spreads are still widening, trading is still very limited (if it occurs at all). That said, Lehman did 2 subprime deals in January - \$515m of BNC collateral where Lehman sold over 50%, and a \$1.2b SASCO deal where Lehman sold about 40%. These were new loans originated at market terms, and the deals had significant amounts of credit enhancement in order to get the ratings. There has been nothing in Europe since November (75-100% of the November deals that did go to market are still on Lehman's books). November originations were \$450m, while December was \$500m. Aurora will still continue to service loans even though it is no longer originating.
- Backtesting – There were no holding company exceptions, at either the 95 or 99 CL.

#### **FOR THE MEMO**

- Lehman recent raised its holistic limit for risk, Risk Appetite, to \$4 billion. They also increased their firmwide VaR limit to \$150 million, although the divisional limits were not increased in conjunction with this decision. As diversification between the businesses has fallen and correlation between markets has increased, Lehman wants to make sure VaR was set at a level that would not consistently be exceeded due to market moves rather than active risk tasking.

## **LEHMAN MONTHLY RISK MEETING (MEETING HELD 8/11/08)**

### **FINANCIAL OVERVIEW (Martin Kelly, Gerry Riley)**

Net revenues for the month are (\$670m), which generates a pre-tax loss of (\$1.548b), and an after-tax loss of (\$1,084b). The real driver is FID, with writedowns in resi and commercial. Resi net writedowns were \$2.1b, and commercial was \$400m. The net writedowns are essentially the gross, as there are no big hedges left.

Within that resi \$2.1b, \$300m was from Alt-A loan, \$200m was from AAA Alt-A, \$600m was subordinated AAA bonds, and \$300m was residuals (so in total, \$1.4b in the Alt-A space). Another \$200m was 2<sup>nd</sup> lien loans, and \$300m was UK securities. As far as balance sheet reduction, from the \$24.9b at the end of Q2, Lehman is now at \$21.1b, a combination of writedowns and sales. Doing some rough math, I'd say the majority of that reduction is writedowns rather than sales. They hope to be below \$15b by quarter end. Gerry noted that everything below AAA in the Alt-A securities space is now marked around 20-22.

As for commercial, the overall reduction is still around \$3b. They internally say that they have \$46b left in terms of real estate "at risk", a number which does not have the accounting gross-up but includes GREG and PE interests (and Archstone and Hilton, which are not part of the RE disclosure). They hope to be down to \$43b by quarter end. That \$46b is not a publicly disclosed number, but is how they internally measure CRE exposure. Jeff noted that some of the writedowns are from NY condo developments, one of which they might foreclose on.

Turning to trading businesses, sales credits are down 10% across all businesses. Equities were at \$235m, of which \$230m were generated by the US. They continue to get hurt by KSK, the India power plant (a prop position held by GTS) and on some KSK hedges when the hedges rallied. GTS was also hit on a GMAC position. In the US, liquid markets and equity strategies were strong, while converts were weak across the board. In Europe, quantitative strategies lost \$25m on a mean version trade where they were long energy and short financials. In Asia, vol, converts, and equity strategies all had a bad month. In FID, Global rates, HG credit, and commodities all did well.

Banking was at \$250m, with M&A down despite a big Staples deal closing (\$16m in fees). Underwriting was down. The pipeline is at \$575m, up from June. IMD made \$245m. Asset management and private equity fees were down slightly, and AUM were down (by \$5b) as well, and are at \$281b. There was little income from the minority stakes.

### **CREDIT RISK (Vince DiMassimo, Steve Simonte, Kevin Chichester)**

#### Leveraged Finance

- Unfunded commitments declined from \$940m as of 7/15 to \$579m as of 8/7/08. Drivers included:

- New Commitments: Sunguard Data Systems (\$100m) was the only new leveraged loan commitment during the month. LB is serving as advisor to Sunguard on the acquisition of a French company and the \$100m represents 10% of the financing commitment. GS is the lead underwriter of the loan. The commitment is at current market terms and Kevin noted that Sunguard's debt (currently between \$6-7 billion from the 2006 LBO transaction I believe) has held up relatively well in the market compared to other LBOs. They expect the deal to close around October. The facility is made up of a term loan (BB-) and bridge to bond (B-).
- Closed Deals: The Booz Allen transaction (\$453) closed during the month and was fully distributed at "full fees". While the entire amount was shown as being syndicated on the leveraged debt report, Kevin said that he thought they may have kept \$10-15m for relationship purposes.
- Funded commitments fell from \$3.672bn as of 7/15 to \$2.953bn as of 8/7/08. Drivers included:
  - The Booz Allen deal was a net increase of zero since closed and fully syndicated during the month.
  - The largest changes include:
    - Applebee's/IHOP (-\$159m).
    - First Data Corp (-\$107m)
    - CDW Corp (-\$118m),
    - Other large sales include Home Depot Supply (-\$93m), and TXU (-\$69m). FX changes were -\$21m.
  - Kevin stated that most of the sales this month were cash sales and at or near the current marks. The only significant divergence in sales price vs. the previous mark was the Endemol Holdings position sold back in June. The difference in the previous mark and ultimate realized loss on that position was largely due to not having a good comparables for the exposure. All the positions sold this month were deals that Lehman has continued to sell month after month and thus the marking methodology for these are of higher quality.

#### Counterparty Credit Exposure

- Total CCE across the firm decreased by \$6.3bn to \$48.1bn. Exposures decreased across derivatives and financing.
  - The biggest decrease came in the Energy sector as commodity prices (particularly oil and natural gas) decreased significantly. This resulted in massive decreases in exposures to the firm's energy producing counterparties. *(See significant exposure decreases below for the biggest decreases in the energy sector).*
  - The stock loan/borrow CCE decreased as there was a rolling off of secured lending activity- down almost \$2 billion.



- Lehman's non-IG exposure decreased from 7% to 5% of total firm CCE over the month, largely the result of the decrease in the energy sector.
- Significant exposure changes include:
  - Regarding the top 10 CCE exposures, Italy remains at the top (although at decreased levels from the month before \$2.8bn vs. \$3.4bn. The TXU exposure, which jumped into the top 10 exposures the previous month due to the run up in commodities prices (nat gas) fell off the top-10 as nat gas prices decreased substantially. Most of the remaining top-10 exposures are to SPVs, which bucked the trend and actually increased in exposure this month. Of course, most of these exposures are related to protection bought on ABS CDOs from monolines or from SPVs where the monolines are GIC providers. (*See monoline section below for more details.*)
  - On the weekly liquidity call (Wednesday following the monthly risk meeting), Robert said that the firm may try to novate some of its Sovereign risk (e.g. Italy derivative trades) to Bankhaus. If they are able to do this, it will insulate Holdings from further potential liquidity drains as the opposite side of these trades (i.e. the market risk hedges) are to financial counterparties that MTM daily.
  - Most of the top 10 energy exposures decreased dramatically over the month.
    - TXU's CCE decreased from \$479m to \$158m
    - Chesapeake Energy Corp CCE decreased from \$407m to \$104m. We also asked if the negotiations to get a first lien on PPE had been completed. Vince said they are still working on this.
    - Linn Energy CCE decreased from \$305m to \$187m.
    - While energy producer exposures decreased dramatically on the fall in oil and gas prices, some energy consumers (e.g. airlines) exposures increased as previous payables turned to receivables (e.g. Continental Airlines jumped into the top 10 energy MPE with \$46m CCE and \$115m MPE).
- Steve said that July may be the worst month in the last 6-7 years (this following a horrendous June). He said that was largely due to the equity markets but that the short financials long commodities trade didn't help hedge funds either.

Steve reiterated what he said last month with respect to hedge funds as a sector not seeing a contraction since the early 1990s. September may be an interesting time to watch redemptions this time around to see if money is redistributed within the category or if the sector does in fact contract.

With all the poor performance, they didn't have any problems with hedge funds (and really didn't see a lot of hedge fund blow ups in the market either).

- During the month, one hedge fund group focused on the energy sector lost > \$1 billion. Lehman has a \$100m MPE to the firm driven by the calls and put-spreads it sold to the client on oil and natural gas. This counterparty (TBP) has met all margin calls and has reduced positions but remains exposed to further price declines.

- Monolines:

As of the end of July, Lehman had a CCE, net of reserves, of \$836m to monolines. The largest exposures are to: (1) Assured (\$365m); (2) X/L (\$254m); (3) FSA (\$105m); and (4) Ambac \$59m.

The firm also has \$613m (on a VoD0 value) of hedges against these exposures for a net \$223m (VoD0) exposure to monolines down from \$357m in June. The decrease was the result of increased VoD0 value of the CDS trades referencing monolines.

- ACA- the monoline finally reached a settlement with its counterparties. ACA made a cash payment (1% recovery value) to its counterparties and turned over 95% of residual interest in the entity to its counterparties in exchange for terminating \$65bn worth of CDS contracts.
  - Lehman received \$12m or 1% of its claims which was in line with prior reserve calculations.
- CIFG/ FGIC/ X/L- these three monolines have been and continue to be in discussions with counterparties to tear up trades in exchange for partial cash payments. Some of these discussions are bi-lateral and some are multi-lateral efforts. They discussed the M/L deal with X/L to rip up trades and the the Citi deal with Ambac. In both of those bi-lateral deals, the pay out was less than the reserves booked against the exposures.
  - X/L- they discussed the bilateral deal with ML as phase 1 of a broader effort which allowed them to buy some time to arrange a multilateral agreement with its 17 counterparties.

While Lehman has one of its biggest exposures to X/L (\$591m gross CCE; \$254m net of reserves, which are 67%; and \$68m net of reserves and hedges) it is not involved in any bilateral discussions with monolines. That said, I believe they are included with the other counterparties in multilateral discussions with X/L and CIFG. They said that FGIC are still just pursuing bi-lateral discussions with counterparties. Lehman's exposure to both CIFG and FGIC are not material.

- Bluepoint RE, which popped up on Lehman's top-10 NIG MPE list, is looking to get an out-of-court settlement. On the Thursday before our meeting, Bluepoint filed a "winding up petition" in Bermuda and the regulator has appointed a liquidator. This may provide a test of the insolvency proceedings. Lehman expects the recovery to be around 20% - which is reflected in their current reserves.
  - LB is a small counterparty to Bluepoint with \$46m CCE and \$12m net of reserves.

### High Grade

- The Allstate deal discussed last month appears to be highly unlikely now as the seller is increasingly less likely to go forward with the transaction.
- The one new high grade financing that appears to be going forward is the \$2.5 billion financing of CVS' acquisition of Longs Drug Stores. LB has 50% or \$1.25bn of the commitment. (Lehman did not give the names - this was "Project Laguna", but based on press coverage we're fairly certain this is the deal to which they referred).

### **MARKET RISK (Mark Weber, Jeff Goodman)**

- Risk was essentially flat over the past month, with some changes in diversification. Most businesses stayed close to home in terms of risk taking, and the net equity delta was hovered in the \$1b range (or lower). The rates IR01 tended to be around \$2m/bp in either direction. In terms of major changes, rates went from flat to \$2m/bp short, credit stayed flat, equities were mostly flat (\$700m delta), and firm equity delta was relatively flat, holding in the \$3.2b to \$3.4b range. The public equity delta exposure increased when KSK went from a PE to public position on July 13, which added \$500m (this hits the firm equity delta number).
- Risk appetite usage was basically unchanged (up \$31m) at \$3.4b. There were line-item increases, such as commodities (up \$60m), HY (up \$100m), and SPG (up \$300m). These were offset in part by equity vol flow (down \$125m) and the equity division (down \$70m overall). Firmwide VaR ended at \$104.0m, essentially unchanged from last month's \$103.9m. FID was at \$99.1m versus \$103.2m last month, while Equity was at \$15.7m (versus \$19.1m last month).
- In the FX space, the desk went short Euros and long Yen. They were bullish on the \$/Euro, and scaled back this position as it went their way.
- We walked through the new "Weekly Risk Management Highlights Memo," which replaces the Firmwide risk snapshot. This is written by the risk managers, and is not vetted with the business. This is not widely distributed on the business side - only to the divisional level. It consists of a "Highlights" section which is predominantly general market color, then "Fixed Income Division" which walks through the products (SPG, Real estate, Rates, FX, HG Credit, HY Credit, CDOs, Munis, ARS, Commodities), "Equity Division," "Principal Investing," "Credit Risk," and "Sovereign Risk Management." There is also a more quantitative snapshot that goes

with it, which has risk appetite at a fairly high-level background, as well as aggregated risk exposures such as IR 01, equity delta, etc. Jeff pointed out that these are not useful as P&L predictors, as the aggregation does not account for various factors (such as liquidity). There is a section on counterparty credit risk and stress test results, and also on 10Q disclosure items and changes within. On the second page of this are major market indices and indicators.

- For SPG, the bullets focused on reductions in the resi mortgage portfolio.
- For real estate, the focus was on spread widening and potential sales and accompanying financing. There was also note of balance sheet reduction due to paydowns on European properties, and a partial syndication of one mezz loan.
- Rates talked about the Fannie/Freddie sub debt position that generated losses and was discussed last month, as well as Asian rate risk (mostly in Japan).
- FX focused on risk in the Turkish Lira position, which is apparently something that Kashiuk et al are focusing on.
- HG Credit was focused on the autos, and the desk was long \$825m of LEH bonds.
- CDOs discussed supersenior CLOs, which are apparently still ok.
- ARS talked about recent buybacks – Lehman’s exposure in ARS stands at \$3b. They are looking at customer positions in response to all the recent settlements.
- Jeff characterized a debate around the European Carbon business, which has commitments to purchase about 10MM tones from three Chinese projects. They are trying to decide “how much do you hedge,” much like with deal-contingent swaps. There are unusual risks in this (e.g. UN hurdles), and Lehman is going to establish a formal investment committee process around these types of transactions.
- Equities – risk is low, syndicate desk is reducing block trades, and losses in momentum trades mentioned previously.
- Principal investing – challenging market conditions (KSK, GMAC).
- Credit Risk – monolines, energy hedge fund lost (T. Boone Pickens), and Deal-contingent F/X trade. Credit risk also noted that Munich Re has ceased trading with Lehman because their exposure has risen to \$385m due to purchased puts. Credit pay post 25% of the MTM in return for an agreement from Munich Re that they would resume trading.
- Sovereign Risk – Russia/Georgia, South Africa, and Pakistan. Biggest exposures are in Russia (country stress shows a \$90m loss, driven by being long in credit products and long \$300m of the RUB), followed by South Africa (\$70m, driven mostly by FX).

### For the Memo

- Lehman debuted its new weekly risk reporting snapshot used to brief senior management. It provides a much more detailed breakdown of trading positions and principal investments than prior versions, and also has sections focusing on counterparty credit and sovereign risk. We will continue to discuss the evolving firmwide risk management framework as the newer senior managers refine the process.
- In a reversal from the prior month, Lehman's current credit exposure to non-investment grade counterparties has decreased substantially over the past month from a recent high in June, driven predominantly by a decrease in exposures to energy producing corporate counterparties as oil and natural gas prices plunged in July. However, with respect to hedge fund counterparty credit risk, Lehman has one energy hedge fund group counterparty that lost more than \$1 billion in July on long positions in oil and natural gas. While this hedge fund group has continued to meet all margin calls and decrease positions, they are still exposed to further declines in oil and natural gas prices. Lehman's potential exposure to this hedge fund group currently stands at approximately \$100 million. We will continue to monitor this exposure.

## FINANCIAL RESULTS (MARTIN KELLY, STEVE ROSSI, TONY STUCCHIO)

- Net revenues were a very low \$660m, a level not seen since late 2003. There were strong client revenues, as fixed income and equities sales credits were up 30% during the month, but also offsetting large writedowns.
  - Within FID, they had a net loss of \$152m. IRP was strong including prop. The US Trading desk did very well on steepeners, making \$300m versus \$70m run rate. Rates made \$615m in January and February. HG and HY were both up too, while commodities was flat. FX had \$100m of revenues, and \$130m over the past two months. Prime services made \$130m, and \$270m over the past two months.
  - Equities had revenues of \$200m. Cash and volatility were good, with the volatility books up \$260m for the month and \$390 for two months. Prime services was up \$105m for January and \$190 for two months. Positions have been greatly reduced, with most of the revenues coming from flow trading.
  - Writedowns were \$1.2bn net, \$2.2bn gross during February. CRE loss \$820m gross, \$670m net. Roughly \$160m was due to spread widening and \$500m across assets, including bridge equity. Securitized products lost \$730m gross, \$220m net, as they had \$2bn short CMBX positions on as a macro hedge. CDO lost \$50m net. Auction Rate Securities lost \$90m net, and the contingent acquisition facilities lost \$225m.
    - Jeff noted that the fundamentals for CRE were much better than implied by the marks, but they marked at where the market is.
  - February has seen a further deterioration of assets, with additional losses projected to be \$1.1bn, driven by the CRE and CAF spaces. For the quarter they will probably be flat for net income.
  - Structured notes had a \$270m gain in January on spread widening versus a loss in December as spreads tightened.
  - Lehman had a significant gain on the Indian power plant position within GTS. There was a wide range of possible values, and we may want to follow up on the price verification of this position.
  - Investment Banking was at \$264m with M&A fees and debt origination strong. Equity origination was weak. The pipeline of fees at \$800m is off a little. Investment Management had a strong month with revenues of \$347m.
- The holding company capital ratio was 10.7 for December and they expect the ratio to be 10.6 in January. The new capital from the debt issuance will push the number over 11.
- LBI had positive profit in January, but they expect February to be a loss and will report that to FINRA.

- On the back of weak US performance, non-US revenues were 70%. Asia did have a strong month with no writedowns.

## CREDIT RISK (STEVE SIMONTE, VINCE DIMASSIMO)

### Counterparty Credit Risk

- As we had requested, we walked through the CVA calculations for the monolines. At Lehman, CVA and Credit Reserves are not the same thing. There are a couple of different calculations.

	CCE (\$m)	Credit Reserves (\$m)	ICR	Generic Spread		Specific Spread	
				bps	CVA (\$)	bps	CVA (\$)
MBIA	11.6	0	AA	94	1,093,722	711	10,584,881
AMBAC	40.8	0	AAA	63	1,720,391	774	23,328,937
XL	458.5	136.9	AA	94	18,662,671	295	81,148,706
FSA	13.4	0	AAA	63	686,475	67	744,260
Assured	142	9.6	AA	94	1,276,593	102	1,487,920
FGIC	43.1	0	AA	94	390,493	102	435,643
Totals	709.4	146.5			23,830,345		117,730,347

- Lehman calculates a generic spread-based CVA calculation, where the spread is based on the internal rating of the counterparty and mapped to a generic sector-based spread curve. For AAA-rated counterparties in the financial sector, the generic spread is 63bps and for AA counterparties it is 94bps. The CVA is then computed from the generic spread. As of January month-end, the monolines (excluding ACA, which is treated as a non-performing counterparty) were rated either AA or AAA and thus the generic spread based CVA numbers were rather low, totaling \$23.8m. This is the calculation that is in production.
  - For counterparties where there is a divergence between the spread implied by the internal rating and the specific name's spread, Lehman calculates a specific spread. The specific spread CVA is then computed from the specific spread. This calculation is being used for MBIA, AMBAC, and XL.
  - Credit Reserves are calculated as a percentage of CCE. For XL, this percentage differs depending on the legal entity to which Lehman has exposure.
- In other monoline news:

- Assuming default of all monolines they estimate a firmwide potential loss of about \$500m. That number is down because they have recently purchased protection on Ambac.
- Another extension of the forbearance agreement has been granted, now out to April 23. MTM on ACA was \$826m as of 1/22, reserved at 90%.
- Steve mentioned that downgrade triggers to post collateral for GICs could cause a liquidity problem for the monolines, but he did not think this was an imminent threat.
- Following S&P's downgrades of RMBS and CDO, two Lehman originated ABS CDOs (Corona and Pyxis) triggered an Event of Default. The EoD related to ratings triggers of the underlying securities which affected the overcollateralization test. Lehman's exposure to the two CDOs is \$1.9bn CCE arising from buying CDS protection from the CDOs on the deal collateral. Lehman owns the senior notes on Corona and is seeking to liquidate the transaction. The protection purchased by ACA against this has been reserved. For the other CDOs, there is a guarantee from a large financial institution (CIBC or SocGen). Steve expects the EoD to be hit for the other two CDOs soon, perhaps as soon as March. The following is a summary of the exposures:

Counterparty	CCE	Cash in CDO Vehicle	Estimated Liquidation Claim (CCE-Cash)	Event of Default
Corona Borealis	\$963m	\$736m	Lehman VFN \$227m	Yes
Pyxis ABS CDO 2007-1	\$933m	\$468m	CIBC VFN \$465m	Yes
MKP Vela CDO Ltd.	\$754m	\$310m	SocGen swap \$444m	No
Libra CDO	\$735m	\$187m	SocGen swap \$548m	No

- Note that the default of Corona gave Lehman a claim against ACA as a policyholder, not just as a creditor. As part of the forbearance agreement, Lehman agreed not to pursue the claim. Lehman's rationale was that pursuing the claim would have pushed ACA into receivership, and they would have then have to take their chances with the Maryland insurance regulator, possibly waiting 30+ years for resolution.
- Aggregate CE rose to \$51.2bn from \$45.3bn, mainly due to increases in exposure to banks and financial institutions. The CE to hedge funds rose to \$773m, still not a large number but larger than it normally is, due to margin calls around the end of the month as a result of choppy markets.
- Notes on the top exposures:
  - Two of the top Non-IG counterparty exposures were to Houghton Mifflin and Pinnacle Foods, two leveraged finance clients to whom Lehman was able to sell interest rate hedging associated with the levfin transaction.



- Hedge fund clients on the list are due to either the trades being put on before the Master Agreement was put in place, but the trade was margined (Harbinger) or waiting on a margin call (Capula).
  - Lehman also has exposure to Countrywide resulting from collateral callback risk (Lehman has posted excess collateral with Countrywide). Countrywide does servicer hedging with Lehman.
  - No new names in the energy space, but they are continuing to ramp up their energy operation.
- On the hedge fund front, they are continuing to see redemptions and a need to reduce positions as a result of poor performance in certain funds. Steve said there was some “horrible” performance in January, with the hot spots being the usual suspects – CMBS, credit, munis. Sailfish defaulted, which was not a surprise, and they do not expect any problems with the unwind. Lehman is their prime broker. Lehman is also dealing with a default situation in London with the Cheyne ABS Fund, a €100m fund which sold protection to Lehman. They defaulted on a margin call, and are currently looking for new capital within Cheyne, which Steve does not think they will get. Deutsche is their prime broker. We will follow up on this next month.

#### Leveraged Finance

- The LevFin commitments continues to decline, with the commitments at \$2.884bn as of 2/20 from \$5.264bn as of 1/17. Changes included:
  - New commitments to Press Ganey (\$160m) and Local Insight Regatta (\$73m)
  - Revised commitments from expirations (Booz Allen Hamilton, \$765m, may return later under different terms and Birds Eye Iglo, \$147m). Arysta Lifescience declined by \$267m as most of the commitment was sold, although some will fund next month. Boise Paper Company decreased by \$411m as the paper cleared the market. The first lien was sold at 95, within the flex, resulting in positive P&L, while the second lien sold at 90, beyond the flex, resulting in Lehman breaking even. There were lots of large and small institutional buyers, and was definitely considered a success in the current market.
  - Three deals closed. Regent Seven Seas (\$175m) was fully sold, although Lehman’s mezz fund bought \$60m. The mezz paper was priced at 98.5. Most of Dana Corp (\$800m) was sold, although Lehman did fund \$110m, which they said was kept to facilitate post-close trading. None of Captive Plastics (\$130m) was sold, leading the entire amount to be funded. The position is a bridge to a bond, which is secured by assets behind a ABL revolver, and there is currently no market for this paper.
- Funded commitments rose from \$10.869bn as of 1/17 to \$11.163bn as of 2/20. In addition to the 2 closed and funded deals mentioned above, several existing deals had small (<\$100m) increases in funding requirements. The syndication was

closed on two deals, ACTS (\$63m) and Vertrue (\$101m) and the positions moved to the secondary desk.

- Looking forward, FairPoint Communications (\$624m) could close in March depending on state regulatory approvals, and all the other commitments will close in the end of March or later.

### Investment Grade Exposures

- Imperial Tobacco closed on its acquisition of Altadis, resulting in Lehman funding \$2.2bn of the total \$3.1bn commitment. The commitment is split between a \$1.9bn 1-5yr senior loan facility and a \$1.2bn equity bridge facility that matures July 17, 2008. General syndication for the senior loan facility launched February 8, with spread ranges from L+60 to L+72.5 depending on tenor. The desk expects syndication to take 6 weeks, after which Lehman will still hold \$1.2-1.4bn.
- The large mining acquisition discussed last month is still in negotiations. Vale, the third largest mining company, seeks to takeover Xstrata, the fifth largest mining company. The Executive Committee has approved Lehman to make a commitment up to \$3bn.
- Lehman is serving as M&A Advisor to Carlsberg in a joint bid (with Heineken) to acquire Scottish & Newcastle. [Not sure if this is Non-IG or IG.] Lehman has committed to 25% of the £2.489bn long term funded debt facilities and 30% of the 1-year £3.161bn funded equity bridge. The equity bridge will be funded, and by June Carlsberg will do a rights issue to take it out. The loan facility will be in syndication and they expect to hold \$250-500m by April.

### **MARKET RISK (JEFF GOODMAN)**

- VaR was down significantly this month, from \$145m to \$108m. This was driven primarily by FID, down from \$117m to \$83m. While some business, such as securitized product, did see their VaR drop, Mark Weber explained the drop as resulting from a 15% increase in intra-FID diversification. Equities was mostly unchanged, ending at \$15m from \$17m last month. In addition, the diversification between FID and equities has increased, also contributing to the drop in VaR.
- In conjunction with the move downwards in market risk, risk appetite dropped from \$3.667b to \$3.559b. However, the actual drop in RA was offset by a slight increase in RA usage for investment banking (92m to 174m) and principal investments (678m to 745m). We typically don't speak much about investment banking RA usage, but it is driven by loan positions and JVs where i-banking is involved in origination. That said, investment banking does not hold any trading positions itself. Risk appetite usage in High Grade credit was up \$116m this month, due to widening credit spreads (credit spreads blew out to all time highs, with the LCDX out an additional 150 bps and the HY CDX out 140bps. HG spreads also widened). Securitized products decreased their RA, along with their VaR, as they went shorter home equity loan spreads. Also, the never-ending writedowns are shrinking the actual positions. Real

estate's RA usage is up \$300m. In this area, when they have a write-down, there is an increase in risk of loss lower down the capital stack.

- We are now getting a new snapshot of risk appetite usage that shows diversification benefits by RA component. Right now, total firm diversification across all three components appears to be around 35%.
- Equity delta has been going down considerably, moving in the flat-to-short range across the liquid businesses (equities, GTS, GPS). 6 months ago, GTS and GPS alone had \$2-3b in delta (although by my count they're not that far under \$2b right now). At the time of our meeting, the global equity business was long \$744m.
- Lehman had big write-downs on January 30 and 31 (31 was nearly \$500m), which resulted in at least one holding company exception, and they expect one more. There is some focus on the timing of the multiplier – Lehman seems to feel that the multiplier will have a big affect on the capital ratios, which is not something we have generally seen. Also, there are questions about taking a huge write-down in one day and having this trigger an exception, as that is not really what VaR is intended to capture. That said, they are considering these exceptions for now.
- Rich Kinney gave the risk committee a presentation on the resi market, focusing on the writedowns and the business model going forward. While origination remains shutdown, there is significant raw material that can be re-packaged with more credit enhancement.
- Gary Killen, the head of the muni business, gave us an update on the municipal market, focusing on auction rate securities.
  - Lehman is the lead on \$9.5b of tax-exempt and \$2.5b of taxable ARS. They currently own \$3.4b in inventory, of which \$500m is taxable. The limit has been set at \$4.5b, so there is still some headroom. However, Lehman, like everyone else, has stopped supporting its programs. During the financial overview part of the monthly we were told that overall auction rate inventory was at \$6.4b – this includes corporate auction rate securities that are outside of Gary's purview.
  - The muni business has been working on this issue since November, and looking to convert issuances to VRDN, making it 2a7 eligible, or to longer dated issuances.
  - At some rates, the smart money has come in (like when the NY Port Authority hit 20%), and Gary said that currently there was not much trading in the double digits, but rather around 8 or 9%. Apparently, you need 30 days to termination auction-rate security issuances and 40-50% of the market should be out by May. Universities have an easier time in restructuring their paper, while regulated utilities have a slower lead-time due to approvals and the like. In addition, sometimes an issuer might not have an underlying rating, or may need a new LOC. Also, counsel that is experienced in this area is in high demand right now.

- Gary does not expect munis to return to the ARS market. It may continue to exist, but in a much smaller state.
- Returning to VRDNs, 2a7 are currently boycotting FGIC and XL paper, as the liquidity bank can terminate its facility if the insurer is downgraded below a certain level. Around 13 issuers have been told by their banks that they will terminate their liquidity facilities (they have to give between 45 and 90 days notice to terminate). Lehman has some of this paper, and can put back the paper to the liquidity provider with 7 days notice, so they can manage this risk. That said, banks are still willing to provide liquidity facilities for AA issuers. Gary seemed to think that HNW clients can buy VRDNs directly – we had previously hear that this tends to be more institutional than retail, unlike auction rate securities. That said, Gary noted that most VRDN issuers are good credits with other borrowing opportunities. There is more concern around issuers such as healthcare providers or small, rural issuers.
- TOBs are still trading, as Lehman is the liquidity put provider and 2a7 funds are still OK about this. Of the \$8b program, \$4b is customer financing, which Lehman can cancel, and about \$4b is Lehman financing of their SAVR inventory.
- CMBS: This update is from the 2/8 CSE Inspection Group kick-off meeting, and was given by Ken Cohen, head of CMBS. He spoke with us in the fall, and probably would have given this update at the regular monthly meeting had he not met with us just a few weeks prior
  - Just to clarify, Ken is responsible for CMBS product. Paul Hughson is in counterparty who focuses on securitization/syndication/bridges – he has the bridge equity, and deals with term loan syndications. Therefore, Archstone falls under Paul rather than Ken.
  - Total, market-wide CMBS issuance in 2007 was over \$300b, they expect around \$50b in 2008.
  - Ken noted that prior to the market disruption; approximately 15% of whole loans were syndicated to insurance companies and German banks. Initially, when the securitization markets closed, the market turned to those buyers to pick up the slack, but that group could not absorb all the sudden excess.
  - We briefly discussed the rating categories, and who buys. AAA go to money managers, pensions, banks, insurance, and hedge funds. AA and A is a small piece, and goes to insurers and money managers. BAA goes to insurance companies and others who do not have MTM accounting. These used to be purchased by CDOs, which are no longer purchasing, so now insurance companies are back in this space. 4-5% of the capital stack is considered to be below IG, and tends to be purchased by B-piece buyers – there appear to be around 200 of these. Ken gave an example of Lennar (which came out of the RTC mess), who is owned by Cerberus. B-piece

buyers basically buy the first loss piece, and visit the assets in person. IOs tend to be AAA, and are effectively the “first money out.” They primarily go to pension funds with long-term liabilities. Floating-rate classes go to financials and hedge funds. The floating-rate market is in worse shape than the fixed, and Ken said that he cannot give even a ballpark of where you could exit a floating-rate origination right now.

- Lehman’s current balance of fixed rate inventory is \$43.5 (according to a market intelligence report, not controllers), and the 60+day delinquencies are at .47, which is slightly above the weighted average of .34. However, it has a high credit indicator (a good sign), which is the excess of 60+day delinquencies and cumulative liquidations over age implied rate.
- While the CMBX is fairly liquid, the single name CDS market in commercial real estate never really took off, as the CMBX effectively killed this burgeoning area. Kenny thinks that the widening in the CMBX is insane and maddening. For a while, cash ignored the derivatives, but when the difference became too great the cash bonds had to move as well (although not by as much at the time of our meeting). Ken feels that spreads have gone way too far in relation to the fundamentals (current levels implied 60% PD with 50% recovery rates), and said that he has been to two conferences since he last saw us, and one of them was primarily for B-piece buyers who feel the pain first. He said that only thing they were truly worried about was Texas multi-use properties, which they have been worried about for 20 years. He noted that the Hilton syndication is going bottom up, and that the riskiest tranche (\$4b) has been placed with 11 sophisticated buyers. The hardest to place right now is the IG bonds.
- At the time of our meeting, we’d been told that real estate was taking around \$700m in write-downs. Ken estimated that he felt about 10-15% of those were true credit impairment (mainly in PTG), and that the rest was just MTM movement. He seemed even more frustrated than the last time we met, and noted that lots of residential desks are using the CMBX as a macro hedge since it has further to fall. Ironically, the Lehman subprime desk currently has a \$2b CMBX hedge on that is making them money, employing the same strategy that Ken was bemoaning. Jeff Goodman noted that the irony is not lost on the ABS and CMBS traders. Ken made an offhand comment that if he had the cash to meet margin calls, he would personally sit there all day selling protection on the CMBX at these levels. He also told an anecdote about meeting the day prior to the meeting with a big NYC commercial realtor, who said that he had a client in downtown who had 60K in space but needed 100K. This guy didn’t have it, so the tenant went out and found a sub-tenant. In commercial real estate, apparently if you (the lessee) get a sub-tenant to pay more than your rent, you get 75% of that difference and the landlord gets 25%. This tenant, who was paying \$29/sq foot found someone to rent at \$39/sq foot. The real estate guy didn’t like this deal, so basically let the tenant out for a

nominal fee (apparently, despite the economics, most companies don't want to get into the landlord business). Three days later, the guy rented the space out for \$41/sq ft. Kenny took this as an indication of the NYC commercial real estate market's health, and said that no one was looking at the fundamentals. He did agree that some of the deals of last year had crazy leverage (like Harry Macklowe) and assumed very aggressive rent growth rates, but that the market is not nearly as bad as current spreads would imply.

### FINANCIAL RESULTS (MARTIN KELLY)

- February's results were significantly improved over January. Net revenues were at \$1.3bn, with net income of \$187m. The comp ratio for the month was up to 57.6%, which averages out to 52.5% for the quarter.
  - Fixed income revenues were a loss of \$171m due to additional writedowns. (We will get more on this at the Quarterly Financial Review in mid-April.) Equities revenues were high at \$863m, which includes at \$550m gain on a power plant in India with GTS. IMD had solid results of \$357m due to equity pickups, especially DE Shaw. IB had decent revenues of \$306m.
- March's results, on the other hand, were "extremely challenging." Revenues came in at zero, leading to a pre-tax net income loss of \$900m and a post-tax net income loss of \$660m.
  - Fixed income recorded a loss of \$620m. Securitized products was written down \$550m, \$130 were in Europe and the rest were in the US, with \$300m coming from prime/Alt-A (Peleton) and \$100m from the legacy subprime books. Real estate was written down \$360m, a main driver being the Archstone equity position. FRL and leveraged loans were written down by \$300m. GPS and GTS had losses of \$270m and \$150m respectively. Bright spots included munis, high grade credit, and prime services. In addition, **FID recorded a gain of \$800m on the spread widening of Lehman debt.**
  - Equities had a gain of \$160m for the month. Equity vol took a loss, while execution services was solid. **The equity division recorded a gain of \$275m on the spread widening of Lehman debt.**
  - IB had a gain of \$190m. M&A was ok, while debt origination was weak and equity origination suffered the most. IM had a gain of \$240m.
- LBI excess capital came in at \$2.5bn for Feb month-end, in line with their target. LBI had a large loss of \$1.47bn in February, but positive net income of \$79m due to a tax benefit and equity in subs.

### MARKET RISK UPDATE (JEFF GOODMAN, MARK WEBER)

- Risk appetite was \$3.7bn as of 3/12, up from \$3.56bn the prior month. HY usage decreased to \$1.113bn from 1.514bn due to sales of some loans as well as increases in CDX hedges. Securitized products increased to \$869m from \$678m as some hedges rolled off. Munis increased to \$315m from \$181m. Within

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<sup>1</sup> The regular monthly risk meeting scheduled for 3/20/08 was cancelled due to market events surrounding Bear Stearns. We held an abbreviated meeting on 4/1/08.

equities, the syndicate RA rose to \$126m from \$21m due to a large \$300m block trade (more below).

- VaR was \$139.5m as of 3/12, up from \$108.4m the prior month. One-third of the increase was driven by increases in risk, while the remainder was driven by decreases in diversification.
- Equity delta increased over the period from \$2.49bn to \$3.47bn. IR01 has been fluctuating between \$8-9m and Lehman remains long rates.
- Funds within IMD are experiencing problems with the loss of value of ABCP paper in the funds. Within the Whistlejacket fund, there is ABCP with \$250m face value that currently has a market value of \$170m. Lehman took this paper out of the fund so that it would not be downgraded, paying a price above the current market value. There is also \$300m of Sigma paper in some of the funds, which has not been downgraded yet but is being watched closely.
- The Lehman ABS Libor Fund has also been experiencing problems. Lehman did a series of CDOs, and put the cash proceeds from the CDO into assets in this fund. The 16 “clients” of this fund are the CDOs. The assets are 85% subprime (although the documents do not use the subprime but instead use the phrase “home equity”) and the NAV of the fund has been plummeting. The return to equity of the CDO has been falling because of this. Lehman took out everything that was AA-rated and below as well as assets on negative watch, which totaled \$400m, and replaced the assets with other non-subprime assets. The assets were valued near par, resulting in a loss to IMD of \$160m. This brought the NAV of the fund back to the 90s. Although Lehman was not obligated to do this, they did so for franchise protection. [Lori, I also have that FID wrote a put spread on the NAV .. not sure where that fits into the story.]
- Lehman highlighted the issue of VRDOs, which are having difficulty being remarketed, resulting in the possibility that bonds will be put back to the liquidity provider on the back of monoline downgrades. Lehman’s remarketing book is \$35.8bn (\$14bn insured) of which \$25.7bn is VRDOs issued by munis with third party liquidity support, and the rest (\$11bn) where Lehman is the primary liquidity support. Lehman’s inventory as of 2/25 was \$4bn.
- The syndicate desk bid and won a block sale of 18.7m primary shares/\$400m at cost of \$21.39/share on 2/29. Position as of 3/10 was \$264m. Company will use the proceeds to pay down debt to avoid breach of covenants.

#### **CREDIT RISK UPDATE (VINCE DIMASSIMO, STEVE SIMONTE)**

- Lehman has been in discussions over the past year with the Taiwan High Speed Rail Corp to underwrite a \$4bn issuance of first lien notes as part of an \$11bn refinancing of their debt facilities. Lehman is requiring \$3bn of hard commitments before they will proceed, which they have yet to receive. This exposure is quasi-government risk, in that the debt will be supported by the Taiwan government via a Tri-Partite Agreement. The Tri-Partite Agreement obligates the Taiwanese government to assume the first lien debt obligations in the event of default.



- The large mining acquisition financing between Vale and Xstrata has fallen away at this time.
- A number of counterparties have been on Lehman's radar screen the past several weeks:
  - Peloton: Lehman's financing book, consisting of \$1.7bn in loans, was liquidated in auction on 3/3. Proceeds from the sale were \$778m and the remaining assets were valued by the mortgage desk at \$925m, leaving a shortfall of \$12.4m. Lehman's swap book (\$1bn notional protection on AAA and AA ABX bought by Lehman and \$1.8bn protection on BBB and lower single-name ABS sold by Lehman) was liquidated on 3/5, resulting in a shortfall of ~\$50m.
  - Carlyle Capital: Lehman was the fund's prime broker and financed \$460m of agency floaters at a 3% haircut. As of 3/7, they had an outstanding margin call of \$13m, leaving them with a protection of \$6m between the remaining haircut and a \$5m clearing deposit. In the end, Lehman got out clean.
  - Jefferson County, AL: The Water & Sewer Authority was downgraded amid higher financing costs associated with its auction rate and VRDB debt. The downgrade triggered a requirement to post collateral or monoline wrap to swap counterparties. Lehman exposure relates to a \$190m interest rate swap with a current MTM of \$15m. Lehman has about 4% of \$5bn worth of swaps (JPM holds the bulk). If Lehman closes out their swap, the termination payment would be subordinated to bondholders. The county intends to propose a comprehensive debt restructuring and are asking for a standstill agreement.
  - Muni Hedge Funds: Several hedge funds with leveraged muni exposure via TOB market are facing problems. The NAVs are plummeting, and although the portfolios consist of good underlying collateral, the funds are running out of cash. Lehman's exposure arises from financing muni bonds or from interest rate swaps. Lehman is working with the funds to unwind or de-lever their positions. Total value of muni bonds they are financing is ~\$725m.
  - Mortgage REITs: Shares of mortgage REITs have fallen dramatically. Lehman has no counterparty exposure to Thornburg, but they do have exposure to other names. Total agency repo balances are \$1.5bn and total interest rate swap notional is \$600m. CCE is less than \$5m. Desk has been increasing haircuts on rolls.
- Lehman debated whether to extend a FRL to Deutsche Telecom, ultimately deciding to renew it after discussion at the ExCo. Lehman has €600m revolving credit facility, and have assigned €200m of the facility to Sumitomo and have \$258m of CDS protection. DT has bilaterals with each of its 29 banks providing FRLs, and they renew terms at the "Most Favored Nation" clause. Thus, each bank is providing them financing at L+15, which is very cheap for them.

Although they did renew, Lehman told DT that they would prefer to be the last one drawn.

- Lehman's LevFin pipeline declined slightly to \$2.589bn from \$2.884bn. Main drivers were:
  - New commitment to O'Reilly Automotive for \$300m.
  - Revised commitments to Fairpoint Communications (-\$280m) and Grand Circle (-\$68m)
  - Closed deals to Press Ganey (-\$160m) and Arysta Life Sciences (-\$87m)
- LevFin fundings decreased slightly from \$11.163bn to \$10.293bn. Main drivers were:
  - Closed deal Arysta (+\$87m)
  - Changes TXU (-\$641m, characterized as a good sale), CDW (-\$249m), ARINC (+\$50m), First Data (-\$19m), FX changes (+\$99m, larger than usual due to exchange rate fluctuations)
  - Syndication closed on Arysta (-\$87m) and Dana Corp (-\$110m)
- In addition, they reported that they sold \$680m of Houghton Mifflin the day before our meeting to about half a dozen buyers. The price was in the 90-91 range, close to the internal marks.
- CE rose to \$58.008bn from \$51.206bn, the largest number we have seen. The increase was due to a number of factors including repo positions over quarter end, the subprime CDO exposures discussed previously, and the impact of exchange rates.

## LEHMAN MONTHLY RISK MEETING (MEETING HELD 4/17/08)

### FINANCIAL OVERVIEW (MARTIN KELLY, TONY STUCCHIO)

- March ended the month with negative revenues of \$74m and negative net income of \$708m. Losses in March were primarily driven by a drop-off in customer activity, continuing asset writedowns, and losses on hedges when the cash/derivative basis widened. Martin noted that NPE are getting attention but are somewhat fixed in nature.
  - Banking has been hit hard, with both equity and debt origination performing weakly and advisory work down.
  - Fid lost \$696m, and had \$1.6b in aggregate write-downs. Outside of the writedowns, rates had a tough month – liquid markets was down \$130m after a great start. Losses were sprinkled through other areas – Prime Services made \$100m. GPS had \$40m in losses, and GTS had \$60m. In terms of write-downs, CAF was down \$300m, and writedowns were spread across losses associated with IMD funds. The Archstone equity had a \$150m writedown.
  - Equities made \$151m. Execution services made \$110m, but those were offset by losses in convertibles and volatility. Prime services made \$100m. GTS lost \$87m, private equity lost \$85m, IM seed investments lost \$40m. These losses were offset by \$270m of spread gain allocation (equities gets 25% of the gain).
- In March, LBI had \$900m of trading losses. \$400m of that was a continuation of writedowns, and the rest was spread out – even equities were hit this time, which to date had tone well. \$150m of the IMD/FID writedown was in LBI. These losses were offset to some extent by \$140m in commissions, \$100m in underwriting revenues, and \$200m in interest. Overall net revenues were negative \$504m. Also, LBI was hit on the basis, as LBSF was hit with the indices rallied. In March, Lehman put \$1.2b of sub-debt into LBI, in part to address the increase of the multiplier to 3.85 which increased the VaR charges by \$600m. This proved to be sufficient, as there were fewer writedowns than initially expected (400 versus an estimate 550). Also, Tony noted that Mike had challenged the treatment of ARS, and was reverting to the old 10% haircut approach if they securities couldn't be resold. The ARS inventory has fallen from \$6 to \$5b, and the desk expects to move \$1.5b more over the next two months.
- April has shown improvement so far, although there were \$500m in losses in LB debt as spreads tightened back in (reversing March's \$900m in gains on debt). That said, FID, equity, and IB seem to be steadier, if not normal, and IM is at its normal run rate.
- According to Martin, the big story remained the success of the convertible issuance and the continued delevering, both through asset sales and reduction of risk.

## CREDIT RISK (VINCE DIMASSIMO, STEVE SIMONTE)

### Counterparty Credit Risk

- CE was up to \$59.2bn from \$58.0bn last month. The increase this month came from agented CCE rather than principal CCE. Non-IG exposure was 6% of the total. Historically that number ran in the 2% range, but has been moving up in recent months. The proximate cause of the increase this month was a downgrade of XL to BB. Other drivers of the increase over the past several months have included an increase in the energy business, with its generally non-IG counterparties, and an increase in derivatives transactions with leveraged finance clients. Credit is comfortable with the energy exposures, as this exposure is generally right way risk (i.e., exposure increases as commodity prices increase) and Lehman has a senior secured interest. The levfin transactions are also generally done on a senior secured basis, increasing Credit's comfort with the exposure.
- The firmwide risk snapshot highlighted the monoline litigation situation. Merrill has sued XL, and IKB has sued FGIC. Lehman's take on this is that bond insurers are claiming fraud as a defense to payment under structured finance CDS obligation. Lehman's legal department thinks that XL has little basis against Merrill but that FGIC may have a successful claim against IKB. XL has moved to terminate contracts with Merrill because Merrill entered into a contract with MBIA on the senior AAA level, while having an existing contract with XL on the junior AAA level of the same structure. Lehman has a "double hedge" on \$180m of a \$227m CLO super senior note position with both XL and Assured. The situation is similar to Merrill, but differs in that Lehman has purchased protection on the exact same pieces of the capital stack. The rationale for executing the double hedge with Assured was to provide credit hedge as XL credit deteriorates. CCE on the combined hedge is less than \$10m. While Lehman's exposure is relatively small, Credit finds it troubling that "monolines are pulling out all the stops to wiggle out of commitments."
- The firmwide risk snapshot also highlights a Bear Stearns margin issue, where Lehman owed money to Bear due to a difference in marks. The Lehman traders were flat, so they were not very focused on making sure the marks were correct, and the policy that marks must be accurate has been reinforced. Lehman paid back the money to Bear, which was negotiated by JPM.
- The top IG counterparties remain the same: Italy (\$2.1bn), BH Finance (\$1.7bn), and the CDO SPVs (~\$3.5bn total across the 4 vehicles). AGR Financial Products popped up on the list with a CE of \$443m. This is a CDS vehicle owned by Assured from which Lehman purchased protection on Super Senior CLOs and UK prime RMBS. These are existing positions which have just recently moved into the top 10. Credit does feel that Assured is a "survivor" among the financial guarantors, with less structured credit exposure than others and a viable business

model. That said, Lehman is buying protection on Assured from the Street, including JPM and Goldman.

- On the non-IG side, the top 2 counterparties are exposures to XL that have migrated from IG to NIG due to Lehman's recent downgrade. XL is currently not writing new business. Steve views them as not an imminent default risk, but there are franchise issues which make their long term survival unclear. XL creates separate trusts for each trade they do, which then have guarantees from the parent, so the counterparty exposure is listed as each individual trust. The top exposure is to Portfolio CDS Trust 187 (CE \$328m), which was protection purchased on a High Grade ABS CDO UK securitization, Seago. Lehman has \$108m of reserves against this exposure. The second exposure is to XL Capital Assurance Inc. (CE \$174m) against which Lehman is holding \$80m in reserves.
- Lehman also has a new exposure to the Central Bank of Egypt (CE \$59m). This counterparty does agent secured funding, and the exposure to Lehman comes from overcollateralization against borrows.
- On the top Non-IG MPEs, there is an exposure to Countrywide (CE \$538k, MPE \$160m) which is not a new exposure, resulting from collateral callback risk. BofA has not given formal support for Countrywide's exposures, thus Lehman still considers them Non-IG and does not roll them up with BofA. Countrywide's CDS are still trading around 300.
- There was nothing out of the ordinary of the top hedge fund exposures. A few transport contracts popped up on the top energy exposures (ANR Pipeline \$76m CE, Columbia Gulf Transmission Co \$2m CE, and Kern River Gas Transmission Company \$54m CE).
- Hedge funds to watch include those in the fixed income arbitrage space. The Endeavour Fund has performed particularly poorly, with March down 35%. The fund has been actively trying to bring down risk. Lehman's exposure includes repos, swaps, swaptions, and FX. They previously posted initial margin of 1x99% Tail-VaR (currently \$33m) but that has now been increased to 2x99% Tail-VaR. So far they have met margin calls. Several other funds are running into trouble in this space, and Lehman is working with them to reduce risk or increase Lehman's collateral levels. Incidentally, Lehman does not trade with JWM Global Macro (due to "long memory").

### Leveraged Finance

- Commitments were \$2.132bn as of 4/15, down slightly from the previous month. Two deals were revised: PQ Corp (-\$45m) and Grand Circle (-\$68m). One deal, Fairpoint Communications, was closed (-344m, of which \$155m was funded).
- Fundings were reduced rather significantly to \$8.950bn from \$10.293bn as pieces of several deals were sold to third parties at prices at or slightly above the marks. Note that the items in the Freedom CLO are still included here as Lehman is retaining the economic risk of the positions. Sales during the month included:

- Houghton Mifflin - \$697m sold as of 4/15, with an additional \$165m sold the day before our meeting. The sales were at a price of 90, which is where the position was marked. The majority of the sales of these first lien term loans were done with financing to the third parties at haircuts of 25-30%.
- First Data Corp - \$317m sold to Apollo. Lehman provided financing.
- Applebees/IHOP - \$194m of HY notes sold. Lehman continues to hold \$1.95bn of AAA-rated bonds wrapped by Assured.
- Captive Plastics - \$130m sold at 94 which takes out all of Lehman's commitments.
- CDW – sales just prior to our meeting (and not on report). Sold the entire first lien of \$500m (\$365m to third parties, and \$135m internally), \$500m of the revolver, and \$345m bridge. This was a cash sale. The first lien was priced at 83, near the marks.
- Other changes in the month included Endemol Holdings (-\$74m), CDW (-\$69m), Targa (-\$11m), and FX changes (-\$6m).
- A longstanding commitment, Alliance Data (\$1.309bn), has a June 2 expiration. However, the merger agreement date between the parties was the day of our meeting, April 17, and it was unclear whether the parties would come to an agreement or if there would be an extension. Obviously if the merger fell apart Lehman's commitment would go away.
- Debitel Group (\$294m), which Lehman has been financing since last summer, may be restructured. Debitel may be acquired by another party, and as part of that transaction the existing commitments would roll, but with better terms that would make the deal much more marketable.

#### Financing (High Grade)

- The firmwide risk snapshot highlighted Project Dragon, where Lehman is sole M&A advisor to Finmeccanica, a 34% state-owned Italian electronics, aerospace and defense contractor, on a potential acquisition of "Dragon," a publicly listed US defense electronics contractor. Lehman is the arranger for a \$5bn bridge facility and expects to bring in 2 other banks to share the financing, resulting in a commitment of \$1.67bn. This is a high grade commitment. Post-announcement of the deal, the firm will do a rights issue to raise \$1.4bn-\$2.9bn in equity.

#### **CREDIT VALUATION ADJUSTMENT (FONG LUI, PAUL BONER)**

- Fong gave us an overview of Lehman's CVA methodology. Lehman computes a bilateral CVA, which incorporates both the asset-side CVA (akin to the concept of counterparty credit reserve) and the liability-side (the "liability benefit" reflecting Lehman's credit standing). Lehman has been computing a bilateral CVA since 1Q07. The net CVA is equal to the CVA on the asset side plus the CVA on the liability side, where CVA is approximately equal to the Expected Potential Exposure\*LGD\*PD, or Expected Potential Exposure\*Credit Spread.

Lehman uses financial sector generic credit spread curves for counterparties rated A and above, and generic spread curves (all industries) for counterparties rated BBB and below (based on the ICR, a counterparty is put into a category and then matched to the generic spread provided by research). On the liability side, they bootstrap Lehman's term structure of credit spreads from cash bond prices, which matches Treasuries' calculations for structured liabilities, and use AAA financial spreads for Lehman's AAA subs.

- CVA for monolines using generic credit spreads is \$70m, and \$200m using specific credit spreads. Lehman is still using generic credit spreads. [Plans to switch?]
- For an example of a CVA calculation, consider the case in which Lehman enters into a 10-year par interest rate swap with a \$100m notional with a BB rated counterparty with a credit spread of 346 bps. Lehman's credit spread is about 159 bp. The CVA on the asset side is  $\$3,375/\text{bp}$  (the counterparty's expected potential exposure) \* 346 bps = \$1.16m. The CVA on the liability side is -  $\$1,172/\text{bp}$  (Lehman's expected potential exposure) \* 159 bp = -\$0.18m. The actual total CVA would be the sum of the two, or \$0.98m.
- Lehman dynamically hedges selective counterparty names with liquid CDS markets. The rates derivatives business is the most developed area, with about 150 names hedged. The desk utilizes CCDS (contingent CDS) and LCDS (loan CDS) in addition to plain vanilla CDS. The CVA desk can trade directly with the Street, and therefore can do some less liquid LCDS. Also, the desk sometimes uses market risk factors to hedge. Paul noted that as rates have fallen, they have more exposure to LBOs who swapped out floating rate debt. As a result, for these types of trades, the market risk portion of the hedging has become more important. Also, the desk sometimes uses the new CCDS market, and Paul noted that in a few months he expects to see SSCDS (swap settlement CCDS) in which the deliverable would be a swap claim, which is effectively a perfect hedge. The desk works with traders to price in the cost of credit risk, and for the two largest exposures, Italy and BH, CVA is calculated using desk marks, rather than by Fong's group.
- EPE is calculated using CRM's credit exposure management infrastructure. That is, there is one methodology for all credit risk metrics including EPE and MPE.
- Net CVA for 1Q08 was -\$139m (asset CVA \$2.4bn – liability CVA \$2.5bn). Between 1Q07 and 3Q07, bilateral CVA was positive (meaning that asset CVA was larger than liability CVA). Asset CVA in 1Q08 was greatest for iA rated counterparties. During 1Q, there was an increase in asset CVA to other financials due to the exposure to CDO SPVs. The top counterparties by net, asset, or liability CVA are all the usual suspects: Italy, BH, and XL's SPVs.
- Paul noted that if there is a trade with a large funding component, than part of that trade will be effectively transferred to Treasury (like with the prepaid gas forwards). I'm not exactly sure how this works logistically, or what effect it has on Treasury or the overall CVA adjustment.

## MARKET RISK (JEFF GOODMAN, PAUL SHOTTON)

- VaR was down, at \$127m versus \$140m the month prior. While firmwide VaR fell, FID was up (\$117m versus \$100m) as was Equities (\$26m versus \$16m). However, diversification was up (from 34% to 46%) as the rates exposure was increased and the credit exposure was halved. In addition, the long equities position was increased.
- From March 12 through April 9, IR Europe increased its long exposure from \$1.2 to \$5.6m/bp. HG credit increased its short credit exposure from .7 to 1.5, getting shorter through CDX positions. HY trading is still on but reduced its position by \$1.6m/bp. HY loans reduced two big positions. In the CDO book, index shorts were reduced, and its VaR was down by \$4.6m.
- In equities, while delta was up slightly the biggest driver of the increase in the division's VaR was the equity vol flow desk, which increased its short vega position by \$4.1m/vol pt. This was done through S&P options. Equities did 4 block trades, with the biggest being \$130m.
- With respect to VaR methodology, Lehman went ahead in its 10Q and disclosed weighted vs unweighted VaR numbers, and explained how VaR has been increased due to volatility. Last week, VaR unweighted was 35% lower than the weighted VaR, a difference that seems to be standard right now. Market risk agreed that as a short term measure weighted is better, but given that VaR is used for other things (like capital) perhaps scaling is not appropriate. In other words, the debate continues at Lehman as to whether to keep the weighted VaR methodology in place. This issue was highlighted in the April 14 firmwide risk snapshot.
- European Securitized Products: Jeff walked us through a presentation on European securitized products that was given to the risk committee, and noted as a bullet on the 4/14 risk snapshot. The European ABS new issue market is still closed, although there is some secondary trading in UK and Dutch AAA prime bonds. The outlook for the UK market is negative (-5 to -10% HPA), while it remains mildly positive for the Netherlands. In terms of Lehman's exposure, they have \$5.4b in the UK, predominantly in AAA/AA bonds, \$1.5b in the Netherlands (whole loans), \$1b in Italy (whole loans), a market that they intend to exit by quarter end, and \$290m in Ireland (whole loans), where there is talk of a real estate bubble. Of that UK total, \$1.6b is considered to be high focus – high LTV loans and scratch and dent. Despite all the focus on the UK, while cumulative losses are trending up as occurred in the US, absolute losses are lower than the US. The desk in the UK has moved to hedge this “high focus” group through a variety of instruments – they have between \$1 - \$1.5b of CDS on AAA prime UK mortgages (Jeff gave these notional amounts verbally, but the sheet seems to imply \$426m in AAA prime and \$2,650m in iTraxx), and iTraxx hedges (which help cover the liquidity premium but leaves some snapback risk). The desk also has a macro hedge where they are long \$7m/bp in the front end in Euro, sterling, and dollar positions, which is intended to offer some protection if the economy tanks and CRE and resi become even more at risk (is this represented as the 1.5b Sterling GBP libor cap 5% strike 09-11 on the sheet?)



- Backtesting: There were 4 exceptions at the 95%, and one at the 99%. March 17 was the exception at both levels, with losses around \$500m. John Hoffman was hit on the Treasury rally, munis lost on the muni basis, GTS had a \$53m loss, and equities lost \$33m. On March 19, RE lost \$53m across CMBS and whole loans as well as iTraxx hedges, \$20m on munis, and \$12m on equities as the S&P fell by 2.5%. On March 31, SPG lost \$72m (I'm guessing through write-downs), and on April 2 IR products lost money when the Euro/US curve flattened (they had steepeners on). HG and HY also had losses this day.

## LEHMAN MONTHLY RISK MEETING (MEETING HELD 5/15/08)

### FINANCIAL REVIEW (MARTIN KELLY)

- We first walked through the revenue breakdown sheet (through April) that Martin had produced on our request.
  - CVA: quarter to date, there was a net \$34m CVA loss (as an FYI, spread moves affecting natural gas prepaid forwards hit the CVA line as opposed to marks on Lehman's debt category). That said, March saw a \$399m CVA gain, while April had a \$434m CVA loss, so the numbers are quite volatile.
  - Client revenues (sales credit driven) were fairly strong - \$1.25b in March and \$1.35b in April, comparable with Q1. In terms of franchise trading, i.e. macro bets (ex John Hoffman), however, the story isn't so great. In total, a short credit position and a rate curve steepener (LDN) led to \$650m losses in April, and \$250m of losses in March. The dedicated prop groups actually made \$360m in April, but Martin mentioned that John Hoffman had been way down in March.
  - In terms of losses on hedges, there were \$312m stemming from the derivative versus cash dislocation in the commercial real estate space (from both RE and SPG).
  - In terms of MTM adjustments, there were \$160m in SPG, \$120m in CAF, and \$100m across RE/IMD. Again, you can see the losses on the basis, as the cash assets were being written down while the indices used to hedge were tightening.
- In terms of May, the month was looking much better – for the first 8 days of the month, revenues were \$710m. There was strength across businesses - \$450m in FID, \$150m in equities, \$150m in IBD, \$100 in IMD, and principal investments was down \$30m (there are \$100m in offsets in this group, hence all numbers do not add to \$710m). The origination banking pipeline was decent, in both equities and convertibles. There were also early signs of a pickup in M&A. Also, there was a meaningful pickup in secondary equity issuances. That said, Martin expected to see more writedowns, particularly in commercial real estate – the number we were given was \$700m, which was mostly commercial whole loans and real estate HFS (which is under LOCOM). Interestingly, commercial real estate is exposed to volatility in the iTraxx, while resi has more CMBX exposure than real estate.
  - LBI – Tony mentioned that he had not spoken with FINRA in 3 days, which he took to be a sign of some stabilization. Also, he noted that the Freedom securities had been in LBI and Mike wanted an extra charge on them, but they had been moved out of regulation. There was no big writedown in the b-d in April, with decent commissions and trading, and underwriting was up (the b-d made \$120m from the convertible deal, which is effectively an inter-company transfer).

- Michelle asked if Lehman had revised its RA limits downwards in light of the more pessimistic revenue projections. Martin responded that this has not yet happened, but there will be a June mid-year review.

#### **MARKET RISK (MARK WEBER, JEFF GOODMAN)**

- RA was a \$3.838, up slightly from last month (\$3.672b). This was driven primarily by the market risk/VaR component, as VaR was at \$134.1m, up slightly from the prior month (\$127.1m). FID was at \$105.4m vs \$117.2 the prior month, and equities was at \$32.6m versus \$25.8m.
  - The uptick for equities reflects the vol flow going very short gamma and vega, mostly through liquid indices (the desk's VaR rose to \$26.1m from \$17.9m). As of now, overall equity delta is under \$2b, and is trending in the \$1-\$2b range.
  - Lehman has decided to stay with a weighted VaR.
- During the month, HG credit spreads tightened (CDX IG from 128-105, CMBX AAA 146-107), but the tightening wasn't as pronounced (BBB CMBX 1877-1724). In addition, there was a reversal of the flight to quality, and Lehman's steepener was hit when rates flattened. FID has since cut their rate exposures, and has significantly reduced the steepener. Within credit trading, the desks (HG, HY, and CDO, and NY and LDN) have reduced shorts on indices. They were also hit when the basis came in faster (index versus single names, which they are structurally long).
- As mentioned above, day to day changes in risk appetite over the month were predominantly driven by the market risk component. That said, as loans sold down (e.g. Houghlin Mifflin) the event risk charge declined.
  - Much of the intra-month volatility in RA was caused by credit adding to and subtracting from its short position around Fed meeting expectations – sometimes, the position moved by as much as \$700k/bp in either direction on a given day.
- Backtesting: There were 4 firmwide exceptions, with one on April 15 at the 99% level. The firms was hit by the two big “franchise” trades mentioned above – IR products was hit on its steepener when the curve flattened, and HG, HY, and the CDO book, all of whom were short credit, where hit as spreads tightened.
- Firmwide Risk Snapshot Market Risk topics
  - Lehman participated in a Eurotunnel E900m rights offering – their share was E225m. In addition, the FX desk was considering a deal-contingent trade in conjunction (the contingency is a lack of regulatory approval).

- On April 28, risk highlighted the interest rate steepener position was highlighted, where the desk was extremely long at the front end (\$4.5m/bp at 1Y, and \$6.2m/bp at the 2Y). According to Jeff, Andy Morton and Kashiuk were “on this trade,” and the traders were making the argument that this was a big macro hedge. Jeff also said that people were seeing big P&L numbers from this position, and Risk wanted everyone to understand how big this position was.
- Highlighting of Lehman’s exposure to GLG’s share price (they have 33.7m shares, held at 18% discount – value is \$249m) – price fell due to resignation of one of GLG’s star traders.
- Mortgage inventory disclosures – At the end of Q1, Lehman had \$74b in MBS inventory - \$32b in resi (non-agency securities, whole loans which may be GSE-eligible, and servicing – NO TBAs or agencies are included in that number) and \$36b in commercial (whole loans and securities). Starting with commercial, Lehman, on the Q1 earnings call, said that they would get down by \$5b. As of 4/40, they were at \$34.8b, but still hoped to make the target (Martin subsequently told us that they ended around \$29b). As for resi, the target was to get down to \$25b, which we were later told they also hit. Those exposures include those held by GTS, Rich Kinney, and IMD (Liberty View). Separately, Lehman also has about \$13b of HFS real estate which is under LOCOM, and intended to reduce that to \$12b. As for subprime, Lehman was at \$4b and was targeting \$3b by quarter end, another target they made.
- Acquisition finance and HY disclosures – we learned that the disclosures here will not equal the numbers we see under “HY business,” as Archstone and Hilton are considered corporate debt (I believe in the disclosure).
- Fixed income FX exposures – highlighted that Lehman was long \$500m US versus the majors, short \$1b Euro, long \$280m JPY, long \$2.5b local currencies against USD, and short EMG FX vega \$15m/vol point unweighted.

## **CREDIT RISK (VINCE DIMASSIMO, STEVE SIMONTE)**

### Counterparty Credit Risk

- CCE fell from \$57.7bn to \$55.4bn. Note that last month’s agented CCE was revised due to a month-end adjustment. By product, CCE fell across the board with the exception of Stock Loan/Borrow which increased by \$3.9bn due to dividend arb activity.

- There was a restatement on the CCE by region this month. Previously, hedge funds and other entities domiciled in locations such as the Cayman Islands, but actually headquartered elsewhere, were mapped to Latin America/Caribbean. CRM felt this was not a true reflection of the risk, and thus have changed the mapping for these entities to reflect the location of their principal business.
- The list of top counterparty exposures has not changed materially.
  - Ministry of Finance Italy remains the top exposure with a CE of \$2.3bn.
  - BH Finance remains the second highest exposure from Lehman's purchase of puts written by BH. CE is \$1.5bn.
  - Ballyrock ABS CDO 2007-1 is an SPV on the list with subprime and midprime collateral. The CDO is far from its EOD triggers.
  - The Corona Borealis CDO is being liquidated this month. The drawdown of the GIC, which had been written by Rabobank, occurred and Lehman received the proceeds. Lehman is not taking any losses on this CDO. The three other CDOs have also hit their EOD triggers but are not being liquidated at this time. Lehman is working with the Super Senior providers to determine if they should collapse or continue the structures.
  - Calyon is on the list of top MPE exposures with CE of \$244m and MPE of \$1.1bn. Lehman's exposure to Calyon is partly through muni pre-paid gas swaps. Because Lehman has unique walkaway provisions with these structures, they are not concerned with this name at this time.
  - On the top NIG exposures by CE, CMA CGM SA is shown on a gross basis of \$200m CE. CMA, a French shipping company, needs to trade with a regulated European entity in order for netting to apply. Lehman is in the process of novating the trades from LBCS to Bankhaus. After netting, the CE will be \$50m.
  - Lehman's CE to Countrywide is \$835. Lehman recently improved the ISDA contract with Countrywide to provide a higher threshold and reduce the cure period. This continues to be a name of concern for CRM.
  - "8117A Energy Fund" is a top hedge fund MPE exposure. This is a T. Boone Pickens fund from which Lehman purchased out-of-the-money puts. Lehman currently owes this fund money.
- Lehman recently downgraded Indymac 4 notches to BBB-. They also added a springing collateral clause for initial margin, to include 5% across all swaps. Lehman always has had variation margin. Indymac had a \$5bn portfolio, but got rid of 2/3 of the portfolio before the initial margin requirements were put in place. The remaining portfolio necessitated a \$94m initial margin requirement, which Indymac paid.
- Rescap is in the process of restructuring its debt following a Moody's and S&P downgrade, with a 6/2 deadline in place. Current Lehman exposure is:

- \$304m of net inventory exposure. Lehman had a scratch and dent warehouse facility with Rescap for \$600m which was marked-to-market with sizeable haircuts.
  - CE is \$0, while MPE is \$68m.
  - GMAC inventory is \$637m, with the largest being in GTS, which has had the position for years.
  - Lehman also has a backstop facility with GMAC's ABCP which currently funds at L+20. The cost of funding is changing to L+350.
- On the monoline front, Ambac and MBIA are still “in purgatory.” MBIA has been able to generate some new business so their business outlook is slightly stronger, while Ambac has had no new business. Lehman thinks they are both adequately capitalized. Lehman is comfortable with FSA and Assured. Steve commented that there has been a “loud silence” on the attorney general front with respect to FIGC. XL has only \$80m of room to breach their regulatory solvency requirements. Lehman has reserved \$207m and has a \$80m CDS hedge, which collectively covers 40% of the exposure. (Post-meeting, we heard from Jeff Goodman that CRM was increasing its reserve on XL. We will follow up next month.)

### Leveraged Finance

- Lehman's unfunded commitments declined from \$2.132bn to \$826m. New commitments included Bonten Media Group (\$162m) and Wesco Aircraft (\$100m). Revised commitments included McJunkin (-\$192m) and Alliance Data (-\$1.309bn) which was a Blackstone deal that fell apart. Alliance Data was marked at 99 so there will be minimal P&L associated with the commitment going away. There was one closed deal, Local Insight Regatta Holdings (-\$73m).
- Funded commitments fell from \$8.95bn to \$7.728bn. One deal, Vought Aircraft, closed for \$200m. This was a quick deal that has been allocated now to investors, and Lehman has a small hold of \$5m. Changes in the funded amounts include:
  - HD Supply (-\$619m): Lehman sold bonds to Bain and Carlyle, 2 of the original sponsors of the deal, for a price of 75. Lehman is financing the sale with a 50% haircut, and because they have sold bonds, Lehman can call for additional margin.
  - CDW (-\$411m) and HMR (-\$148m) were discussed last month.
  - ARINC (-\$103m) and PQ Corp (-\$100m) were second liens that were sold to Carlyle at 85 with financing and a 50% haircut.
  - Fairpoint (-\$12m) and FX changes (-\$29m) completed the funding changes.
- Lehman holds \$310m (\$243m MV) of loans issued in connection with Local Insight Media's acquisition of Hawaii Telecom. Originally Lehman intended to engage in a Whole Business Securitization, but due to market conditions this did

not occur. Lehman funded the acquisition with term loans, intending to take out the loans once the WBS notes were issued. In connection with the acquisition, Lehman executed a deal-contingent interest rate swap with LIM. The swap provides for mandatory cash settlement on 5/30 predicated on the completion of the WBS, which has not occurred. Lehman delivered a demand to LIM for the WBS to be executed, but it is uncertain what will happen. LIM owes \$25m on the swap, but cash settling the swap would require a cash infusion from the parent which could impair the tax-free nature of the merger. Lehman says they will securitize the loans, even if there is no market, and the situation is very adversarial now. We will follow up next month.

#### **UPDATE ON LEVERAGED LENDING MARKET(JIM SIRRI)**

- Jim Sirri, who runs Lehman's corporate acquisition finance and high-yield businesses, gave us an update on the leveraged lending from both a market and Lehman specific perspective.

#### Overall Market Color

- Jim said that the last several weeks had been good in the leveraged lending market, particularly for the following categories:
  - BB rated names
  - B rated names in energy/power
  - More generally, if the credit quality is good or the sector is right (e.g. energy), the paper can be distributed as a number of funds have built up a lot of cash and are willing to invest.

Jim said the leverage loans had reached a low of 86 (on average, some names were much lower) but have since rallied up to an average of 93 **for flow names**. Jim pointed out that the European part of their book is harder to sell/syndicate without price discounts as the European banks have their own problems (**Lori/Michelle did you hear this too- my notes on the European side were very sketchy. Didn't catch this.**)

- Loan syndication calendar- The calendar has come down significantly to approximately \$90 billion which has helped on the supply/demand front. **[Jim said his estimate is that the calendar is in the neighborhood of \$70 billion.]** That said, the recent news on Clear Channel (i.e. the sale and financing were completed) has caused a little bit of an overhang on the market but not a radical change.
- On the demand side, he noted the increased interest by non-traditional buyers such as the private equity firms and equity income funds. These entities along with hedge funds have been substantial buyers. He also said that the CLO market isn't coming back any time soon (although not sure anyone thought it was). Jim did say that while the average CLO is invested 3-4% in cash some are in the 10-12% range, which should lead to pressure to invest those funds.

## Financing Terms

- As opposed to earlier times, LB has agreed to financing to distribute its portfolio of leveraged loans. There has been significant reduction in the firm's funded loans over the past two months, with a significant portion of the sales being down with financing. Jim said that most accounts were getting access to financing.

However, Jim said that recently they have only been providing "normal financing" (i.e. through TRS with upfront and on-going MTM) vs. more structured trades. He also said that given that they have moved a significant amount of their portfolio now, there would have to be some other reason to provide financing going forward.

- Financing arrangements have predominantly been structured as TRS with initial haircuts at 25% for 1<sup>st</sup> liens and 50% for 2<sup>nd</sup> liens and ongoing MTM agreements. However, the firm has done some more aggressive types of financing.

Jim walked us through a range of financing options that had he had seen used (not all utilized by LB however) ranging from most conservative to least conservative. In all these cases, the first loss piece was distributed (so some real risk transfer). *(In our semi-annual meeting with Credit Suisse, we heard that that firm (and also RBS) had done some transactions where the firm retained the first loss piece. So in those cases, more of a balance sheet and disclosure move than a real risk transfer. Jim didn't seem to be aware of this activity which not only means LB wasn't engaging in this sort of risk transfer but that also this type of activity must not be too mainstream.)*

- Normal TRS type transaction. Recourse trade (albeit to a lower rated counterparty in many cases) with initial haircut (25%), a daily MTM, and minimal threshold.
- Same as above but the daily margin call isn't made until the loan is down 10 points and don't have to bring the margin back all the way to the initial buffer.
- A structured trade with an SPV (bankruptcy remote) created by the buyer (PE firm), with either no MTM or with a mark-to-model with a large threshold. In these cases, really relying on that initial margin (or haircut) to provide your protection. They had a couple of these trades. However, in one case, the full interest payment on the leveraged loan went to pay down the financing (Jim referred to this as "full interest payments turbo down the debt").
- Full five year financing with no MTM or other provisions (i.e. the most far away from normal financing trades). Jim said that LB didn't provide any of these trades. (That said, they do have trades with similar duration, e.g., HD financing for 5 years.)

## Underwriting terms for new deals



- Nothing new here. The leverage has decreased; pricing flex increased as well as structure flex (including issuing with OID) has gotten better. LB's commitments @5/13/08 were less than \$1 billion.

#### **FOR THE MEMO**

- Lehman had negative net revenues of \$1.2 billion for the month of April. Drivers of the losses included ineffective hedging of positions as cash and indices basis widened, a negative mark-to-market adjustment on Lehman's debt valuation as their spreads tightened during the month, and negative credit valuation adjustments. As of the time of the monthly meeting, May's revenues looked better, but second quarter earnings are anticipated to be poor. Lehman has been attempting to prepare the markets for this news, and we continue to monitor closely the firm's liquidity position as their earnings release date approaches.
- Lehman's leveraged finance pipeline continues to shrink, with unfunded commitments falling to \$826 million and funded commitments at \$7.7 billion. Since the last meeting, Lehman sold \$619 million of its Home Depot Supply bonds to two private equity sponsors. However, they are providing financing on this transaction, albeit with a 50% haircut and with the right to call for margin should the value of the bonds fall.

**The Bear Stearns Companies Inc.**  
**Financial Review - Quarter ended February 28, 2006**  
**Meeting held April 20, 2006**

This was the first formal quarterly financial review/Treasury meeting held with Bear Stearns under the CSE supervision program. With the addition of the quarterly internal audit review for Bear Stearns, all five CSEs are now covered in OPSRA's monthly and quarterly review process.

**Firmwide Results:**

For the first quarter of 2006 Bear Stearns reported records for net revenues, net income and diluted earnings per share (EPS) of \$2.2 billion, \$514 million and \$3.54, respectively, with strong results from all businesses and record net revenues from the institutional equities, fixed income and wealth management segments. The comparable fourth quarter 2005 amounts were \$1.9 billion, \$407 million and \$2.90, respectively, with all three measures being the previous quarterly records. The first quarter was characterized by increased levels of customer activity and improved market conditions. Bear Stearns did not experience the impact on compensation expense in the first quarter of 2006 as some of its peers from the accelerated recognition of stock awards granted to retirement eligible employees that had previously been amortized over a service period as it was already Bear Stearns' policy to immediately recognize the expense related to stock awards.

In March 2006, the SEC and Bear Stearns reached a settlement on the mutual fund market timing case. Pursuant to the Order, Bear Stearns will pay \$250 million, consisting of \$160 million in disgorgement and a \$90 million penalty. Bear Stearns had fully accrued the amount prior to the end of fiscal 2005.

**Segment Analysis:**

	Q1/06	Q4/05	Q3/05	Q2/05	Q1/05
Capital Markets:					
Institutional Equities	488	373	334	391	313
Fixed Income	889	838	739	808	866
Investment Banking	297	231	300	232	217
<b>Total Capital Markets</b>	<b>1,674</b>	<b>1,442</b>	<b>1,373</b>	<b>1,431</b>	<b>1,396</b>
<b>Global Clearing Services</b>	<b>264</b>	<b>263</b>	<b>258</b>	<b>276</b>	<b>271</b>
Wealth Management:					
Private Client Services	129	117	114	106	114
Asset Management	94	67	56	50	55
<b>Total Wealth Management</b>	<b>223</b>	<b>184</b>	<b>170</b>	<b>156</b>	<b>169</b>
<b>Other</b>	<b>24</b>	<b>(2)</b>	<b>11</b>	<b>11</b>	<b>2</b>
<b>Net Revenues</b>	<b>2,185</b>	<b>1,887</b>	<b>1,812</b>	<b>1,874</b>	<b>1,838</b>

## Capital Markets

### **Institutional Equities:**

	Q1/06	Q4/05	Q3/05	Q2/05	Q1/05
Institutional Equity Sales and Trading	179	161	161	163	159
Structured Equity Products	149	127	80	113	86
Total Other Equities	160	85	93	114	68
<b>Total Institutional Equities</b>	<b>488</b>	<b>373</b>	<b>334</b>	<b>390</b>	<b>313</b>

- Institutional equity sales and trading – up \$18 million sequentially with \$13 million from international sales and trading, \$2 million from domestic sales, and \$2 billion from block trades. A focus for Bear Stearns is to grow internationally and European flow business has been increasing at a good pace with the primary drivers in the first quarter being volatility plays and monetization trades (which is a common tax strategy in Europe).
- Structured equity products (principally equity derivatives) – up \$22 million sequentially due to increased customer activity and improved market conditions.
- Other equities – up \$75 million sequentially. Bear Stearns' commodities business is part of the Strategic and Structuring Group (now called the Houston Energy Group – HEG with approximately \$200 in investments) where net revenues were up \$55 million (\$58 million compared to \$3 million). The firm swapped the variable cash flows from its coke battery sale in 2005 with Detroit Edison for fixed flows recording a gain of \$28 million. Bear Stearns investment Michigan natural gas wells recognized \$12 million into income as production began. The arbitrage business showed increased net revenues \$21 million sequentially (\$39 million compared to \$18 million) commensurate with the increase in M&A activity.

### **Fixed Income:**

	Q1/06	Q4/05	Q3/05	Q2/05	Q1/05
Mortgage Backed Securities	397	311	277	306	362
Credit Markets	187	150	132	213	195
Interest Rate Markets	93	149	143	106	157
Fixed Income Sales	112	131	120	143	108
Municipal/Public Finance	15	22	12	5	15
Other Fixed Income	85	76	55	35	29
<b>Total Fixed Income</b>	<b>889</b>	<b>839</b>	<b>739</b>	<b>808</b>	<b>866</b>

- Mortgage backed securities – up \$86 million sequentially. Bear Stearns was the #1 underwriter of US MBS during the first quarter of 2006. Results were mixed across asset classes. Net revenues for ARMs were up \$85 million quarter to quarter (\$163 million compared to \$78 million) with spreads tightening and robust customer activity. The firm benefited from lower prices a while back to increase its inventory for securitization with price rising subsequently. Sequentially, the firm's distressed mortgage business and fixed rate/whole loans showed increases of \$28 million and \$20 million, respectively, while the agency CMO business and CMBS had declines in net revenues of \$33 million and \$14 million, respectively. Agency CMOs experienced net losses of \$3 million in the first quarter.

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- Credit markets – up \$37 million sequentially. Strong results in credit derivatives, high yield, leveraged finance and credit derivatives which produced increased net revenues of \$17 million, \$16 million, and \$7 million, respectively with strong customer demand in CDO space and the improved M&A environment.
- Interest rate markets – down \$56 million sequentially driven predominantly by a decrease in net revenues from interest rate derivatives of \$64 million due to lower interest rate volatility and lower customer volume.

### **Investment Banking:**

- Net revenues up \$66 million to \$297 million for the first quarter of 2006.
- Fixed income underwriting up \$21 million due predominantly to increased activity brought in the high yield market brought on by increased volatility (up \$23 million).
- Merchant banking – up \$65 million sequentially due to increased performance fees from fund investments and the harvesting of investments from the first fund launched. This harvesting phase continued into the second quarter and the segment continues to see good results. The merchant banking group has been successful in a niche strategy in the retail sector, investing in retail firms undergoing restructurings and taking them public.

### **Global Clearing Services**

- Net revenues flat quarter to quarter. Improved net interest margins more than offset lower margin balances and contributed to an increase in net interest revenues of \$9 million that was offset by declines of \$4 million in commissions and \$4 million in other revenue. Margin balances declined as a couple of large hedge fund clients delevered. Equity in customer accounts was higher and customer short balances were flat. Bear continues to generate good results from this segment as it maintains its market share domestically. The growth area is in expanding internationally and Bear Stearns is working to expand its European effort.

### **Wealth Management**

- Private client services - Net revenues up \$12 million quarter to quarter (\$129 million compared to \$117 million), due predominantly to the growth of fee-based activities and assets.
- Asset management – Net revenues up \$27 million sequentially (\$95 million compared to \$68 million) due to increased performance fees (up \$23 million) from two proprietary hedge funds, High Grade and Newcastle.

### **Liquidity and Funding 1st Quarter 2006 Highlights:**

- Parent Company Only Liquidity Reserve – As a condition of CSE approval, Bear Stearns established a parent company liquidity reserve as of its year-ended November 30, 2005. This source of immediate liquidity at the parent company level is a critical component of liquidity risk management at all five CSEs. The reserve must be maintained at a minimum of \$5 billion with a minimum of \$2 billion in cash and cash equivalents and a minimum of \$3 billion in highly liquid, highly rated securities. The liquidity reserve was \$6.15 billion with a borrowing value of \$5.71 billion at February 28, 2005 compared to \$6.17 billion with a borrowing value of \$5.73 billion.
- Total assets were \$300.0 billion at February 28, 2006 compared to \$292.6 billion at November 30, 2005, up 3%. In inventory, corporate debt and other increased \$4.8 billion and corporate equities and convertible debt increased \$2.0 billion. Stock borrowed and reverse repo increased \$4.8 billion and customer receivables decreased \$1.9 billion.

Firmwide net cash capital was \$3.0 billion at the end of the first quarter compared to \$4.6 billion at November 30, 2005. Cash capital needs increased \$4.9 billion due to increased balance sheet necessitating an increased in cash capital sources to \$54.4 billion from \$50.8 billion achieved primarily through long-term debt issuances and increased equity capital generated from earnings.

- Less liquid and illiquid assets were \$28.0 billion at February 28, 2006. This will serve as the benchmark for future quarterly comparisons. Significant categories of less liquid and illiquid assets are:
  - Corporate loans - \$7.2 billion, including distressed loans of \$1.7 billion
  - Non-agency mortgages and unsecured product - \$2.9 billion
  - Unfunded committed funding obligations - \$1.7 billion
  - Global clearing house/exchange deposits - \$1.4 billion
  - Merchant banking/illiquid investments - \$2.3 billion
  - Restricted securities - \$455 million
  - Unclassified/other inventory/mutual funds - \$4.6 billion
  - Other illiquid assets - \$3.3 billion
- Further clarification of the components of the last two categories above has been requested.
- Short-term funding increased \$1.6 billion sequentially. As Bear Stearns has increased its C/P program to the \$20 billion range, Treasury has sought to extend the maturities to reduce the amount of unsecured debt coming due in the very near term. The weighted average maturity (WAM) for C/P at February 28, 2006 was 50 days compared to the WAM at November 30, 2006 of 20-25 days.
- Total long-term borrowings increased \$2.9 billion during the quarter. The firm had issuances of \$4.9 billion and retirements/repurchases of \$2.2 billion.
- For the firmwide stress liquidity analyses, Treasury has moved from their own internally generated stress scenarios to incorporate stress scenarios (Russia/1998 LTCM and 1987 stock market crash) generated by market risk department.
- Treasury had developed a 60 day stress inflows/outflows analysis that it plans to track on a daily basis in the near future. We will get a presentation on this at the next meeting.
- As a recommendation coming out of the CSE review, OPSRA staff requested that Treasury prepare formally documented policies and procedures regarding liquidity and funding risk management. The initial draft was provided to the staff in late 2005. Recommendations for certain additions and enhancements were made in early 2006. The staff requested that the section on regulatory communication protocols be expanded, a section on the parent company only liquidity reserve be added, a section be added on the committed secured facilities, and a governance section on how guidelines and limits are established and/or modified. The revised draft of the proposed changes was provided at the April 2006 meeting and accepted by the staff.

## **Other Notes:**

### **Price Verification Process**

- An overview of Bear Stearns independent price verification process was presented. The process is a joint effort conducted by Business Unit Controllers and Risk Management overseen by the Mark to Market Committee (MTM). The presentation is saved on the J drive.
- OPSRA staff requested that the results of the analysis be presented to us at each quarterly meeting and that we would like to have walkthrough of the monthly package presented to the MTM.

**The Bear Stearns Companies Inc.**  
**Financial Review - Quarter ended February 28, 2007**  
**Meeting held April 18, 2007 and Conference Call held on April 24, 2007**

**Firmwide Results:**

For the first quarter of 2007 Bear Stearns reported net revenues, net income and diluted earnings per share (EPS) of \$2.5 billion, \$554 million and \$3.82, respectively. The comparable fourth quarter 2006 amounts were \$2.4 billion, \$563 million and \$4.00, respectively, representing record quarters for net income and diluted EPS. Favorable markets existing during most of the first quarter were mitigated during the latter portion of the quarter by growing investor concerns over rising default levels in the subprime mortgage market and the declines in the equity markets in last two days of February.

**Segment Analysis:**

	Q1/07	Q4/06	Q3/06	Q2/06	Q1/06
<b>Capital Markets:</b>					
Institutional Equities	513	431	471	560	500
Fixed Income	1,149	1,115	945	1,223	907
Investment Banking	303	364	232	278	296
<b>Total Capital Markets</b>	<b>1,965</b>	<b>1,910</b>	<b>1,648</b>	<b>2,061</b>	<b>1,703</b>
<b>Global Clearing Services</b>	<b>276</b>	<b>271</b>	<b>255</b>	<b>287</b>	<b>263</b>
<b>Wealth Management:</b>					
Private Client Services	136	134	128	130	130
Asset Management	119	113	105	23	95
<b>Total Wealth Management</b>	<b>255</b>	<b>247</b>	<b>233</b>	<b>153</b>	<b>225</b>
<b>Other</b>	<b>(14)</b>	<b>(15)</b>	<b>(7)</b>	<b>(2)</b>	<b>(6)</b>
<b>Net Revenues</b>	<b>2,482</b>	<b>2,413</b>	<b>2,129</b>	<b>2,499</b>	<b>2,185</b>

**Capital Markets**

**Institutional Equities:**

	Q1/07	Q4/06
Institutional Equity Sales and Trading	186	194
Structured Equity Products	161	110
Other Equities	166	127
<b>Total Institutional Equities</b>	<b>513</b>	<b>431</b>

- Institutional equity sales and trading – down \$8 million sequentially. Net revenues from international equity sales and trading were \$8 million higher than the fourth quarter but were offset by reduced net revenues in the domestic markets as volumes were down quarter to quarter.
- Structured equity products (principally equity derivatives) – record net revenues of \$161 million in the first quarter of 2007, up \$51 million sequentially due to increased customer demand for structured derivative products.
- Other equities – up \$39 million sequentially. Net revenues for the energy group (which is now separately disclosed (was part of the strategic and structuring group) were \$13 million in the first quarter compared to losses of \$6 million in the fourth quarter of 2006 due primarily to revenues

generated from the acquisition of 17 power plants in the fourth quarter (“Delta acquisition”). Principal strategies (prop trading group) net revenues were \$18 million higher in the fourth quarter. The arbitrage business continued strong posting a second consecutive record quarter of \$44 million in net revenues.

#### Fixed Income:

	Q1/07	Q4/06
Mortgage Backed Securities	239	370
Max Recovery	36	39
Credit Markets	418	320
Interest Rate Markets	145	132
Fixed Income Sales	140	135
Municipal/Public Finance	16	7
Principal Strategies	4	16
Other Fixed Income	151	96
<b>Total Fixed Income</b>	<b>1,149</b>	<b>1,115</b>

- Mortgage backed securities – Net revenues for the first quarter of \$239 million were \$131 million lower than the previous quarter due principally to spread widening and collateral deterioration in MBS space. Write-downs totaling \$240 million were taken in Second Liens (\$168 million), Subprime (\$19 million), Near Prime (\$14 million), EMC (\$20 million), ABS/CDS (\$7 million), and CBO (\$12 million). The ARMs desk performed well posting net revenues of \$163 million, up \$103 million from the fourth quarter of 2006.
- Credit markets – up \$98 million sequentially to a record \$418 million led by record net revenues for distressed trading and credit trading. The notable positions in the distressed trading portfolio where gains were recognized were in the firm’s IPP positions (MacGen, BostonGen, and LakeRoad, which was sold to a private equity firm) and Calpine. Credit trading net revenues of \$231 million for the first quarter were \$129 million higher than the fourth quarter due to continued favorable markets and significant customer activity. Vox Capital, the firms’ proprietary structured credit trading arm posted \$45 million net revenues in the first quarter of 2007. Net revenues for the full year 2006 were \$46 million for Vox Capital. Leveraged finance net revenues were \$72 million lower in the first quarter due primarily to the timing of deal flows.
- Other fixed income net revenues increased \$55 million from the fourth quarter of 2006 due primarily \$40 million from the mark to market of derivatives liabilities based on changes in the firm’s own credit spreads pursuant to SFAS No. 157.

#### Investment Banking:

- Net revenues of \$303 million for the first quarter of 2007 were \$61 million lower than the previous quarter.
- Equity underwriting net revenues of \$84 million were \$31 million higher than the third quarter as IPO and secondary activity increased. Fixed income underwriting net revenues were \$14 million lower quarter to quarter (\$60 million compared to \$76 million) due primarily to a weak high yield calendar. Other underwriting net revenues of \$11 million in the first quarter were \$25 million lower than the strong fourth quarter that was driven by fees associated with the Blackstone purchase of Equity Office Properties.
- M&A/Advisory net revenues of \$95 million were \$45 million lower than the very strong fourth quarter that was driven by the firm’s participation in the sale of 50% of GMAC and the Verizon spin-off.

#### Global Clearing Services

- First quarter 2007 net revenues of \$276 million were up \$5 million from the fourth quarter. Net interest revenues were up \$9 million sequentially as average margin debits increased to a record \$81.3 billion for the first quarter of 2007 from \$72.0 billion for the fourth quarter. Quarter end margin debits balances were \$86.6 billion at February 28<sup>th</sup> compared to \$78.6 billion at November

30<sup>th</sup>. Commissions were down \$8 million sequentially consistent with the trend of declining commissions resulting from the firm using securities in the box to cover customer shorts.

### **Wealth Management**

- Asset management – Net revenues up \$6 million sequentially to \$119 million. Net revenues from performance fees continued to be strong posting \$56 million in the first quarter compared to \$51 million in the previous quarter driven by the continued strong performance in emerging markets over the past two quarters (\$26 million in the first quarter and \$22 million in the fourth quarter)

### **Liquidity and Funding 1st Quarter 2007 Highlights:**

- Parent Company Only Liquidity Reserve – The liquidity reserve was \$6.0 billion with a borrowing value of \$5.5 billion at February 28, 2007 compared to \$6.0 billion with a borrowing value of \$5.6 billion at November 30, 2006.
- Total assets were \$394.5 billion at February 28, 2007 compared to \$350.4 billion at November 30, 2006, up 13%, due principally to a \$22.0 billion increase in financial instruments owned and an \$11.2 billion increase in securitizations that did not qualify for sale treatment under SFAS No. 140.
- Firmwide net cash capital was \$5.4 billion at the end of the first quarter compared to \$520 million at November 30, 2006 due primarily to a \$4.1 billion increase in long-term debt while cash capital usage was flat quarter to quarter.
- Less liquid and illiquid assets (defined as 100% cash capital items for Bear) were \$39.6 billion at February 28, 2007 compared to \$38.8 billion at November 30, 2006, driven principally by increases in unfunded committed funding obligations. Significant categories of less liquid and illiquid assets are:

(in \$ billions)	02/28/07	11/30/06	08/31/06	05/31/06	02/28/06
Corporate loans	9.6	10.7	7.4	6.3	7.2
Distressed corporate loans included in above	1.6	1.4	1.2	1.6	1.7
Non-agency mortgages and unsecuritized product	4.0	3.7	3.4	2.6	2.9
Domestic equities	3.5	3.5	2.0	2.1	1.3
Foreign equities	3.1	2.6	2.0	1.8	1.6
Merchant banking / illiquid investments	2.6	2.5	2.2	2.4	2.3
Unfunded committed funding obligations	5.6	3.3	5.1	2.2	1.7
Global clearing house / exchange deposits	1.7	1.7	1.8	1.3	1.4
Restricted securities	0.5	0.5	0.3	0.3	0.5
Unclassified/other inventory/mutual funds	5.6	5.4	4.9	4.5	4.6
Other illiquid assets	3.0	2.4	2.7	2.9	3.3

- Short-term funding increased \$3.1 billion to \$32.2 billion at February 28, 2007. Reductions in commercial paper of \$1.6 billion (\$17.6 billion compared to \$19.2 billion) were offset by a \$4.9 billion increase in secured short-term funding.
- Total long-term borrowings increased \$3.9 billion million during the first quarter to \$58.5 billion. The firm issued \$8.1 billion and retired/repurchased \$3.6 billion of long-term borrowings during the quarter.
- Treasury has developed a 60 day stress inflows/outflows analysis that is now a part of the risk management process at Bear. This new analysis adds a short-term cash flow stress scenario as a complement to the one-year stress analysis. This provides a detailed cash inflows and outflows analysis covering the critical period of a liquidity crisis. At March 1, 2007, the excess of sources over uses at 60 days was \$20.1 billion due primarily to the secured funding initiative put in place (see below). At December 1, 2006, there was a shortfall at 60 days of \$526 million that occurred in days 57-60.
- Bear repurchased 2.9 million shares of common stock during the first quarter of 2007 at a cost of \$473 million. Stockholders' equity at February 28, 2007 was \$13.3 billion.

### **Enhancements to Liquidity Risk Management**

- **UPDATE : Increased use of secured funding – US Tri-Party Equity Repo structure** – Upton provided an update on the progress of secured funding initiative. In November 2006, the firm's new products committee approved this structure to be used by Treasury as a secured funding vehicle. The goal is to establish a formal process to continually fund securities on an ongoing basis in the secured market rather than using unsecured short-term borrowings. This would create less reliance

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on commercial paper (amounts outstanding would be reduced), would increase the liquidity ratio and would result in more cash on hand that could be held at the parent company. The tri-party arrangement is administered by JPMC as custodial facilitating term repo activity with a series of committed lenders, each with a \$1-1.5 billion facility. Initially securities were put out at 30 days with a goal of moving to 6 and 12 month evergreen facilities. Targets by the end of the first half of 2007 are short-term unsecured debt down to \$16 billion (50% of 11/06 amount), with commercial paper at less than \$10 billion. Progress has been made during the first quarter of 2007 in meeting these goals. At the end of January 2007, \$4.2 billion in securities were funded through this equity repo facility and the firm's short-term funding composition was 72% unsecured and 28% secured. At the time of the meeting, \$13.9 billion in securities were funded through this equity repo facility and the short-term funding composition was 51% unsecured and 49% secured and commercial paper was below \$15 billion. At the next quarterly meeting (to be held in July 2007) Treasury will give a detailed presentation on secured funding initiative and the funding methodologies used by asset class.

- **Parent Only Liquidity Reserve** – As previously stated the secured funding initiative would create less reliance on commercial paper (amounts outstanding would be reduced), would increase the liquidity ratio and would result in more cash on hand that could be held at the parent company. It is Treasury's plan in the not to distant future to change the composition of the parent only liquidity reserve to cash held at the parent and increase the amount to the \$6-8 billion range (more likely the high end of the range). The securities that are currently pledged to the parent company as collateral for intercompany borrowings and included in the parent liquidity pool could be funded on a secured basis under the secured funding initiative to generate cash to be placed at the parent company.
- **Governance** - During the first quarter of 2007 Bear Stearns established a Global Finance Committee which approved the \$2.0 billion net cash capital target minimum discussed below. Treasury will provide a presentation of this committee at the July 2007 meeting.
- **Cash Capital Model** – Effective March 2007 Treasury established a \$2.0 billion net cash capital (NCC) target minimum in response to negative NCC positions that occurred in September and December 2006 and January 2007. Treasury estimates that by keeping a \$2.0 billion cushion there is a less than 5% chance of developing a negative NCC position.
- **Bear Stearns Bank & Trust - BSBT** (formerly CTC) – Bear Stearns has applied for a national charter from the OCC for BSBT. The approval process was delayed by the problems subprime mortgage market although there is no plan to include subprime mortgages in the bank. BSBT will continue the custodial activities that were carried out by CTC as well as be used as a funding vehicle primarily for mortgage loan origination in Bear Res and EMC. Bear Res will be a subsidiary of BSBT. It is estimated that \$5.0 billion in mortgage whole loans will be funded in BSBT in the short-term primarily by brokered deposits and FHLB loans.

**DRAFT**  
**The Bear Stearns Companies Inc.**  
**Financial Review - Quarter ended May 31, 2006**  
**Meeting held July 27, 2006**

**Firmwide Results:**

For the second quarter of 2006 Bear Stearns reported its third consecutive record quarter for net revenues, net income and diluted earnings per share (EPS) of \$2.5 billion, \$539 million and \$3.72, respectively, with strong results from all businesses and record net revenues from the institutional equities, fixed income and global clearing services segments. The comparable first quarter 2006 amounts were \$2.2 billion, \$514 million and \$3.54, respectively. The second quarter was characterized by continued high levels of customer activity, higher volatility and favorable market conditions through most of the second quarter (equity markets and emerging markets were down in mid-May).

**Segment Analysis:**

	Q2/06	Q1/06	Q4/05	Q3/05	Q2/05
Capital Markets:					
Institutional Equities	555	488	373	334	391
Fixed Income	1,167	889	838	739	808
Investment Banking	278	297	231	300	232
<b>Total Capital Markets</b>	<b>2,000</b>	<b>1,674</b>	<b>1,442</b>	<b>1,373</b>	<b>1,431</b>
<b>Global Clearing Services</b>	<b>290</b>	<b>264</b>	<b>263</b>	<b>258</b>	<b>276</b>
Wealth Management:					
Private Client Services	129	129	117	114	106
Asset Management	22	94	67	56	50
<b>Total Wealth Management</b>	<b>151</b>	<b>223</b>	<b>184</b>	<b>170</b>	<b>156</b>
<b>Other</b>	<b>59</b>	<b>24</b>	<b>(2)</b>	<b>11</b>	<b>11</b>
<b>Net Revenues</b>	<b>2,500</b>	<b>2,185</b>	<b>1,887</b>	<b>1,812</b>	<b>1,874</b>

**Capital Markets**

**Institutional Equities:**

	Q2/06	Q1/06	Q4/05	Q3/05	Q2/05
Institutional Equity Sales and Trading	202	179	161	161	163
Structured Equity Products	159	149	127	80	113
Total Other Equities	194	161	85	93	114
<b>Total Institutional Equities</b>	<b>555</b>	<b>488</b>	<b>373</b>	<b>334</b>	<b>391</b>

- Institutional equity sales and trading – up \$23 million sequentially with \$16 million from international sales and trading, \$5 million from OTC stocks, and \$6 million from block

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trades. A focus for Bear Stearns is to grow internationally and European flow business has been increasing at a good pace with the primary driver in the second quarter being European volatility plays.

- Structured equity products (principally equity derivatives) – up \$10 million sequentially due to increased customer activity and slightly improved market conditions for most of the quarter.
- Other equities – up \$33 million sequentially. Gains on the firm’s NYSE investment were \$94 million reflected in specialist (\$35 million) and other (\$59 million). Forty percent of the gains reflected in the specialist business are deducted from earnings as a minority interest. Bear Stearns’ commodities business is part of the Strategic and Structuring Group (now called Bear Energy with approximately \$200 in investments) where net revenues were down \$10 million (\$48 million compared to \$58 million) after a very strong first quarter. Bear Stearns investment in Michigan natural gas wells recognized \$35 million into income (production began in the first quarter) as other commodities related business was down from the first quarter. The event driven strategy in the arbitrage business gave back some of the gains from the first quarter due to the more challenging market conditions late in the quarter recognizing \$17 million in net revenues compared to \$39 million in the first quarter.

### Fixed Income:

	Q2/06	Q1/06	Q4/05	Q3/05	Q2/05
Mortgage Backed Securities	529	397	311	277	306
Max Recovery *	44	50			
Credit Markets	262	214	150	132	213
Interest Rate Markets	171	93	149	143	106
Fixed Income Sales	130	112	131	120	143
Municipal/Public Finance	28	15	22	12	5
Other Fixed Income	3	8	76	55	35
<b>Total Fixed Income</b>	<b>1,167</b>	<b>889</b>	<b>838</b>	<b>739</b>	<b>808</b>

\* Max Recovery broken out separately for 2006.

- Mortgage backed securities – up \$132 million sequentially. Bear Stearns was the #1 underwriter of US MBS during the second quarter of 2006 and for the six months ended May 31, 2006 with 21-22% of market share. Increased net revenues were experienced across all asset classes except ABS which was flat quarter to quarter. Primary drivers were tighter spreads and robust investor demand. Net revenues for ARMs were up \$44 million sequentially (\$207 million compared to \$163 million). Sequentially, the firm’s agency CMOs and fixed rate/whole loans business showed increases \$30 million and \$24 million, respectively. EMC and Bear Res showed increases of \$14 million and \$5 million, respectively, as the firm actively grows its captive origination and retention programs.
- Credit markets – up \$48 million sequentially driven primarily by distressed sales and trading and leveraged finance. Distressed sales and trading was up \$36 million quarter to quarter. Leveraged finance was up \$30 million sequentially as event driven origination volumes (primarily M&A activity) were up 20%. Credit trading was down \$37 million from a very good first quarter.

- Interest rate markets – up \$78 million sequentially driven predominantly by an increase in net revenues from interest rate derivatives of \$68 million with much improved customer volumes after a slow first quarter. Foreign exchange improved \$13 million quarter to quarter.

### **Investment Banking:**

- Net revenues down \$18 million to \$278 million for the second quarter of 2006.
- Equity underwriting was up \$8 million from the first quarter as the market remained strong until late in the quarter. Fixed income underwriting was down \$5 million as increases in high grade (\$6 million) and municipals (\$8 million) were offset by a decline in high yield of \$19 million as investor demand declined. Corporate origination for equities and fixed income was up \$12 million in the aggregate with higher activity in the quarter.
- M&A/Advisory fees were up \$ 144 million sequentially due to a record quarter in completed M&A.
- Merchant banking – down \$75 million to a loss of \$5 million for the second quarter. This harvesting phase that began in the first quarter continued provide gains in the second quarter that were offset by a mark-to-market loss on the investment in NY&Co. of \$35 million.

### **Global Clearing Services**

- Record net revenues of \$290 million compared to \$264 million in the first quarter. Net interest revenues were up \$11 million sequentially due principally to increased average margin debit balances (a record \$68 billion compared to \$64 billion) as some prime brokerage clients that reduced positions in the first quarter increased positions in the second. The quarter-end margin debit balance was \$73 billion. Commissions were up \$3 million and other revenues were up \$11 million (\$7 million of the NYSE gains were booked to this segment. Bear continues to generate good results from this segment as it maintains its market share domestically. The growth area is in expanding internationally and Bear Stearns is working to expand its European effort.

### **Wealth Management**

- Asset management – Net revenues down \$73 million sequentially (\$22 million compared to \$95 million). Net revenues from performance fees were a loss of \$5 million compared to gains of \$47 million in the second quarter as some funds (High Grade and New Castle) gave back some of the significant fees recognized in the first quarter. These fees are recognized on an accrual basis. Net revenues from principal activities were a loss of \$3 million in the second quarter compared to net revenues of \$13 million in the first quarter. The firm had to write down its investment in hedge funds due to lower performance in the second quarter.

### **Liquidity and Funding 2nd Quarter 2006 Highlights:**

- Parent Company Only Liquidity Reserve – As a condition of CSE approval, Bear Stearns established a parent company liquidity reserve as of its year-ended November 30, 2005. This source of immediate liquidity at the parent company level is a critical component of liquidity risk management at all five CSEs. The reserve must be maintained at a minimum of \$5 billion with a minimum of \$2 billion in cash and cash equivalents and a minimum of \$3 billion in highly liquid, highly rated securities. The liquidity reserve was \$6.1 billion with a

borrowing value of \$5.7 billion at May 31, 2006 compared to \$6.2 billion with a borrowing value of \$5.7 billion at February 28, 2005.

- Total assets were \$326.2 billion at May 31, 2006 compared to \$300.0 billion at February 28, 2006, up 9%. In inventory, corporate debt and other increased \$4.0 billion; corporate equities and convertible debt increased \$5.5 billion; mortgages and mortgage and asset-backed securities increased \$1.4 billion; and derivatives increased \$4.0 billion. Stock borrowed and reverse repo increased \$2.1 billion and customer receivables increased \$1.7 billion. Firmwide net cash capital was \$1.5 billion at the end of the second quarter compared to \$3.2 billion at February 28, 2006. Cash capital needs increased \$3.8 billion to \$53.7 billion due to increased balance sheet. Cash capital sources increased \$731 million to \$55.2 billion. Unsecured long-term debt greater than one year increased \$2.2 billion and common equity increased \$665 million generated from earnings. Unfunded note capital (unsecured funding generated by the derivatives business unit) declined \$2.1 billion due to a cash capital methodology change whereby amounts due in less than one year are not included as a cash capital source so as to be consistent with other elements of cash capital.
- Less liquid and illiquid assets (defined as 100% cash capital items for Bear) were \$29.4 billion at May 31, 2006 compared to \$28.0 billion at February 28, 2006. Significant categories of less liquid and illiquid assets are:

(in \$ billions)	05/31/06	02/28/06
Corporate loans	6.3	7.2
Distressed corporate loans included in above	1.6	1.7
Non-agency mortgages and unsecuritized product	2.6	2.9
Domestic equities	2.1	1.3
Foreign equities	1.8	1.6
Merchant banking / illiquid investments	2.4	2.3
Unfunded committed funding obligations	2.2	1.7
Global clearing house / exchange deposits	1.3	1.4
Restricted securities	0.3	0.5
Unclassified/other inventory/mutual funds	4.5	4.6
Other illiquid assets	2.9	3.3

- Further clarification of the components of the last two categories was requested. Treasury provided a detailed listing of the assets comprising those categories for the quarter ended 2/28/06, which consisted of many items of lower dollar amounts. Therefore a further breakout of these categories is not necessary.
- Short-term funding increased \$11.3 billion sequentially driven by a \$10 billion increase in commercial paper. Bear Stearns' target range for C/P has been increased to \$20 billion. The increase in the amount of funding needed for asset growth of mortgages and other loans not funded by the repo desk for securitizations, increased margin lending, and growth in overseas markets (principally equity derivatives in Europe) has been facilitated by increasing C/P. In response, treasury has sought to extend the maturities to reduce the amount of unsecured debt coming due in the very near term. The weighted average maturity (WAM) for C/P at May 31, 2006 was 68 days compared to the WAM at November 30, 2005 of 20-25 days. Overnight C/P is now in the \$300-400 million range. Treasury is pursuing more efficient ways to fund this growth. See "Potential Enhancements ..." below.
- Total long-term borrowings increased \$224 million during the quarter.
- Treasury has developed a 60 day stress inflows/outflows analysis that is now a part of the daily risk management process. This new analysis adds a short-term cash flow stress

scenario as a complement to the one-year analysis. This provides a detailed cash inflows and outflows analysis during the most critical part of a liquidity crisis.

### **Potential Enhancements to Liquidity Risk Management**

- **Increased use of secured funding** – Treasury is exploring ways to fund more assets on a secured basis rather than using unsecured short-term borrowings, possibly through repo similar to what Goldman does for a portion of its whole loan book.
- **Modification to Secured Committed Bank Facilities** - In addition to keeping the three global multi-asset class facilities (US, Europe, and Asia), in response to the growth in unsecuritized product pending securitization, Treasury is considering adding a large asset specific facility for its lending activities (residential mortgage, commercial mortgage, and auto loans) to better support these large and growing businesses.
- **BSB Bank** – Treasury is just beginning to think about using its Irish bank as a funding vehicle for its lending businesses. We will be briefed further as this develops.

### **Other Notes:**

A separate write-up has been prepared regarding the price verification presentation made at the meeting. Refer to the J drive.

**The Bear Stearns Companies Inc.**  
**Treasury and Financial Review - Quarter ended May 31, 2007**  
**Meeting held July 26, 2007**

**Firmwide Results:**

For the second quarter of 2007 Bear Stearns reported net revenues, net income and diluted earnings per share (EPS) of \$2.5 billion, \$362 million and \$2.52, respectively. The first quarter 2007 amounts were \$2.5 billion, \$554 million and \$3.82, respectively. Second quarter results included the effect of a \$227 million (\$124 million after-tax) or \$0.88 diluted per share non-cash charge related to the write-down of intangible assets representing goodwill and specialist rights of Bear Wagner Specialists. Excluding this non-cash charge second quarter net income and diluted EPS would have been \$486 million and \$3.40, respectively. Declines in fixed income net revenues quarter to quarter due principally to the continued deterioration of the sub-prime mortgage markets was offset by strong investment banking, prime brokerage, and asset management results, resulting in a modest sequential increase in net revenues of \$30 million.

**Segment Analysis:**

	Q2/07	Q1/07	Q4/06	Q3/06	Q2/06
Capital Markets:					
Institutional Equities	543	513	431	471	560
Fixed Income	962	1,149	1,115	945	1,223
Investment Banking	357	303	364	232	278
<b>Total Capital Markets</b>	<b>1,862</b>	<b>1,965</b>	<b>1,910</b>	<b>1,648</b>	<b>2,061</b>
<b>Global Clearing Services</b>	<b>317</b>	<b>276</b>	<b>271</b>	<b>255</b>	<b>287</b>
Wealth Management:					
Private Client Services	157	136	134	128	130
Asset Management	184	119	113	105	23
<b>Total Wealth Management</b>	<b>341</b>	<b>255</b>	<b>247</b>	<b>233</b>	<b>153</b>
<b>Other</b>	<b>(8)</b>	<b>(14)</b>	<b>(15)</b>	<b>(7)</b>	<b>(2)</b>
<b>Net Revenues</b>	<b>2,512</b>	<b>2,482</b>	<b>2,413</b>	<b>2,129</b>	<b>2,499</b>

**Capital Markets**

**Institutional Equities:**

	Q2/07	Q1/07	Q4/06
Institutional Equity Sales and Trading	198	186	194
Structured Equity Products	203	161	110
Total Other Equities	141	166	127
<b>Total Institutional Equities</b>	<b>542</b>	<b>513</b>	<b>431</b>

- Institutional equity sales and trading – up \$12 million sequentially. Generally favorable equity markets continued through the second quarter as net revenues from domestic equity sales and trading and block deals were up \$4.8 million and \$3.5 billion quarter to quarter, respectively.
- Structured equity products (principally equity derivatives) – record net revenues of \$203 million in the second quarter of 2007, up \$42 million from the previous record first quarter of \$161 million as

strong customer demand for structured derivative products continues, especially in the London and Tokyo volatility book.

- Other equities – down \$25 million sequentially. Arbitrage net revenues of \$82 million for the second quarter (third consecutive record quarter) were up \$38.1 million due to higher M&A volumes, especially in the international event driven book. The arbitrage desk experienced some tough days in the first half of the third quarter giving back some of its gains. Principal strategies (prop trading group) and energy net revenues were down \$9.5 million and \$9.2 million sequentially. Other equities net revenues, which consist primarily of GAAP accounting adjustments required by SFAS 133, 155 and 157 were down \$43.4 million quarter to quarter due primarily to the mark to market of derivatives liabilities based on changes in the firm's own credit spreads pursuant to SFAS No. 157. Spreads widened in the first quarter resulted in a positive p&l impact from the SFAS 157 valuation, while tightening spreads in the second quarter resulted in negative p&l from the valuation. Given the blow-out in spreads so far in the third quarter, a significant positive p&l impact is possible.

#### Fixed Income:

	Q2/07	Q1/07	Q4/06
Mortgage Backed Securities	301	230	370
Max Recovery	51	36	39
Credit Markets	290	418	320
Interest Rate Markets	77	151	132
Fixed Income Sales	158	140	135
Municipal/Public Finance	(12)	17	7
Principal Strategies	12	7	16
Other Fixed Income	85	150	96
<b>Total Fixed Income</b>	<b>962</b>	<b>1,149</b>	<b>1,115</b>

- Mortgage backed securities – Net revenues for the second quarter of \$301 million were \$71 million higher than first quarter due predominantly to the significant write-downs (\$240 million) taken in the first quarter. While there were additional write-downs in non-agency sub-prime, NIMs, and residuals (\$52 million) and non-agency second liens, NIMs and residuals (\$80 million), taken in the second quarter, write-ups were taken on CDS PAUGs on CDO (\$73 million) and MSRs (\$42 million). Write-downs totaling \$240 million were taken in first quarter. Generally inventory is working its way through the securitization process but a lot of arb has been lost due to the markets. Securitization volumes were down in sub-prime and Alt-A and origination volumes declined in these two categories in April and May due to the industry-wide tightening of underwriting standards.
- Credit markets – net revenues of \$290 million were down \$128 million sequentially from the record \$418 million in the first quarter. Distressed trading and credit trading net revenues were down \$62 million and \$120 million quarter to quarter, respectively, from record results posted in the first quarter for both businesses, still representing good second quarter results. The credit environment continued strong through the second quarter as leverage lending posted net revenues of \$90 million in the second quarter compared to \$32 million in the first quarter. Origination volumes continued to rise. In the third quarter and some committed leveraged lending deals are being hung-up with the potential
- **3<sup>rd</sup> quarter event:** The leveraged lending pipeline at Bear has grown considerably just as a credit crunch has emerged during the third quarter, with leveraged lending (LBOs) particularly affected. Corporate credit spreads have widened significantly and many deals that have been funded or have been committed to be funded are hung-up thereby delaying syndication and impacting syndication prices. The firms have only so much price flex capabilities in the deals so losses incurred may eat away at the fees generated.
- Interest rate markets – Net revenues down \$73 million quarter to quarter as global interest rates business net revenues declined \$80 million sequentially (losses of \$5 million in the second



quarter compared to net revenues of \$75 million in the first quarter) due to weaker markets characterized by lower volatility and reduced customer activity.

- Other fixed income net revenues, which consist primarily of GAAP accounting adjustments required by SFAS 133, 155 and 157, decreased \$66 million from the first quarter of 2007 due primarily to the mark to market of derivatives liabilities based on changes in the firm's own credit spreads pursuant to SFAS No. 157.

#### **Investment Banking:**

- Net revenues of \$357 million for the second quarter were \$54 million than the first quarter, due primarily to higher M&A/advisory fees (\$141 million in the second quarter compared to \$95 million in the first quarter) due to the robust M&A market experienced in the second quarter.
- Equity underwriting net revenues were flat quarter over quarter (\$86 million compared to \$84 million) reflecting continued strong markets and fixed income underwriting net revenues were \$8 million higher in the second quarter. In fixed income, high grade underwriting volumes declined (net revenues down \$12 million) while high yield volumes increased (net revenues up \$13 million). Municipal underwriting net revenues were up \$5 million.
- Merchant banking net revenues were down \$15 billion quarter to quarter due primarily to the firms' investment in NY&Co. which lost \$15 million in the second quarter and had gains of \$15 million in the first quarter.

#### **Global Clearing Services (predominantly prime brokerage)**

- Record net revenues of \$317 million for the second quarter were \$41 million higher than first quarter 2007 net revenues. Net interest revenues were up \$35 million sequentially as average margin debits increased to a record \$95.4 billion for the second quarter compared to \$81.3 billion for the first quarter of 2007. Quarter end margin debits balances were \$108.4 billion at May 31, 2007 compared to \$86.6 billion at February 28, 2007. Commissions were up \$7 million sequentially due primarily to more trading days in the second quarter compared to the first quarter.

#### **Wealth Management**

- Asset management – Net revenues up \$65 million sequentially to \$184 million. Net revenues from performance fees continued to be strong posting \$113 million in the second quarter compared to \$59 million in the previous quarter as emerging markets continue to post higher net revenues quarter to quarter (\$93 million compared to \$26 million). Losses suffered in the high grade funds space resulted in a reduction in performance fees of \$20 million quarter to quarter.
- Continued losses led to redemption calls and the much publicized demise of two funds, one highly leveraged, that invested in ABS backed by risky mortgages (that lost considerable value due the disruption in the mortgage markets, principally sub-prime). Bear did not incur significant losses since it had none of its own money invested in the funds, but the firm has incurred reputational damage as the funds' investors were virtually wiped-out. Late in July, Bear announced that another fund, facing liquidity pressures from redemption calls, would suspend redemptions. This fund has no leverage so there is no counterparty exposure, but fund investors may be negatively impacted. In early August, S&P affirmed Bear's ratings but placed them on negative outlook citing "reputational" risks rather than direct balance sheet risks. Principal trading net revenues (from firm investments in hedge funds and increased seed capital invested in new hedge funds) were \$18 million higher in the second quarter (\$41 million compared to \$23 million). Management fees were \$8 million higher quarter to quarter driven by increases in fees from hedge funds and private equity funds.
- Bear will experience net outflows from asset management funds as portfolio manager James O'Shaughnessy, will be leaving the firm in September to open an institutional-investing business, taking \$12-15 billion of AUM (of Bear's roughly \$60 million) with him.
- Private Client Services – Net revenues up \$21 million sequentially due primarily to increased fee income generated higher levels of fee-based accounts and higher performance fees from funds managed in the PCS business.

#### **Liquidity and Funding 2nd Quarter 2007 Highlights:**

- Parent Company Only Liquidity Reserve – The liquidity reserve was increased to \$7.6 billion in cash at May 31, 2007 compared to \$6.0 billion with a borrowing value of \$5.5 billion at February 28, 2007. See "Enhancements to Liquidity Risk Management" below regarding the targeted build-up of the parent liquidity reserve.

- Total assets were \$423.3 billion at May 31, 2007 compared to \$394.5 billion at February 28, 2007, up 7%. Increases of \$8.0 billion and \$8.8 billion in securities borrowed and customer receivables, respectively, resulted from increased customer activity. Assets related to securitizations that did not qualify for sale treatment under SFAS No. 140 increased \$8.5 billion.
- Firmwide net cash capital was \$3.2 billion at May 31, 2007 compared to \$5.6 billion at the end of the first quarter due primarily to a \$5.3 billion increase in cash capital requirements for the corporate lending while cash capital sources increased \$1.0 billion.
- **Cash capital subsequent to the end of the second quarter:** Bob Upton and John Stacconi called OPSRA on July 10, 2007 to give a heads-up on the June NCC position we would be seeing in their monthly package and to discuss their game plan for July into early August. The NCC situation and Treasury's proposed plan for issuance was discussed at an Executive Committee meeting on June 9<sup>th</sup>. The NCC position for end of June was (\$807 million). Treasury estimated a long-term debt issuance need for June at approximately \$2.0 billion. Since May was the quarter-end, the firm was shut-off from issuing through the earnings release date (June 14). Then came the trouble with the BSAM funds and the related negotiations. Focus in the second half of June was on rumor control, creditor triage, discussions with rating agencies, and the announcement of the possible \$3.2 billion in financing from Bear Stearns. Spreads blew out, reaching the widest point on June 25<sup>th</sup>. Obviously, the atmosphere was not conducive to long-term debt issuance. Through this time, the firm continued to provide liquidity to its bondholders and short-term borrowing remained stable. Hence the negative NCC position at the end of June. The current liquidity position is strong with the PCO liquidity pool at \$12.5 billion in cash and C/P under \$10 billion. With approximately \$1.5 billion long-term debt coming due in July, the projected July LTD issuance need was approximately \$4.3 billion (including the \$2.0 billion target minimum). For July, Treasury wanted to fly under the radar screen and focused on using private placements in issuing 2-3 year MTN's through its network of large investors. \$2.5 billion of 2-3 year MTN's were issued in early-mid July. Treasury had initially planned to issue into the public LTD markets in late July, early August for the additional \$2-3 billion LTD needed, but the further blow-out in spreads and the distress in the credit markets that has occurred in late July has effectively shut-down the public unsecured issuance market. The cash capital need will be covered on a secured borrowing basis using the firm's asset specific committed credit facilities which are a series of committed credit facilities with lending institutions which permit borrowing on a secured basis using specific asset classes as collateral at contractually agreed upon haircuts. Borrowings under these facilities qualify as cash capital. Asset classes include investment and non-investment grade corporate loans, residential mortgages, commercial mortgages, listed options, and auto loans. These commitments aggregate \$6.8 billion and are drawn upon from time to time. At May 31, borrowings under these committed facilities were \$1.2 billion.
- Less liquid and illiquid assets (defined as 100% cash capital items for Bear) were \$45.0 billion at May 31, 2007 compared to \$39.6 billion at February 28, 2007, driven principally by increases in unfunded committed funding obligations. Loan commitments have increased significantly as a downturn in the credit markets, particularly leveraged lending, has transpired in the third quarter causing pricing and syndication pressure. Funded loans may need to be held longer as prices are depressed, reducing net revenues. Significant categories of less liquid and illiquid assets are:

(in \$ billions)	05/31/07	02/28/07	11/30/06	08/31/06	05/31/06
Corporate loans	8.6	9.6	10.7	7.4	6.3
Distressed corporate loans included in above	1.6	1.6	1.4	1.2	1.6
Non-agency mortgages and unsecuritized product	4.0	4.0	3.7	3.4	2.6
Domestic equities	4.6	3.5	3.5	2.0	2.1
Foreign equities	4.0	3.1	2.6	2.0	1.8
Merchant banking / illiquid investments	2.8	2.6	2.5	2.2	2.4
Unfunded committed funding obligations	9.5	5.6	3.3	5.1	2.2
Global clearing house / exchange deposits	2.1	1.7	1.7	1.8	1.3
Restricted securities	0.3	0.5	0.5	0.3	0.3
Unclassified/other inventory/mutual funds	7.7	5.6	5.4	4.9	4.5
Other illiquid assets	4.2	3.0	2.4	2.7	2.9

- Short-term funding decreased \$5.7 billion to \$26.5 billion at May 31, 2007 due primarily to a decline commercial paper of \$4.6 billion (\$11.4 billion compared to \$16.0 billion) resulting from increased usage of secured repo funding to reduce reliance on unsecured CP funding.

- Total long-term borrowings increased \$3.3 billion million during the second quarter to \$61.8 billion. The firm issued \$4.8 billion and retired/repurchased \$1.8 billion of long-term borrowings during the quarter. The YTD amounts are \$13.0 billion and \$5.4 billion respectively.
- Treasury has developed a 60 day stress inflows/outflows analysis that is now a part of the risk management process at Bear. This analysis adds a short-term cash flow stress scenario as a complement to the one-year stress analysis. This provides a detailed cash inflows and outflows analysis covering the critical period of a liquidity crisis. At June 1, 2007, the excess of sources over uses at 60 days was \$29.0 billion due primarily to the secured funding initiative put in place (see "Enhancements to Liquidity Risk Management" below).
- Bear repurchased 2.2 million shares of common stock during the second quarter of 2007 at a cost of \$229 million. Stockholders' equity at May 31, 2007 was \$13.3 billion, unchanged from February 28, 2007, as the increase from net income for the second quarter was offset by stock repurchases.

## Enhancements to Liquidity Risk Management

- **UPDATE : Increased use of secured funding** – The implementation of the secured funding initiative has significantly changed the liquidity and funding risk management framework at Bear Stearns. The goal is to establish a formal process to continually fund more difficult to fund assets on an ongoing basis in the secured market through a series of lending facilities. This would create less reliance on commercial paper (amounts outstanding would be reduced), would increase the liquidity ratio and would result in more cash on hand that could be held at the parent company. The tri-party arrangement is administered by JPMC as custodial facilitating term repo activity with a series of lenders, each with a \$1-1.5 billion facility. Initially securities were put out at 30 days with a goal of moving to 6, 9 and 12 month evergreen facilities. Targets by the end of the first half of 2007 were short-term unsecured debt down to \$16 billion (50% of 11/06 amount), with commercial paper at less than \$10 billion. At May 31, 2007 short-term unsecured debt was \$14.4 billion and CP outstanding was \$11.4 billion (a little short of the target). At the time of this meeting CP outstanding was \$9.0 billion. At the end of January 2007, the firm's short-term funding composition was 72% unsecured and 28% secured. At May 31, 2007 the short-term funding composition was 60% secured and 40% unsecured. At June 30, 2007 the composition was 66% secured and 34% unsecured. The majority of the secured borrowings are currently under 6 and 9 month evergreen facilities, with several 12 month facilities in negotiation. **OPSRA has requested a specific breakdown of the secured funding by asset class and by tenor, indicating those amounts funded through evergreen facilities, as of June 30, 2007.** Given the current market and Bear specific events, OPSRA asked about progress on signing up lenders under the evergreen facilities. Bob Upton and John Stacconi indicated there was no slippage in extending evergreen deals in corporate equity repo space. In fixed income space, two counterparties did not extend.
- **Parent Only Liquidity Pool** – As previously stated the secured funding initiative reduces reliance on commercial paper (amounts outstanding would be reduced), increases the liquidity ratio and provides more cash on hand that could be held at the parent company. Treasury is implementing significant changes to the composition of the firm's sources of liquidity and the analysis of the ability of those sources to cover the firm's cash requirements under stress events. Treasury has targeted a parent only liquidity pool of \$25 billion based on an enhanced parent company only liquidity ratio analysis (see below) to consist primarily of cash and cash equivalents held at the parent with a smaller component being unencumbered securities pledged as collateral for intercompany borrowings. At June 30, 2007, the parent only liquidity pool consisted of \$12.5 billion in cash and cash equivalents. Treasury is actively monetizing previously unencumbered assets on an ongoing basis through the evergreen facilities to build the parent only pool and reduce reliance on the ability to monetize unencumbered assets in regulated entities under stress conditions. As was previously the case, only those assets in regulated entities that are formally pledged as collateral for intercompany borrowings from the parent may be included in the parent only liquidity pool. Unencumbered assets in unregulated entities continue to be viewed as available sources of liquidity.
- **Parent Company Only Liquidity Ratio (PCO liquidity ratio)** – The PCO liquidity ratio measures the excess of available liquidity over liquidity needs over a 12 month period. The analysis is being enhanced to measure the stressed PCO liquidity excess by applying potential liquidity outflows under stress conditions. This combines the PCO liquidity ratio calculation with the separate stress loss liquidity analysis that had been done previously to provide a comprehensive liquidity stress analysis covering a one year time frame. Additional stress items have been added to those originally considered. This enhancement to the PCO liquidity ratio calculation was a recommendation from internal audit. This enhanced measurement, with a \$12.5 billion parent company liquidity pool at June 30, 2007, resulted in a deficit of \$5.7 billion. Bob Upton agreed that under the current market

conditions potential outflows related to lending commitments were probably understated, and that this would be further analyzed. The need to increase the parent company liquidity pool becomes obvious. As a benchmark for sizing the parent company liquidity pool Treasurer's has developed a list of uses of liquidity to be covered by the parent only pool. Refer to pages 13 and 15 of Bear's June 2007 FliP package saved on the J drive. These items were only touched upon briefly at the meeting and we expect to have a more substantive discussion of their nature and calculation of the estimated liquidity use.

- **Expansion of Stress Cash Flow Analysis** – To complement the enhanced PCO liquidity ratio calculation, Treasury will be expanding the 60 day liquidity analysis to a one year comprehensive cash flow analysis to analyze the timing and the nature of cash inflows and outflows.
- **Governance** - During the first quarter of 2007 Bear Stearns established a Global Finance Committee which approved the \$2.0 billion net cash capital target minimum. Treasury was scheduled to discuss the committee at the July 2007 meeting, but the meeting was ended at 2:00 pm due to the loss of the conference room. OPSRA asked for copies of the Committee charter and membership be provided.

**The Bear Stearns Companies Inc.**  
**Financial Review - Quarter ended August 31, 2006**  
**Meeting held October 19, 2006**

**Firmwide Results:**

For the third quarter of 2006 Bear Stearns reported net revenues, net income and diluted earnings per share (EPS) of \$2.1 billion, \$438 million and \$3.02, respectively, with good results in all businesses (overall the best third quarter results for the firm) but lower than the record net revenues from the institutional equities, fixed income and global clearing services segments experienced in the second quarter. The comparable second quarter 2006 amounts were \$2.5 billion, \$539 million and \$3.72, respectively. The third quarter was characterized by the seasonal summer slowdown, reduced levels of customer activity, a flattening yield curve, tighter spreads and less favorable market conditions.

**Segment Analysis:**

	Q3/06	Q2/06	Q1/06	Q4/05	Q3/05
Capital Markets:					
Institutional Equities	436	555	488	373	334
Fixed Income	878	1,167	889	838	739
Investment Banking	232	278	297	231	300
<b>Total Capital Markets</b>	<b>1,546</b>	<b>2,000</b>	<b>1,674</b>	<b>1,442</b>	<b>1,373</b>
<b>Global Clearing Services</b>	<b>269</b>	<b>290</b>	<b>264</b>	<b>263</b>	<b>258</b>
Wealth Management:					
Private Client Services	127	129	129	117	114
Asset Management	104	22	94	67	56
<b>Total Wealth Management</b>	<b>231</b>	<b>151</b>	<b>223</b>	<b>184</b>	<b>170</b>
<b>Other</b>	<b>83</b>	<b>59</b>	<b>24</b>	<b>(2)</b>	<b>11</b>
<b>Net Revenues</b>	<b>2,129</b>	<b>2,500</b>	<b>2,185</b>	<b>1,887</b>	<b>1,812</b>

**Capital Markets**

**Institutional Equities:**

	Q3/06	Q2/06	Q1/06	Q4/05	Q3/05
Institutional Equity Sales and Trading	170	202	179	161	161
Structured Equity Products	93	159	149	127	80
Total Other Equities	173	194	160	85	93
<b>Total Institutional Equities</b>	<b>436</b>	<b>555</b>	<b>488</b>	<b>373</b>	<b>334</b>

- Institutional equity sales and trading – down \$32 million sequentially due to lower net revenues from international equity sales and trading (down \$20 million) resulting from a decline in customer volumes from a very strong second quarter and a \$10 million decline in block trades.

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- Structured equity products (principally equity derivatives) – down \$66 million sequentially due to a decline in customer activity (seasonal slowdown) and weaker market conditions globally. The third quarter 2005 net revenues were \$80 million.
- Other equities – down \$21 million sequentially. Net revenues for the strategic and structuring group (predominantly the commodities business) of \$107 million were \$59 million higher than the second quarter due to the sale of the Orange and Mulberry power plants in Florida that resulting in gains of \$95 million. Other revenues in this group were down sequentially. In the second quarter gains on the firm’s NYSE investment were \$94 million reflected in specialist (\$35 million) and other (\$59 million). Forty percent of the gains reflected in the specialist business are deducted from earnings as a minority interest. The event driven strategy in the arbitrage business rebounded in the third quarter resulting in the arbitrage business posting net revenues \$21 million higher than the second quarter (\$38 million compared to \$17 million).

### Fixed Income:

	Q3/06	Q2/06	Q1/06	Q4/05	Q3/05
Mortgage Backed Securities	312	529	397	311	277
Max Recovery *	54	44	50		
Credit Markets	255	262	214	150	132
Interest Rate Markets	126	171	93	149	143
Fixed Income Sales	122	130	112	131	120
Municipal/Public Finance	12	28	15	22	12
Other Fixed Income	(3)	3	8	76	55
<b>Total Fixed Income</b>	<b>878</b>	<b>1,167</b>	<b>889</b>	<b>839</b>	<b>739</b>

\* Max Recovery broken out separately for 2006.

- Mortgage backed securities – down \$217 million sequentially due primarily to declines in ARMs of \$153 million to \$54 million and declines in fixed rate/whole loans of \$56 million to \$56 million to \$60 million. Less favorable trading markets as spreads came under pressure resulted in lower customer volumes and reduced secondary trading. Bear Stearns was again the #1 underwriter of US MBS during the third quarter of 2006. EMC and Bear Res captive origination continues to grow.
- Credit markets – flat sequentially (down \$7 million). Declines in distressed trading and fixed income investments of \$58 million and \$20 million, respectively, due to lower volumes were offset by increased net revenues of \$78 million from credit trading as the firm benefited from being long protection.
- Interest rate markets – down \$45 million sequentially to \$126 million driven predominantly by a decline in net revenues from interest rate derivatives of \$34 million as volumes declined after a very good second quarter.

### Investment Banking:

- Net revenues of \$232 million for the third quarter of 2006 were \$46 million lower than the previous quarter.
- Equity underwriting net revenues of \$29 million were substantially lower than the \$64 million recognized in the second quarter due to lower volumes. Fixed income underwriting (\$46 million in 2Q06) was down \$8 million quarter to quarter with declines in all three categories, hi grade, high yield, and municipal, as investor demand declined. .

- M&A/Advisory fees of \$132 million were down a modest \$1 million sequentially from the record second quarter. Couple notable deals were Time Warner/Adelphia and Viacom.
- Merchant banking – up \$15 million in the third quarter to \$10 million from a loss of \$5 million for the second quarter. This harvesting phase that began in the first quarter continued to provide gains in the third and second quarters offset by mark-to-market losses on the investment in NY&Co. of \$5 million and \$35 million in the respective quarters.

### **Global Clearing Services**

- Third quarter net revenues of \$269 million were down \$21 million from the record net revenues of \$290 million second quarter. Net interest revenues were down \$5 million sequentially. Quarter end margin debits balances were \$68.9 billion at August 31<sup>st</sup> compared to \$72.7 billion at May 31<sup>st</sup>. Commissions were down \$10 million due to lower transaction volumes in both prime brokerage and clearing businesses. Bear continues to generate good results from this segment as it maintains its market share domestically. The growth area is in expanding internationally and Bear Stearns is working to expand its European effort.

### **Wealth Management**

- Asset management – Net revenues up \$82 million sequentially to \$104 million. Net revenues from performance fees were \$55 million in the third quarter compared to a loss of \$15 million in the second quarter. Returns on emerging markets hedge funds products rebounded from second quarter losses (resulting in performance fees of \$33 billion compared to losses of \$31 billion). These fees are recognized on an accrual basis. Net revenues from principal activities were \$14 billion in the third quarter compared to a loss of \$3 million in the second quarter due to improved performance from the firm’s hedge fund investments.

### **Liquidity and Funding 2nd Quarter 2006 Highlights:**

- Parent Company Only Liquidity Reserve – As a condition of CSE approval, Bear Stearns established a parent company liquidity reserve as of its year-ended November 30, 2005. This source of immediate liquidity at the parent company level is a critical component of liquidity risk management at all five CSEs. The reserve must be maintained at a minimum of \$5 billion with a minimum of \$2 billion in cash and cash equivalents and a minimum of \$3 billion in highly liquid, highly rated securities. The liquidity reserve was \$6.1 billion with a borrowing value of \$5.6 billion at August 31, 2006 compared to \$6.1 billion with a borrowing value of \$5.7 billion at May 31, 2006.
- Total assets were \$334.8 billion at August 31, 2006 compared to \$326.2 billion at May 31, 2006, up 3%, due principally to an \$8.3 billion increase in mortgage securitizations that did not qualify for sale treatment under SFAS No. 140 (\$12.0 billion compared to \$3.7 billion). Firmwide net cash capital was \$360 million at the end of the third quarter compared to \$2.7 billion at May 31, 2006.
- Less liquid and illiquid assets (defined as 100% cash capital items for Bear) were \$34.2 billion at August 31, 2006 compared to \$29.4 billion at May 31, 2006, driven principally by increases in corporate loans and loan commitments. Significant categories of less liquid and illiquid assets are:

(in \$ billions)	08/31/06	05/31/06	02/28/06
Corporate loans	7.4	6.3	7.2

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Distressed corporate loans included in above	1.2	1.6	1.7
Non-agency mortgages and unsecuritized product	3.4	2.6	2.9
Domestic equities	2.0	2.1	1.3
Foreign equities	2.0	1.8	1.6
Merchant banking / illiquid investments	2.2	2.4	2.3
Unfunded committed funding obligations	5.1	2.2	1.7
Global clearing house / exchange deposits	1.8	1.3	1.4
Restricted securities	0.3	0.3	0.5
Unclassified/other inventory/mutual funds	4.9	4.5	4.6
Other illiquid assets	2.7	2.9	3.3

- Short-term funding decreased \$7.1 billion to \$25.8 billion at August 31, 2006 driven by a \$3.0 billion decrease in commercial paper and a \$1.5 billion decrease in unsecured bank loans.
- Total long-term borrowings increased \$3.6 billion million during the quarter to \$50.2 billion as additional issuances were made in August in response to a negative cash capital position at the end of July.
- Treasury has developed a 60 day stress inflows/outflows analysis that is now a part of the risk management process at Bear. This new analysis adds a short-term cash flow stress scenario as a complement to the one-year stress analysis. This provides a detailed cash inflows and outflows analysis during the most critical part of a liquidity crisis. At September 1, 2006, the excess of inflows over outflows for the 60 day period was \$7.5 billion. This analysis will be provided to OPSRA on a monthly basis.

### Enhancements to Liquidity Risk Management

- **Increased use of secured funding** – Treasury is continuing to exploring ways to fund more assets on a secured basis rather than using unsecured short-term borrowings, possibly through repo similar to what Goldman does for a portion of its whole loan book. This would create less reliance on commercial paper (amounts outstanding would be reduced) and would result in more cash on hand that could be held at the parent company.
- **Modification to Secured Committed Bank Facilities** - In addition to keeping the three global multi-asset class facilities (US, Europe, and Asia) probably at smaller levels, in response to the growth in lending and securitization activities, Treasury is considering adding a large asset specific facility for its lending activities (residential mortgage, commercial mortgage, and auto loans) to better support these large and growing businesses.
- **Bear Stearns Bank & Trust - BSBT** (formerly CTC) – Bear Stearns has applied for a national charter from the OCC for BSBT which is expected to be approved in the next couple of months. BSBT will continue the custodial activities that were carried out by CTC as well as be used as a funding vehicle primarily for mortgage loan origination in Bear Res and EMC. Bear Res will be a subsidiary of BSBT. We will be briefed further as this develops.

### Other Notes:

A separate write-up has been prepared regarding the price verification presentation made at the meeting. Refer to the J drive.



**The Bear Stearns Companies Inc.**  
**Treasury and Financial Review - Quarter ended August 31, 2007**  
**Meeting held October 18, 2007**

**Firmwide Results:**

As with all of the CSE firms, Bear Stearns' net revenues and net income were negatively impacted by the deterioration of the credit markets that occurred in what market historians will call the "Summer of '07". The credit markets deteriorated significantly over the course of the quarter, with significant spread widening, increased volatility, decreased liquidity, and reduced price transparency reaching all parts of the capital structure. In particular, these factors adversely impacted the leveraged lending markets, hedging effectiveness, subprime mortgages including the CDO market, and other structured credit products. Some analysts will say that the failure of BSAM's two High-Grade Structured Credit Funds (one highly-leveraged) helped spark the crisis in the credit markets. In equities, losses in stat arb also contributed to lower revenues. For the third quarter of 2007 Bear Stearns reported net revenues, net income and diluted earnings per share (EPS) of \$1.3 billion, \$171 million and \$1.16, respectively. The second quarter 2007 amounts were \$2.5 billion, \$362 million and \$2.52, respectively. **Third quarter results include approximately 200 million in losses related to the failed BSAM funds, net markdowns of \$414 million in MBS, net markdowns of \$260 million on the firm's pipeline of leveraged lending commitments and CLO accumulation, and \$350 million in gains related to the valuation of the firm's structured notes portfolio.** Second quarter results included the effect of a \$227 million (\$124 million after-tax) or \$0.88 diluted per share non-cash charge related to the write-down of intangible assets representing goodwill and specialist rights of Bear Wagner Specialists. Excluding this non-cash charge second quarter net income and diluted EPS would have been \$486 million and \$3.40, respectively.

**Segment Analysis:**

	Q3/07	Q2/07	Q1/07	Q4/06	Q3/06
Capital Markets:					
Institutional Equities	719	543	513	431	471
Fixed Income	118	962	1,149	1,115	945
Investment Banking	211	357	303	364	232
<b>Total Capital Markets</b>	<b>1,048</b>	<b>1,862</b>	<b>1,965</b>	<b>1,910</b>	<b>1,648</b>
<b>Global Clearing Services</b>	<b>332</b>	<b>317</b>	<b>276</b>	<b>271</b>	<b>255</b>
Wealth Management:					
Private Client Services	148	157	136	134	128
Asset Management	(186)	184	119	113	105
<b>Total Wealth Management</b>	<b>(38)</b>	<b>341</b>	<b>255</b>	<b>247</b>	<b>233</b>
<b>Other</b>	<b>(11)</b>	<b>(8)</b>	<b>(14)</b>	<b>(15)</b>	<b>(7)</b>
<b>Net Revenues</b>	<b>1,331</b>	<b>2,512</b>	<b>2,482</b>	<b>2,413</b>	<b>2,129</b>

**Capital Markets**

**Institutional Equities:**

	Q3/07	Q2/07	Q1/07	Q4/06
Institutional Equity Sales and Trading	215	198	186	194
Structured Equity Products	72	203	161	110
Total Other Equities	432	141	166	127

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**Total Institutional Equities**                      **719**            **543**            **513**            **431**

- Institutional equity sales and trading – up \$17 million sequentially due to increased customer volumes and volatility, with international sales and trading net revenues, principally in Asia, posting the largest increase sequentially.
- Structured equity products (principally equity derivatives) – net revenues of \$72 million in the third quarter excludes \$350 million gains related to the valuation of the firm’s structured notes portfolio (driven by the widening of the firm’s credit spreads). In the financial package we reviewed the amounts were reflected in Total Other Equities. For purposes of the earnings call, these gains were included in the SEP revenues when comparing quarter to quarter performance when citing the significant increase in SEP sequentially.
- Other equities – Excluding the gains on the structured notes discussed above, down \$59 million sequentially. Arbitrage (which excludes stat arb) net revenues of \$4 million for the third quarter were \$78 million lower than the second quarter due to the deteriorating credit conditions, volatile markets, and investor doubts about M&A activity. The arbitrage desk experienced some tough days in the first half of the third quarter giving back some of its gains. Principal strategies (prop trading group) net losses of \$20 million for the third quarter were down \$48.3 million sequentially due to the much publicized losses in suffered in stat arb space in early August. Regarding the energy group, progress is being made in the development of energy operations and with the closure of the acquisition of the Williams Power portfolio on November 1, the business should being to generate additional revenues.

**Fixed Income:**

	Q3/07	Q2/07	Q1/07	Q4/06
Mortgage Backed Securities	(208)	301	230	370
Max Recovery	68	51	36	39
Credit Markets	(334)	290	418	320
Interest Rate Markets	240	77	151	132
Fixed Income Sales	170	158	140	135
Municipal/Public Finance	(86)	(12)	17	7
Principal Strategies	5	12	7	16
Other Fixed Income	263	85	150	96
<b>Total Fixed Income</b>	<b>118</b>	<b>962</b>	<b>1,149</b>	<b>1,115</b>

- Mortgage backed securities – Net losses for the third quarter of \$208 million compared to net revenues of \$301 in the second quarter. Net markdowns after hedges of \$414 million (gross markdowns of \$914 with the net synthetic positions million having a net positive markup of \$500 million). The major categories written down were (1) residential whole loans - \$106 million; (2) residential MBS - \$458 million; (3) CBO/CDO related - \$400 million; (4) commercial whole loans - \$43 million; and (5) MSR – positive \$94 million benefiting from further slowing of prepayment speeds. Subprime holdings have been reduced and progress has been made in reducing whole loan resi inventory as the firm strives to reduce risk and increase liquidity.
- Credit markets – net losses of \$334 million in the third quarter compared to net revenues of \$290 in the second quarter. Leveraged lending posted losses of \$267 million for the third quarter compared to net revenues of \$90 million in the second quarter. Markdowns, net of hedges, of \$260 million were taken on the firm’s pipeline of leveraged lending commitments and CLO accumulation. The leveraged pipeline was \$7.6 billion at August 31<sup>st</sup>. The largest open commitment was the Hilton transaction at \$4.8 billion, which closed on 10/24. Hedges (mostly HY bond index hedges) performed very poorly and did not provide much offset to the markdowns. Credit trading posted losses of \$126 million for the third quarter compared to net revenues of \$111 million in the second quarter due to the significant spread widening and increased investor concern around a higher probability of corporate defaults.
- Interest rate markets – Volatility has finally arrived in interest rate space and the CSE firms benefited greatly in this area. Record net revenues of \$240 million were achieved in the third quarter compared to \$77 million in the second quarter. Global interest rates business posted net

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revenues of \$151 million, up \$147 million sequentially, as global volatility and higher customer volumes generated record net revenues.

- Other fixed income net revenues, which consist primarily of GAAP accounting adjustments required by SFAS 133, 155 and 157, increased \$178 million sequentially due primarily to the mark to market of derivatives liabilities based on changes in the firm's own credit spreads, which widened significantly late in the quarter, pursuant to SFAS No. 157.

### **Investment Banking**

- Net revenues of \$211 million in the third quarter were \$146 million lower than the second quarter. Total underwriting (both fixed income and equity) net revenues were down \$104 million as activity declined during the quarter due to market conditions.
- M&A and advisory net revenues of \$148 million for the third quarter were up 5% sequentially due to deals in place at the end of May 2007 (Cerebus/Chrysler and Blackstone/Hilton). Obviously, given the difficult market environment, M&A and underwriting backlog at the end of the third quarter is down.
- Merchant banking posted losses for the third quarter of \$29 million compared to net revenues of \$19 million in the second quarter. Losses of the firm's investments in NY&Co. of \$50 million and ACA of 20 million were offset by a \$50 million gain on the sale of a jeans company (7 Jeans?).

### **Global Clearing Services (predominantly prime brokerage)**

- Record net revenues of \$332 million for the third quarter were \$15 million higher than second quarter 2007 net revenues. Net interest revenues were up \$12 million sequentially as average margin debits and customer short balances reached record levels (\$102.2 billion and \$102.2 billion, respectively compared to \$95.4 billion and \$101.9 billion, respectively). Quarter end margin debit and customer short balances declined sequentially due to the challenging market environment as clients delevered in August as well as a few clients moving positions to other prime brokers in early August after the August 3 conference call debacle. To put in some perspective, the controllers' people estimate that 60% of the decline in balances is attributable to Bear specific issues and 40% was attributable to general client deleveraging. Balances have been returning slowly but the firm does not expect record fourth quarter balances.

### **Wealth Management**

- Asset management – Net losses for the third quarter of \$186 million compared to net revenues of \$184 million for the second quarter. The major story here in the failure of the two high grade BSAM funds that experienced losses of \$200 million. Principal components of the losses were approximately \$125 million on the markdown of the \$1.6 billion repo collateral taken in by Bear Stearns, \$15 million related to reduced management fees and \$29 million on reduced performance fees.
- Emerging markets performance fees turned negative during the quarter (losses of \$34 million in the third quarter compared to net revenues of \$93 million in the second quarter) due to the difficult market environment.
- Principal trading (Bear's own investments in funds) posted losses of \$19 million in the third quarter compared to net revenues of \$36 million in the second quarter due to declines in alternative investment fund performance.
- Bear experienced net outflows from asset management funds as portfolio manager James O'Shaughnessy, left the firm in September to open an institutional-investing business, taking approximately \$8 billion with him. Bear had \$58 billion AUM at August 31, 2007.
- Private Client Services – Net revenues of \$148 million for the third quarter were down \$9 million sequentially due primarily to lower performance fees in Bear's emerging markets funds, which were negatively impacted by the credit market deterioration.

### **Liquidity and Funding 3rd Quarter 2007 Notes:**

- Total assets were \$397.1 billion at August 31, 2007 compared to \$423.3 billion at May 31, 2007, down 6% as the firm further managed down the balance sheet while increasing cash during the turbulent market conditions. Cash and cash equivalents increased \$7.0 billion quarter over quarter. Reverse repos, securities borrowed, customer receivables, and securities inventory decreased \$10.2 billion, \$12.0 billion, \$6.9 billion, and \$6.8 billion, respectively. Assets related to securitizations that did not qualify for sale treatment under SFAS No. 140 decreased \$9.0 billion.

- Firmwide net cash capital was \$2.8 billion at August 31, 2007 compared to \$3.2 billion at May 31, 2007 due primarily to a \$2.7 billion increase in LTD > 1 yr. (cash capital source) offset \$2.8 billion increase in cash capital requirements (firmwide haircuts).
- Less liquid and illiquid assets (defined as 100% cash capital items for Bear) were \$38.5 billion at August 31, 2007 compared to \$45.0 billion at May 31, 2007, driven principally by decreases in corporate loans and loan commitments which don't seem to make sense for the August 31 timeframe (pipeline was \$7.6 billion). I will send Bob Upton an email requesting an explanation.
- Treasury has developed a 60 day stress inflows/outflows analysis that is now a part of the risk management process at Bear. This analysis adds a short-term cash flow stress scenario as a complement to the one-year stress analysis. This provides a detailed cash inflows and outflows analysis covering the critical period of a liquidity crisis. At October 1, 2007, the excess of sources over uses at 60 days was \$10.6 billion. (see "Enhancements to Liquidity Risk Management" below).
- Bear repurchased 3.5 million shares of common stock during the third quarter of 2007 at a cost of \$495 million. Stockholders' equity at August 31, 2007 was \$13.0 billion compared to May 31, 2007 balance of \$13.3 billion.

### Enhancements to Liquidity Risk Management

- **UPDATE : Secured Funding Initiative** – The implementation of the secured funding initiative has significantly changed the liquidity and funding risk management framework at Bear Stearns. The goal was to establish a formal process to continually fund more difficult to fund assets on an ongoing basis in the secured market through a series of lending facilities thus creating less reliance on commercial paper (amounts outstanding would be reduced), increasing the liquidity ratio and provide more cash on hand that could be held at the parent company. Targets by the end of the first half of 2007 were short-term unsecured debt down to \$16 billion (50% of 11/06 amount), with commercial paper at less than \$10 billion. At May 31, 2007 CP outstanding was \$11.4 billion (a little short of the target). Treasury has been quite successful in achieving its goals even while managing through the pain of the summer. At the end of January 2007, the firm's short-term funding composition was 28% secured and 72% unsecured. At May 31, 2007 the short-term funding composition was 60% secured and 40% unsecured. At September 30, 2007 the composition was 74% secured and 26% unsecured. As of 11/1 commercial paper had declined to \$5.6 billion (a bit above the current target of \$5.0 billion) and the parent company liquidity pool was \$17.2 billion.
- **Parent Only Liquidity Pool** – As previously stated the secured funding initiative reduces reliance on commercial paper (amounts outstanding would be reduced), increases the liquidity ratio and provides more cash on hand that could be held at the parent company. As of 9/30/07 Treasury has targeted a parent only liquidity pool of \$21 billion based on coverage of various stress liquidity needs (refer to page 15 of Bear's September FLiP package saved on the J drive. Treasury continues to fine-tune the stress elements in the analysis and continues to move toward building the liquidity pool up to the targeted amount.
- **Expansion of Stress Cash Flow Analysis** – To complement the enhanced PCO liquidity ratio calculation, Treasury will be expanding the 60 day liquidity analysis to a one year comprehensive cash flow analysis to analyze the timing and the nature of cash inflows and outflows under a fully stresses environment. This will be similar in theory to the maximum cash outflow analyses done at other CSEs. Also, the analysis has been conservatively modified to only include unused committed lines as available for hypothecation. While most of the uncommitted lines will be utilized on an ongoing basis (a cornerstone of the secured funding initiative), any unused uncommitted lines will not be considered available in the one year stress liquidity analysis.

**The Bear Stearns Companies Inc.**  
**Financial Review - Quarter ended November 30, 2006**  
**Meeting held January 23, 2007**

**Firmwide Results:**

For the fourth quarter of 2006 Bear Stearns reported net revenues, net income and diluted earnings per share (EPS) of \$2.4 billion, \$563 million and \$4.00, respectively, representing record quarters for net income and diluted EPS. The comparable third quarter 2006 amounts were \$2.1 billion, \$438 million and \$3.02, respectively. Market conditions improved and customer activity increased from the downturn in the third quarter which was characterized by the seasonal summer slowdown, reduced levels of customer activity, a flattening yield curve, tighter spreads and less favorable market conditions.

**Segment Analysis:**

	Q4/06	Q3/06	Q2/06	Q1/06	Q4/05
Capital Markets:					
Institutional Equities	397	436	555	488	373
Fixed Income	1,052	878	1,167	889	838
Investment Banking	364	232	278	297	231
<b>Total Capital Markets</b>	<b>1,813</b>	<b>1,546</b>	<b>2,000</b>	<b>1,674</b>	<b>1,442</b>
<b>Global Clearing Services</b>	<b>281</b>	<b>269</b>	<b>290</b>	<b>264</b>	<b>263</b>
Wealth Management:					
Private Client Services	133	127	129	129	117
Asset Management	112	104	22	94	67
<b>Total Wealth Management</b>	<b>245</b>	<b>231</b>	<b>151</b>	<b>223</b>	<b>184</b>
<b>Other</b>	<b>75</b>	<b>83</b>	<b>59</b>	<b>24</b>	<b>(2)</b>
<b>Net Revenues</b>	<b>2,414</b>	<b>2,129</b>	<b>2,500</b>	<b>2,185</b>	<b>1,887</b>

**Capital Markets**

**Institutional Equities:**

	Q4/06	Q3/06	Q2/06	Q1/06	Q4/05
Institutional Equity Sales and Trading	194	170	202	179	161
Structured Equity Products	131	93	159	149	127
Total Other Equities	72	173	194	160	85
<b>Total Institutional Equities</b>	<b>397</b>	<b>436</b>	<b>555</b>	<b>488</b>	<b>373</b>

- Institutional equity sales and trading – up \$24 million sequentially. Net revenues from international equity sales and trading were \$9.4 million higher than the third quarter as equity markets improved in Europe and Asia and block deals contributed \$7.6 million

more net revenues than the third quarter due predominantly to gain of \$15 million on a GM block deal in November.

- Structured equity products (principally equity derivatives) – net revenues up \$38 million sequentially as market conditions improved and customer flow increased from a historically benign third quarter (seasonal slowdown).
- Other equities – down \$101 million sequentially. Net revenues for the strategic and structuring group (predominantly the commodities business) were \$114 million lower than the third quarter due principally to the third quarter sales of the Orange and Mulberry power plants in Florida that resulting in gains of \$95 million. In fact, this business posted losses of \$6.4 million in the fourth quarter due to asset write-downs. The arbitrage business posted record net revenues (\$44 million in the fourth quarter compared to \$38 million in the third quarter) as the event driven strategy benefited from increasing announced M&A activity.

### Fixed Income:

	Q4/06	Q3/06	Q2/06	Q1/06	Q4/05
<b>Fixed Income</b>					
Mortgage Backed Securities	383	312	529	397	311
Max Recovery *	39	54	44	50	
Credit Markets	355	255	262	214	150
Interest Rate Markets	134	126	171	93	149
Fixed Income Sales	135	122	130	112	131
Municipal/Public Finance	7	12	28	15	22
Other Fixed Income	(1)	(3)	3	8	76
<b>Total Fixed Income</b>	<b>1,052</b>	<b>878</b>	<b>1,167</b>	<b>889</b>	<b>839</b>

- Mortgage backed securities – up \$71 million as market conditions improved in the fourth quarter. Increased net revenues were reported across all asset classes with increased securitization and secondary market activity with the exception of fixed rate/whole loans which were negatively impacted by a \$17 million mark-down on nine Alt-A second lien residuals/NIMS due to deteriorating collateral performance. ARMs were up \$20 million to \$74 million, ABS were up \$32 million to \$89 million, CMBS were up \$30 million to \$99 million, and EMC and Bear Res were up a combined \$29 million to \$82 million as EMC and Bear Res captive origination continues to grow.
- Credit markets – up \$100 million sequentially to a record \$355 million led by record net revenues for distressed trading and leveraged finance. The notable positions in the distressed trading portfolio where gains were recognized were in aircraft and aircraft leases (particularly Northwest, Delta and American), Enron, Calpine, Adelphia and IPP positions (Macgen and Bostonside). Leveraged finance net revenues continues to increase as Bear continues to pursue and participate in larger deals both domestically and internationally including large commitments for Merck KGaA, Cablevision and Valassis Communications.

### Investment Banking:

- Net revenues of \$364 million for the fourth quarter of 2006 were \$132 million higher than the previous quarter led by increased underwriting net revenues of \$97 million.
- Equity underwriting net revenues of \$53 million were \$24 million higher than the third quarter as US IPO activity increased. Fixed income underwriting net revenues were \$30

million higher quarter to quarter (\$76 million compared to \$46 million) due to increased acquisition related financing arising from the strong M&A environment.

- M&A/Advisory fees were a strong \$140 million (up \$8 million from the third quarter) due primarily to the firm's participation in the sale of 50% of GMAC and the Verizon spin-off.
- Merchant banking – up \$25 million in the fourth quarter as the firm's investment in NY&Co. increased \$22 million. The NY&Co. investment posted losses in the third quarter of \$5 million.

### **Global Clearing Services**

- Third quarter net revenues of \$281 million were up \$11 million from the third quarter. Net interest revenues were up \$8 million sequentially as average margin debits increased to \$72.0 billion for the fourth quarter from \$68.8 billion for the third quarter. Quarter end margin debits balances were \$78.6 billion at November 30<sup>th</sup> compared to \$68.9 billion at August 31<sup>st</sup>. Commissions were up \$4 million sequentially as stock borrowing increased to cover increased customer short balances. The fourth quarter moved against the trend of declining commissions resulting from the firm using securities in the box to cover customer shorts. In the long-term the trend is expected to continue. Bear continues to generate good results from this segment as it maintains its market share domestically. The growth area is in expanding internationally and Bear Stearns is working to expand its European effort.

### **Wealth Management**

- Asset management – Net revenues up \$8 million sequentially to \$112 million. Net revenues from principal activities were \$27 billion in the fourth quarter compared to \$14 million in the third quarter due to improved performance from the firm's hedge fund investments. Net revenues from performance fees continued to be strong posting \$51 million in the fourth quarter compared to \$55 million in the third quarter driven by the continued strong performance in emerging markets over the past two quarters (\$22 million in the fourth quarter and \$33 million in the third quarter)

### **Liquidity and Funding 4th Quarter 2006 Highlights: XXX**

- Parent Company Only Liquidity Reserve – The liquidity reserve was \$6.0 billion with a borrowing value of \$5.6 billion at November 30, 2006 compared to \$6.1 billion with a borrowing value of \$5.6 billion at August 31, 2006.
- Total assets were \$349.3 billion at November 30, 2006 compared to \$334.8 billion at August 31, 2006, up 3%, due principally to a \$6.5 billion increase in securities borrowed and a \$5.2 increase in securitizations that did not qualify for sale treatment under SFAS No. 140.
- Firmwide net cash capital was negative \$187 million at the end of the fourth quarter compared to \$158 million at May 31, 2006. An increasing negative net cash capital position continued through December (reaching negative \$2.2 billion): long-term debt issuances of \$3.8 billion were made in early January. According to Bob Upton, December was not a favorable issuance month due primarily to the holiday slowdown. I am a little concerned about the length of time a negative cash capital position was carried in that Treasury should be able to anticipate when negative positions are going to occur and respond relatively quickly. In the previous meeting Bob Upton said information flow was being improved and the model was going to be updated more frequently so that these situations would come to light sooner. OPSRA will follow-up with Upton on this. At a minimum OPSRA's expectation would be that it be notified on a timely basis in such circumstances prior to seeing the numbers in the monthly submission.

- Less liquid and illiquid assets (defined as 100% cash capital items for Bear) were \$38.8 billion at November 30, 2006 compared to \$34.2 billion at August 31, 2006, driven principally by increases in corporate loans and less liquid domestic and foreign equity inventory. Significant categories of less liquid and illiquid assets are:

(in \$ billions)	11/30/06	08/31/06	05/31/06	02/28/06
Corporate loans	10.7	7.4	6.3	7.2
Distressed corporate loans included in above	1.4	1.2	1.6	1.7
Non-agency mortgages and unsecuritized product	3.7	3.4	2.6	2.9
Domestic equities	3.5	2.0	2.1	1.3
Foreign equities	2.6	2.0	1.8	1.6
Merchant banking / illiquid investments	2.5	2.2	2.4	2.3
Unfunded committed funding obligations	3.3	5.1	2.2	1.7
Global clearing house / exchange deposits	1.7	1.8	1.3	1.4
Restricted securities	0.5	0.3	0.3	0.5
Unclassified/other inventory/mutual funds	5.4	4.9	4.5	4.6
Other illiquid assets	2.4	2.7	2.9	3.3

- Short-term funding increased \$3.3 billion to \$29.1 billion at November 30, 2006 driven predominantly by a \$1.2 billion increase in commercial paper and a \$1.2 billion increase in bank loans.
- Total long-term borrowings increased \$3.0 billion million during the quarter to \$53.2 billion as additional issuances were made in November response to a negative cash capital position at the end of October.
- Treasury has developed a 60 day stress inflows/outflows analysis that is now a part of the risk management process at Bear. This new analysis adds a short-term cash flow stress scenario as a complement to the one-year stress analysis. This provides a detailed cash inflows and outflows analysis during the most critical part of a liquidity crisis. At December 1, 2006, there was a shortfall at 60 days of \$526 million that occurred in days 57-60. At the January 2, 2007, the excess of sources over uses at 60 days was \$10.2 billion due primarily to the tri-party repo structure put in place (see below).

## Enhancements to Liquidity Risk Management

- **Increased use of secured funding – US Tri-Party Equity Repo structure** – In November 2006, the firm's new products committee approved this structure to be used by Treasury as a secured funding vehicle. As previously communicated to OPSRA, Treasury is continuing to exploring ways to fund more assets on a secured basis rather than using unsecured short-term borrowings. This would create less reliance on commercial paper (amounts outstanding would be reduced), would increase the liquidity ratio and would result in more cash on hand that could be held at the parent company. The tri-party arrangement is administered by JPMC as custodial facilitating term repo activity with a series of committed lenders, each with a \$1-1.5 billion facility. A significant portion of securities in the box will be funded on an ongoing basis in the secured market. At the time of the meeting \$9.3 billion was already out at 30 days. The goal is, in relatively short order, to move to 6 and 12 month evergreen facilities. Targets by the end of the first half of 2007 are short-term unsecured debt down to \$16 billion (50% of 11/06 amount), with commercial paper at less than \$10 billion. The detailed presentation is on the J drive under Ora\BEAR STEARNS\BS\_P&L, liquidity, funding.



- **Bear Stearns Bank & Trust - BSBT** (formerly CTC) – Bear Stearns has applied for a national charter from the OCC for BSBT which is expected to be approved in the next couple of months. BSBT will continue the custodial activities that were carried out by CTC as well as be used as a funding vehicle primarily for mortgage loan origination in Bear Res and EMC. Bear Res will be a subsidiary of BSBT. We will be briefed further as this develops.

**Other Notes:**

- A separate write-up has been prepared regarding the price verification presentation made at the meeting. Refer to the J drive under Ora\BEAR STEARNS\BS\_P&L, liquidity, funding.

Bear Stearns 2nd Qtr 2006- Price Verification Update  
July 27, 2006

## Overview of Meeting

At the last quarterly meeting we were given an overview of the price verification process at BS as it was the first discussion of price verification in the Quarterly Financial/Treasury meeting format. We asked to have a update going forward as part of the quarterly meeting process with Controllers and Treasury. In addition, we asked to specifically address price verification process for credit derivatives at this meeting.

The following notes are highlights from these discussions (See presentations for more details).

### **I. 2nd Quarter 2006- Price Verification Update**

After a brief recap of the overall process at BS, we discussed the following items:

#### **A). Recap of Escalation of Price Verification Results**

Price verifiers are either RMD personnel and/or controllers depending on the complexity of the product. Most issues regarding marks are addressed between the price verifier and traders/trading management before it gets to an escalation stage and referenced in the MTM memos.

If issues still remain, price verifiers will communicate them to the appropriate members of the MTM committee for guidance. In other words, the individual risk managers/controllers will update senior committee people (like Kan, Phil, Chip, etc) prior to the committee meeting of any issues.

The price verifier for each whitebook area will prepare a monthly MTM memo to the MTM committee to highlight issues as well (we were provided a package of all the MTM committee memos for May month-end).

Finally, occasionally an issue will be escalated to the MTM Committee for the Committee itself to make the correct determination of whether an adjustment should be made. The MTM Committee has authority to mandate price adjustments.

#### **B). Quarterly Price Verification Package**

The review of the 2nd Qtr Price Verification results included looking through the following:

- (1) Sample MTM Memo

- (2) Summary of Price Verification
- (3) Scope of Coverage Summary
- (4) Items Resolved during May month-end

### Sample MTM Memo

As previously discussed a MTM memo is prepared by price verifiers for each whitebook. At this meeting, we were given the MTM memo prepared for “Credit Trading Price Verification for NY [Derivative products, HG, & HY books only] for the May month-end.

To provide some structure to the information reported up to the MTM Committee, each MTM memo must follow a standard template with 8 mandatory sections:

- (1). Highlights
- (2). Scope of Coverage- this provides the universe of the positions tested. Susan Flynn will then reconcile these positions with the books and records of the firm to confirm completeness of coverage.
- (3). Priority items
- (4). Items Verified with Low Confidence\*
- (5). Outstanding Issues
- (6). Issues Resolved or Partly resolved during the month-end process
- (7). Significant transactions impacting the MTM Valuation
- (8). Portfolio, Product or Transactions Not Reviewed

We spent a little extra time discussing section 4, Items Verified with Low Confidence, and Section 8, Portfolio, Product or Transactions Not Reviewed.

#### Section 4:

Unlike some of its peer firms, BS does not bucket positions by the method used to verify the mark on a position. For example, MS will segregate inventory whose marks are tested by value, parameter, methodology, or limited testing and provide metrics against these categories for senior management.

BS approach is much less formal. They use this section of the report to highlight (fairly qualitatively) the positions they have verified with low confidence. Generally, in this section, will want to highlight large positions for which there is a lack of data to enable price testing with high confidence. BS will label items with a high, medium, and low confidence regarding the price testing. For those with low confidence the price verifier will provide the MTM Committee details here.

#### Section 8:

This section is used to highlight if they aren’t doing any price verification on a certain area. The MTM Committee may approve this action (although generally for a certain time period).

### Summary of Price Verification Results

The Summary of Price Verification Results provides the following:

- (1) Net Cushion/exposure
- (2). Pricing Reserves (i.e. valuation adjustments)
- (3). Net exposure/cushion after reserves
- (4). Issue highlights

for each whitebook, subset of whitebooks (e.g., ARMS), or groups of similar white books (e.g., cash equity whitebooks).

A definition of certain terms as used in this report is probably helpful:

Net exposure- is basically the unadjusted aggressive difference between the traders mark and what the price verifier has obtained. This represents marks that are “too rich”.

For those few whitebooks or subsets of whitebooks that had net exposures, the exposures were either deemed to not have any material items outside the bid/offer range and thus no adjustments were made or pricing reserves were taken (e.g. credit trading and interest rate derivatives).

Net cushion- is basically the unadjusted conservative difference between the trader’s mark and what the price verifier has obtained. This represents an overly conservative mark.

During the May 2006 quarter-end, there were no adjustments taken for whitebooks which had net cushion.

Pricing Reserves- in this context, refer to adjustments to marks that come out of the MTM Committee process. All adjustments in the earlier stages of escalation are not included in this #. Some subset of those earlier adjustments from traders’ original marks may be in the individual memos prepared by the individual price verifiers for the MTM Committee.

As a result, the amount of adjustments or pricing reserves reflected on this summary maybe substantially less than the adjustments seen at other peer firms if those firms include adjustments at earlier stages in the price verification work in the statistics (another case where apples to apples comparisons across firms may not be meaningful).

Key Points about BS Summary of Price Verification Results:

- The summary provides a fairly transparent view of the net exposure/cushion for each whitebook, subset of whitebooks, or combination of smaller whitebooks, whatever the case may be.

- It gives a clear picture of the adjustments that come out of the MTM Committee process. However, the details about the magnitude of adjustments to trader’s

original marks is not available in this format (unless in the issue highlights section). One must look to the individual MTM memo's which are aggregated by Susan Flynn and distributed to all those on the MTM Committee and others (e.g., Mike Alix, Jeff Farber, Kan Ahluwalia).

- A key attribute of BS' MTM process that was made much clearer during this meeting is that unlike some of its peer firms (e.g. MS)—BS does not have “hard rules” around tolerable variances by product, whitebook, or any other cut.

While the process has some auditability, the formality around the process of when pricing reserves (adjustments) are made to marks or positions relies heavily on judgment and precise exposure/cushion limits are not defined. Variances are in affect “determined by integration and feedback” through the judgment based committee process.

From a risk perspective, the pros are that high level personnel in Controllers and the Risk Management Department are participating in this process. The cons—the auditability and controls around the process do not appear to be as formal as other firms. (I think a potential issue regarding this process may not be risk management but rather may relate to the sufficiency of controls around the recognition of P&L -considering that there are no “hard rules” around the recognition of adjustments through the MTM Committee structure. However, this is just conjecture and from the discussion it appears that the Committee's tolerances for variances are quite small (I believe they stated that as numbers approach \$1 million in net exposure they are discussed at the Committee level and that for highly transparent products (i.e. high confidence) there is little or no tolerance for net exposures.

### Scope of Coverage Summary

The granularity (by whitebook, etc) of this report mirrors that of the Summary of Price Verification results report. This report gives the following information:

- (1). Net exposure/cushion
- (2). % LMV verified
- (3). LMV
- (4). Unverified LMV Aged, > 3 months
- (5). % SMV Verified
- (6). SMV
- (7). Unverified SMV Aged, > 3 months
- (8). Comments

### Key points for the Scope of Coverage Summary:

- The firm has a high level of coverage: LMV 94.19%  
SMV 99.64%

- Any aged inventory (i.e. inventory whose marks have not been tested for > 3 months) is transparent from this report.

-For whole loan inventory- (**See Other topics-mortgages for more details**).

#### Items Resolved during May month-end

-The items listed in the packet did not seem that note-worthy (See presentation for details).

## **II. Credit Derivatives Price Verification process**

Oliver Jacobs, Head of the Credit Trading Group within RMD gave a presentation on the price testing of Credit Derivatives. See the presentation for complete details. The presentation materials and the conversation was spot on.

The discussion started with a brief overview of the instruments covered in the discussion (i.e. the instruments BS trades) and was then followed by fairly in-depth discussions about the price verification process for the most heavily traded credit derivatives: (1) single-name CDS, (2) Index CDS, (3) Index Tranches, and (4) Bespoke tranches, with most of our focus on the bespoke tranches since there is a lot of uniformity in the process for the other instruments mentioned. Oliver stated that BS has virtually no CDO<sup>2</sup> and although it has both FTD baskets and Credit Spread Options, he stated that the products are “almost dead” and the only inventory are legacy positions. As such, we did not discuss any of the specifics around the price verification of these products.

Before going into the specifics for particular instruments, there are a few key points to discuss regarding the overall price verification of Credit Derivatives at BS. First, the goal is to have 100% coverage for this product area. As seen in the Scope of Coverage Summary for the 2nd Qtr 2006- the actual coverage was quite high (100% LMV for structured and 96.30% LMV for flow (credit derivatives) and cash (corporate bonds)). Secondly, for the linear products (e.g. flow books) the firm will use linear approximations, but for the structured products (e.g. bespoke CDO tranches) the price verifiers will independently fully revalue the portfolio. Finally, in the presentation on Page 5, there is a pictorial representation of the valuation process for the various credit derivative instruments (note- the representation for the bespoke has changed –see discussion later). It gives the market inputs (that must be verified) and the modeling choices made for each instrument type.

### Single-name CDS:

Similar to its peers, BS obtains independent spread levels from Markit for every combination of Issuer, Seniority, Restructuring Provision and Maturity. Then Oliver’s group will revalue the portfolio (relying on DV01 approximations) using those independent spreads and compare the results to the traders’ marks. Any large differences are investigated by using additional sources. RMD can look at a variety of sources for

pricing including: (1) inter-market dealers such as GFI and InterCapital, (2) RMD sees the traders' quotes as well (used in the past to challenge trader's marks), and (3) quotes from LPMG and buy-side dealers. While they have a variety of sources, well over 99% of the trades are captured by Markit information. Those not covered by Markit are reviewed individually and RMD may look at proxies or Z spreads of comparable bonds.

#### Index CDS:

For recent indexes (2004-2006), the index CDS positions are revalued to the market index level (which may be higher or lower than the "theoretical" or "intrinsic" value).

For the older vintages, which have reduced liquidity, Bear participates in a dealer pll organized by Markit.

For maturities where no level is observable (< 1% of exposures), the intrinsic value is used.

#### Structured Credit:

These instruments can exhibit non-linearity and cross-gamma effects (from the interplay between spreads and correlations) in relation to single-name spreads. For these instruments, as previously stated, RMD will independently fully re-price these positions by uploading all independent spreads and independently verified correlations. This process takes 3 days to run and as such is only done on a monthly basis. However, on a much more regular basis (between 3-6 times a month), Oliver will do a DV01 check to spot check for curves that look stale.

#### Index Tranches

For liquid series, BS uses observable broker runs.

For the off-the-run series- BS essentially treats these like bespokes with mechanical mapping to the on-the-run series. However, they also participate in the off-the-run tranche surveys organized by Markit to validate their findings.

#### Bespoke Tranches

For the bespoke tranches, BS will take the independently verified (through Markit) single-name spreads (now without adjusting the spreads to tie to an index-spread). They will still adjust index product so that the total amount of the single-name spreads ties to an observable index-spread level, but now for bespokes, since they don't tie to a specific index, there are many positives, especially from the risk management perspective to just using the single-name spreads without a basis adjustment to some arbitrary index. (Also, unlike some in the industry, they also do not use one average spread for all names in a basket, as they feel this would greatly distort the true loss distribution as one bespoke may be much different than another and still have the same average spread.)

Currently, they are using the base correlations from indexes. Unlike some firms, the bespokes are not mapped to a particular benchmark index or constructed basket but rather they use a weighted-average between CDX and HY indexes. These mappings are not static, but can move, for example as names deteriorate a higher percentage of the HY index may be used in the mapping. In addition, there is an “expected loss mapping” which is basically an average spread adjustment. For example, if a 0-3 bespoke tranche had spreads twice as large as the index you are mapped to, you would map that bespoke tranche as a 0-6 index tranche in choosing an implied correlation input.

With these inputs, the bespoke is fully revalued by RMD on a monthly basis as discussed before.

This methodology is applied deal-by-deal and every bespoke has its own risk book.

For the bespoke tranches, BS submits all 24 pools to Markit for the Markit Dealer Poll. There are roughly 650 tranches in these 24 pools. BS stated that their acceptance rate was generally between 90-95% (i.e. they didn’t provide a quote that was an outlier to all the other participants in the survey). Oliver also stated that he does a report that ranks where BS is compared to all the responses for the bespoke results from the Markit dealer poll.

While they currently use the base correlations, Oliver stated that they are currently working on an “expected loss surface” approach which would be more accurate in differentiating between bespoke tranches with different spread levels.

#### Modeling issues (and reserves)

(1). Interpolation (linear vs. Quadratic)- Oliver stated that while they don’t generally run a big correlation position (which helped them last May), ever since May 2005, the stepping of base correlation curve made interpolation a bigger issue than it had previously been.

To help in this effort, BS participates in Markit’s tranchlet poll service which gives them some insight into interpolation.

As a result, they have around \$16 million at quarter end in valuation adjustments for this issue.

(2). Mapping (Inclusion of HY weighting for pools which are wider than the IG index)  
- normal bespokes are around 90% IG and 10% HY and we previously discussed that BS uses a non-static weighted average approach for mapping bespoke tranches versus mapping to an “ill-defined set of bespoke benchmarks”.

(3). Basis adjustment- the impact is small on a deal-by-deal basis and results are not conclusive but there are certain knock-on effects especially concerning risk management.



For index trades- BS will take individual single-name spread inputs and adjust to the index-spread to get rid of arbitrage opportunity (however, as discussed previously, they don't treat all individual names at a homogenous spread to the index).

They used to do this for bespoke tranches as well, but if most names aren't in the same index these basis adjustments seem arbitrary. With that said, Oliver said there is no clear sign in the market concerning which approach people are going to.

While the approach has an impact on the pricing of a position (although small), the more important impact of getting rid of this basis adjustment (and simply using the single-name spreads without adjusting arbitrarily to an index) for the bespoke trades is that it is much cleaner from the risk management perspective.

Under the previous approach, the hedging was quite messy as the basis adjustments required additional "true-up" hedging transactions" in addition to the two-step hedging process needed to flatten out risk from both a spread (through selling single-name CDS) and correlation perspective (by selling index(s) tranches). This led over time to a big portfolio of messy residual positions—the gross DV01 position has exploded over time.

Now the hedging will be much cleaner and the operational risk should be reduced since they will have a much more simplified multi-step process in the future.

(4). See Page 16 of the presentation for complete list of reserves as of 5/31/2006.

#### New Initiatives

(1). Quotevision- is a software solution to parse and organize text messages containing quotes- basically it is an artificial intelligence that allows one to much more effectively look at Bloomberg quotes (e.g. if you got a Ford 3year quote- you would have to sort through a ton of Bloomberg quotes to find what you are interested in currently). Currently, incoming Bloomberg messages have to be filtered manually from the Bloomberg message box. This should be useful mainly for the flow product, for daily checking and highlighting of quotes.

(2). Valuspread- this was a Lombard service sold to Fitch. Traditionally was only an inter-bank dealer service. Valuspread collects spread levels from major dealers and returns consensus levels-same as Markit.

If nothing else, this initiative may be used to help BS have leverage in negotiating fees with Markit. The potential benefits are also: (1) Focus on PAUG swaps (BS has traded tranches structured on a portfolio of PAUG Swaps; (2) Effort to include Off-the-run indexes in daily run (currently this is not part of Markit's daily run but just part of a monthly poll); and (3) increased coverage (data not available to buy-side, some dealers allegedly provide more data to Valuspread than to Markit (i.e. worried about hedge fund seeing their marks)).

### III. Other topics- mortgages

While not a specific topic for this quarterly meeting, we discussed the price verification process for the un-securitized, mortgage whole loans quite a bit. The discussion was topically for two reasons: (1) in discussing the Scope of Coverage Summary, whole loans (mortgages un-securitized stand out for their lack of coverage and (2) based on the issues at Rooftop concerning the poor performance of prior securitizations it seemed prudent to ask how the Rooftop inventory was currently being handled.

#### Overall process:

Whole loan inventory is not manually price verified. Rather than trying to verify loan by loan marks, they rely on their other processes such as, review of securitization spreads (have they changed reflecting a change in the value of the underlying collateral), rating agency subordination levels, aged inventory (are their loans sticking around not getting securitized), etc to make sure the current mark of the pool of loans is accurate.

Non-performing loans are treated separately. For loans that are in default or non-performing, an immediate write down occurs.

Overall, the MBS (and related whole loan inventory) whitebooks show very little P&L volatility<sup>1</sup>. Generally speaking, Phil's group will not have any adjustments to marks except for (1) write downs for non-performing/defaulted loans and (2) booking of profit when inventory is securitized. However, there are cases in which the whole loan inventory is re-marked. These cases usually are related to large shocks in the market (e.g. in 1998, BS took a \$20 million write down on its commercial mortgage inventory), changes in the rating agencies subordination levels, or when a re-pricing of product occurs in the market.

Over the past year there have been a few occurrences of such events that caused a re-pricing of the book: (1) Nov/Dec 2005- when BBB widened and other tranches tightened- they took some write downs and some write ups; (2) write ups occurred when subordination levels were adjusted favorably; (3) write ups occurred when there was a re-pricing of resi-mortgage product (we heard about this at previous monthly meetings and the 1st quarter financial overview meeting- I believe it included the ARMS product).

Overall, I think it is a fair statement to say that it takes quite a bit to change the marks on whole loan inventory. The marks are very "sticky".

#### Rooftop:

We confirmed the levels of inventory of whole loans at Rooftop (\$1.5 billion of which I believe Phil said \$1.3 was closed with another \$200k in commitments). Phil stated that

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<sup>1</sup> The interest rate risk is generally hedged for the mortgage books which helps reduce the P&L volatility of these businesses.

this number would grow as they continue to originate (this of course had Steve and myself a little puzzled since Mike Alix had stated that origination had been stopped at Rooftop).

Phil confirmed that they would probably try to do some whole loan sales. When asked specifically if there were any adjustments to the marks on the inventory, Phil said there were none yet but that they were still in the process of changing the servicer they use. I was a little surprised that given the performance of the securities, the loans were not marked down. (Did anyone else find this a little odd?).

We should continue to closely follow up this situation.

## **Bear Stearns 3rd Qtr 2007- Price Verification Update**

October 18, 2007

### **I. Overview of Meeting**

There were no special product area presentations during this quarterly review; however, during the monthly risk meeting the day before we discussed how the firm had changed its price verification approach for CDS on ABS. See Steve's write up below for this change.

The presentation was slightly different from previous quarters in that they devoted some of the package to the major markdowns during the 3<sup>rd</sup> quarter. However, there wasn't much new news here as most of these write downs were discussed in some detail at earlier monthly risk meetings and on the earnings call as well. However, they did provide some breakdown of mark-downs by the various mortgage desks/products.

There were a couple of other noteworthy points highlighted during the meeting. First, Dan Chen (new mortgage risk manager) said that they had increased the frequency of the MTM Committee meetings from bi-weekly to weekly (if not more often). Dan also said that there was "no stand off" between risk managers and the desks on price verification, but rather an iterative process where there was significantly more interaction than in more liquid markets. Secondly, with respect to the impact on the lack of liquidity in certain parts of the market, Dan said that coverage from external pricing sources for cash bonds (i.e. MBS) had become poor noting that the # of quotes are down and some of the prices appear stale. This is of course in addition to his comments about the poor results of consensus data for pricing CDS on ABS (see Section III for details).

### **II. Major mark-downs 3<sup>rd</sup> Quarter 2007:**

Total Mortgage Related Mark-downs in the 3<sup>rd</sup> qtr: (\$914 million) gross and (\$414 million) net after hedges. The net synthetic positions had a net positive mark-up of \$500 million during the quarter.

Major categories of write-downs:

- (1) Residential whole loans: (\$106 million)
- (2) Residential MBS: (\$458 million)
- (3) CBO/CDO related: (\$400 million)
- (4) Mortgage Servicing Rights: \$94 million (benefited from further slowing of prepayment speeds).
- (5) Commercial whole loans: (\$43 million)

Regarding the write down on whole loans, this is something we have rarely seen at BS and never for this significant of an amount. As discussed in previous price verification meetings, the whole loan inventory is not manually price verified and it generally takes quite a bit to change the marks on whole loan inventory.

Generally speaking, the price verifiers will not have any adjustments to marks for whole loan inventory except for (1) write downs for non-performing/defaulted loans and (2) booking of profit when inventory is securitized. However, there are cases in which the whole loan inventory is re-marked. These cases usually are related to large shocks in the market (e.g. in 1998, BS took a \$20 million write down on its commercial mortgage inventory), changes in the rating agencies subordination levels, or when a re-pricing of product occurs in the market. Obviously, there was a significant re-pricing of product during this past quarter.

Leveraged Loan Commitments and CLO Accumulation- mark downs (net of hedges) were \$260 million during the quarter. They highlighted that the hedges actually performed very poorly (mostly HY bond index hedges) and did not provide much offset to the leveraged loan positions and commitments.

They highlighted that with the exception of the Cablevision deal they assumed 100% completion of all the deals in their pipeline for purposes of taking mark-downs. As discussed in the meeting in September, they did not take a mark-down on the Cablevision commitment, which was their single largest commitment in the leverage lending space (over \$5 billion) as they did not expect the deal to be completed. Subsequent to this meeting, the Cablevision shareholders voted down the LBO.

Also, the only other significant acquisition commitment was the Hilton transaction, which was funded on October 24<sup>th</sup> (BS' portion was \$4.8 billion). At quarter-end, Bear believed that net of fees they would not take a loss on this commitment and as such did not take a write down. As of now, the syndicate group is still working with the rating agencies on the securitization efforts. We will continue to follow this situation, but were told by Mike Alix on October 25<sup>th</sup> that there may not be resolution on the rating agency action on this deal until after our monthly risk meeting in November. If all goes well with the rating agencies, the earliest these securitizations would take place is 60 days after closing due to the nature of the part of the assets being securitized (i.e. management and franchise fees, not just real estate assets, are being securitized).

### **III. Change in approach for price verifying CDS on ABS (“PAUGs”):**

Steve's write up from the monthly risk meeting where Dan Chen provided us an update:

We talked again briefly about RMD's price verification of PAUGs. Dan says they “switched” approaches in August-September, moving from a model that relied mostly on Fitch data to doing more fundamental analyses. (John S had previously said they would also do fundamental analysis on PAUGs when using the FITCH data, but Dan did not seem to see it that way). Dan described their process as 1) using internal models calibrated to the ABX and then 2) adjusting for differences in vintages, loans sizes, location, etc. (based on cash flows/performance). He emphasized the need in this market to rely upon internal analysts and their knowledge of what forces are driving prices, using

internal prepayment and loss models. He discussed numerous problems with the Fitch and Markit data, most of which we have heard before (for instance, in one month they saw something like 59% of spreads not change). Not only are there so many tranches out there (with different performances), but many of them are quite thin. He also said that Markit's inclusion of the duration did not represent an improvement over Fitch, because the products can be so convex (he would rather just see a price posted).

Just to add: Dan felt the use of consensus pricing was generally a good approach in tight markets but was not sufficient in the current illiquid markets where there is so much variance in prices provided by participants.

#### **IV. Other Price Adjustments- 3<sup>rd</sup> Quarter 2007**

There were 7 different price adjustments highlighted for the 3<sup>rd</sup> quarter. None of these pricing adjustments were very material- the largest being a \$7 million write down. They ranged the spectrum with respect to business area: IR swaps, Credit, equity derivatives, distressed, leverage finance, and MBS.

The largest adjustment was the \$7 million write down on the NY Fixed Income- Interest Rate Derivatives desk which was the result of the desk re-marking of the volatility skew for U.S. interest rate swaps in response to Risk's valuation analysis.

(See presentation for details.)

#### **V. Changes to major pricing reserves:**

Most of the major pricing reserves are credit trading related (structured book, VOX Capital, and the flow books). In addition, there were small changes to reserves for NY Fixed Income Derivatives (European options) and SEP-NY (SPX volatility) which were just the result of very small differences on very large books. Both of these pricing reserves have consistently been on this report.

In the Credit area, I would highlight the following:

(1). Similar in vein to the Fixed Income Desk and SEP above, the High Grade and HY flow desk in Credit Trading had a \$6 million increase in its pricing reserve due to increased exposure to high yield swaps and "off the run" indices where there are large positions with small spread differences. Chip said that the reserve basically represents a couple of basis point adjustment across a large portfolio.

(2). In the structured credit space is where the firm has the largest "cushions". First, on the structured desk, a \$5 million reserve was released during the 3<sup>rd</sup> quarter. By August month-end, the structured desk had a cushion of \$30 million when compared to Markit consensus data as BS' model marked a short bespoke position in the junior mezz space tighter than Markit. Risk management believes that their "high definition" measure,

which shows a \$4 million exposure at qtr-end, is a better approximation at month end. However, given the large cushion provided by the Markit consensus prices, the firm released the previously booked reserve of \$5 million.

◦ Chip said that Oliver had been refining the methodology referred to here as “high definition” measure for tranchlets (for example 3-5%, 5-7%). ***We should follow up at the next quarterly meeting on this approach to see how it compares to what was presented previously. It is on these tranchlets that the firm had previously had significant collateral disputes.***

The same issue was present in VOX Capital (the firm’s prop structured credit desk). In this case they reduced the previous reserve from \$18 million to \$10 million in August as the marks from Markit consensus data resulted in \$8 million of cushion. Again, risk management believes that using their model would generate an exposure (in this case \$12 million), but given the cushion to consensus data (and also due to some offsetting trades which mitigated the index tranchlets exposure) they felt they needed to reduce some of the previously booked reserve.

In total, between the structured and VoX desk, Credit Trading has \$48 million of cushion (after reserves) to Markit consensus data for tranchlet and bespoke related positions.

#### **VI. Summary of Price Verification Results @ 8/31/07:**

The pricing reserves increased from a previous high water mark of \$30.5 million to \$38.5 million. At the second quarter they noted how high the pricing reserves had gotten and that they expected to get to a position of marking position by position adjustments vs. a portfolio level review in the future; however, given the illiquidity in the market I guess this was unattainable. ***Follow up on the level of pricing reserves at the next meeting if they continue at this alleviated range (although fairly immaterial overall).***

The net cushion (after pricing reserves) decreased from \$52.4 million to \$42.3 million at the end of the 3<sup>rd</sup> quarter. Again, the net cushion/exposure amount is where the firms do not have strong enough evidence to adjust prices (BS does not have pre-determined tolerance levels- each decision is judgment based).

Chip also highlighted that for the distressed and leverage finance (not commitments but actual positions) whitebooks the pricing was much more skewed towards “relative value analysis than from observation of direct price quotes” this quarter. In the 2<sup>nd</sup> quarter, they had 65% coverage from broker quotes and 35% through relative value analysis but in the 3<sup>rd</sup> quarter these amounts have flipped around (65% from relative value analysis).

#### **V. Scope of Coverage @ 8/31/07:**

The price testing of inventory for the month of August was at a high level (94.3% of Long MV and 98.6% of Short MV). Distressed and Leverage Finance coverage during August

were much higher than during the second quarter as one would expect (up from the 60-70% range to 95%-99% respectively). In contrast, the scope of some very small mortgage desks (CBO and special situation) was down.

During the 2<sup>nd</sup> quarter we asked to be provided with an overview of how the MTM Committee was made comfortable that over a 3-month period (during the quarter) that 100% coverage was attained. The report that is included in the quarterly package to us is only the end of the quarter month. ***We should consider whether we should ask for a report that shows the full price verification work done throughout the qtr to meet the 100% coverage goal.***



## **Bear Stearns 4th Qtr 2006- Price Verification Update**

January 23, 2006

### **I. Overview of Meeting**

There was no special product area presentation during this quarterly review. Previous quarterly updates included specific presentations on the price verification role for particular product areas (e.g., Credit Derivatives in 2<sup>nd</sup> Qtr; Mortgage Residuals in 3<sup>rd</sup> Qtr). We highlighted for Chip that we would probably be requesting a specific product area to drill down into at the next quarterly meeting (perhaps, Fixed Income Derivatives- an area we have not focused on very much in the past). With that said, during the monthly risk meeting in January James Bell gave an update on Equity Risk Management, which included some particular price verification examples within the Equity exotic product area (see monthly write up and presentation for details).

This month the quarterly update was given by Chip Steppacher (typically runs this discussion with input by RMD risk managers on specific areas) and Cindy Luzcando (who has recently taken over Susan Flynn's role). Phil Lombardo was in attendance to talk to some of the mortgage related adjustments and Kan dialed in to give details on some of the derivative items. Jeff Farber also sat in on the discussion and gave some input on the overall level of net cushion.

During the quarterly update, the firm discussed the usual areas/reports: (1) Significant Price Adjustments-4<sup>th</sup> quarter; (2) Major Pricing Reserves; (3) Summary of Price Verification Results (including net exposure/cushion by whitebook); and (4) Scope of Coverage Summary. Overall, there was not much new information discussed during this meeting as Kan and others had highlighted many of these items during our previous monthly risk meetings.

### **II. Significant Price Adjustments-4<sup>th</sup> Quarter 2006:**

First, Chip noted that there were no pricing issues identified in November (at the MTM committee level) and that this was at least partially due to the fact that BUC/RMD had done a lot of deep dives into various areas earlier in the quarter, particularly in October.

Many of the price adjustments (and reserves booked) that were made during the quarter were discussed previously during our monthly risk meetings with Kan. As such, this meeting served more as a recap, than the presentation of new material (perhaps a good by-product of Kan's efforts during the monthly meetings).

The sum of the significant price adjustments highlighted for the quarter was rather small, around \$30 million in gross adjustments. The largest adjustment during the quarter was a \$17.4 million mark-down of Alt-A second-lien residuals/NIMS during October. In percentage terms, the mark-down was significant as the \$17.4 million was off a previous MV of \$103 million for these specific residuals. The need for the mark down was necessitated by delinquency rates doubling on the collateral pool underlying these

securities as well as a result of new trading on these pools occurring at lower levels. *(During the 3<sup>rd</sup> quarter price verification update, Phil had highlighted that the delinquency rates on 2005-2006 vintage Alt-A (second-lien) product had increased significantly and that it would probably result in a mark down.)*

We asked Phil if there were any other areas of concern currently and he stated that he had only seen this level of deterioration in second lien residuals (in both Alt-A and Subprime). He also said that his group looked at resides of Secure Option-ARM and Option-ARM deals during November and had no adjustments. He said the reviews showed an average total cushion of \$3-4 million. He also stated that there was not much trading in this area (I take it that the Option-ARM (and Alt-A) portion of the residual pie is still increasing; while based on previous conversations (see below) the subprime piece of the pie is shrinking. ***It is probably worth getting an update on mortgage resides positions prior to looking at capital charges holistically (to make sure the data from a few months ago isn't too stale).***

Mike Alix noted the following during our monthly meeting in December (taken from the November 2006 write up):

The CRO discussed the growing deterioration in subprime mortgage performance. He said delinquency rates have recently doubled for some pools of loan, climbing from the 1-2% range to the 3-6% range. Although, some deals have performed much better than others. There has also been some diminishing performance in some Alt A product as well, but not to the same extent as with subprime.

Mike feels Bear has done a good job adjusting against aggressive underwriting over time. He noted that in 2005 Bear securitized (as principal) \$17 billion in subprime product, versus \$7 billion in 2006. He seemed to be attributing much of this decrease to the business decreasing the price for which it is willing to pay for loans from particular originators, as well as to a strategy of focusing more on Alt A and Option Arm product.

Also, as was discussed in the September memo, subprime residuals have increasingly comprised a smaller portion of Bear's total residual position (an Option Arms more), partly due to Bear's use of the Silverton funds to forward sell these resides. This month Mike mentioned that Silverton has helped Bear distribute 75% of its subprime residuals.

(I guess we will see if there are further mark-downs in the 1<sup>st</sup> quarter or if the marks were already adjusted.)

Outside of the mortgage residual area and a couple of other minor adjustments, most of the adjustments were to eliminate slight biases in trader marks to the consensus data in Totem/Markit Partners (e.g., IRD and Credit Trading).

### **III. Major Pricing Reserves -4<sup>th</sup> Quarter 2006:**

The changes in pricing reserves highlighted in the price verification package had a common theme: they related to traders' marks bias to Markit Partners consensus data (across Equity Derivatives, Credit Trading, and Interest Rate Derivatives):

- 1). SEP- Index pricing reserve decreased from \$2 to \$1 million as the Totem underliers were re-priced. This is a tiny adjustment for a small bias across the index books.
- 2). Credit Trading-NY- (High Grade Credit) - decreased the pricing reserve from \$4.4 to \$4 million on a small number of off-the-run index positions. The bias was around ½ of a basis point. Jeff Farber stated that in the past, the reserve was much higher, in the \$15 million range, and at that level, he felt like the MTM committee was pricing the book. He stated that since then, the traders have been marking this much closer to Markit Partners' consensus data.
- 3). Credit Trading VOX (the firm's prop structured credit desk which tries to arbitrage between dealer prices) - a benchmarking exercise between the VOX portfolio and the results from Markit produced an exposure of \$11 million. A reserve increase of \$6 million was taken, resulting in an \$8 million reserve for the portfolio. At the end of the day, this reserve was booked as a model reserve not a pricing reserve and as such was not shown on the Summary of Price Verification Results pricing reserve schedule.

The exposure was generated because the desk was pricing 7-10 year Mezz tranches at higher spreads than the Markit consensus. This issue was discussed in detail in our meeting in December:

In addition, the VOX desk, which attempts to arbitrage between dealer prices, lost \$6 million. November was the desk's worst month in terms of its performance in the Markit partners bespoke tranche survey/service. The desk was pricing 7-10 year Mezz tranches at higher spreads than the Markit consensus. Following the first survey, Markit did a second one and the desk improved considerably on the 10 year spreads, but not on the 7 year spreads. However, the Markit results present a challenge to risk managers/price verifiers, because Bear can often be printing trades with dealers at different levels than the Markit consensus. One possible explanation for such discrepancies is that Markit now has 20-30 contributors to its survey, but risk managers feel there are really only 6-10 players (dealers) in the market.

They did not book the entire exposure as they do not have total confidence in the Markit survey for this area (as stated above) given that they can get broker quotes and can execute at different levels. Kan stated that they remain in dialogue with Markit Partners regarding these survey results. He said that the problem may be: (1) the number of contributors is > than the number of real players in the market (as stated above) or (2) the submission process isn't totally accurate (i.e. bespoke CDO tranches is an area where there are generally reserves booked and if these reserves are not taken into account this

could explain the disconnect in the prices being submitted to Markit and what they see in broker quotes, etc).

NY FI Derivatives- volatility skew differences in the 10yr and 2 yr swap tenors led to an increase of the reserve by \$2.5 million to \$6 million.

Kan stated that the desk (NY swaptions, caps, floors) tends to show a consistent bias against the Markit Partners consensus. The bias is small but across a large set of trades it adds up. Kan stated that they are in ongoing discussions with the desk regarding this reserve. The MTM Committee decided to, absent direct contradictory information, reserve 100% of the difference between the marks and Markit consensus data.

As a sidebar, Kan seemed to express some concern about the performance of the NY FID flow trader in general (an area for follow-up given the lackluster performance of this desk for much of 2006).

#### **IV. Summary of Price Verification Results @ 11/30/06:**

The net cushion increased from \$47.8 million to \$62.8 million at the end of the 4<sup>th</sup> quarter. Jeff Farber noted that this still represented a very small amount given the roughly \$75 billion long inventory. Again, the net cushion/exposure amount is where the firms do not have strong enough evidence to adjust prices (BS does not have pre-determined tolerance levels- each decision is judgment based).

The pricing reserves increased slightly to \$11 million resulting in Net Cushion after reserves of \$73.8 million. The largest net cushion after reserves relate to MBS (\$26.7 million- up \$12 million, driven primarily by ARMs (where they generally have less confidence in the models (i.e. option-arms)); Credit Trading (\$11.989 million of which \$9.5 million relates to HY book; Distressed (\$16 million- all cushions where verification is with low confidence); Leverage Finance (\$13.3 million; down from earlier quarters).

#### **V. Scope of Coverage @ 11/30/06:**

The price testing of inventory during the 4<sup>th</sup> qtr was consistent with prior quarters and no major changes from the 3<sup>rd</sup> qtr.

The MBS related whitebooks: Long MV 94.87% verified (94.11% last quarter). The whitebooks with the most unverified inventory at quarter-end were the same as last quarter (The SMV% verified stood at 100%):

Non-Agency CMOs- %LMV verified (79.13%). Monthly unverified LMV is due to various non-agency NIMS, residuals, IOs, and subordinates (including CDO accumulation).

ARMs- % LMV verified (84.58%). Monthly unverified LMV is due to various non-agency NIMS, residuals, IOs, and subordinates.

CBO Desk- % LMV verified (14.74%). \$551 million of unverified is spread across several accumulation books which are revalued when and if they become 180 days aged. (Obviously, they are relying on turnover for this desk; and verify if this assumption does not hold true (i.e. inventory becomes aged).

In talking with Phil, he stated that they do some rotating of products/positions that they price verify each month. I asked how that translates to coverage of mortgage residuals and he stated that “the general rule is that all residual positions should be price verified once a quarter... but this is a bit of a challenge”. He also stated that they have lost one resource in their group that did a lot of the reconciliation work, which has made the process more challenging recently.

For the other cash oriented inventory including (unsecuritized mortgages; cash equity whitebooks, interest related whitebooks, credit related whitebooks), the total LMV verified was 87.50%. SMV% verified stood at 100%.

There were two points worthy of mentioning:

Unsecuritized mortgages- the % of LMV verified for this inventory type is always low (18.89% at end of 4<sup>th</sup> qtr). As Phil discussed in some detail during our 1<sup>st</sup> price verification meeting (2<sup>nd</sup> qtr 2006), whole loan inventory is not generally price verified. See 2<sup>nd</sup> qtr 2006 write up for more detail.

The comments section for this inventory states:

Whole loan inventory is not manually price verified. Comfort with the valuations comes from model reviews, high velocity of turnover, monthly reviews of non-performing static loans pools, analysis of aged loans and daily review of large P&L items.

Other whitebooks- This group includes firm inventory in asset management, global clearing services, and PCS. The total amount is obviously very low (\$16 million) and is virtually all unverified (LMV verified is 1.34%).

The final category of whitebooks (those not utilizing XPOS system/process) are the derivative products (credit trading, SEP, Interest Rate Derivatives) and the Distressed and Leverage Finance desk. For these products, the LMV % verified was 98.04% and SMV % verified was 98.59%, just slightly down from prior quarter figures.

The total %LMV verified for the firm stood at 94.33% and %SMV verifies stood at 98.93% at the end of the 4<sup>th</sup> qtr.

**Bear Stearns- Price Verification of Alt-A RMBS and Floating rate CMBS  
02/26/08**

BS personnel:

Dan Chen  
Maura  
Felix

SEC personnel:

Tom O'Dougherty  
Jim Giles  
Kevin Silva  
Jay Sood  
Steve Spurry  
P.C. Venkatesh

As a follow up to the monthly risk meeting in January, we requested to have a separate call to walk through some real examples of price verification for Alt-A RMBS positions as well as for the floating rate CMBS positions. We picked these two areas because BS has significant exposure to both products and the price verification is a challenge for both areas now.

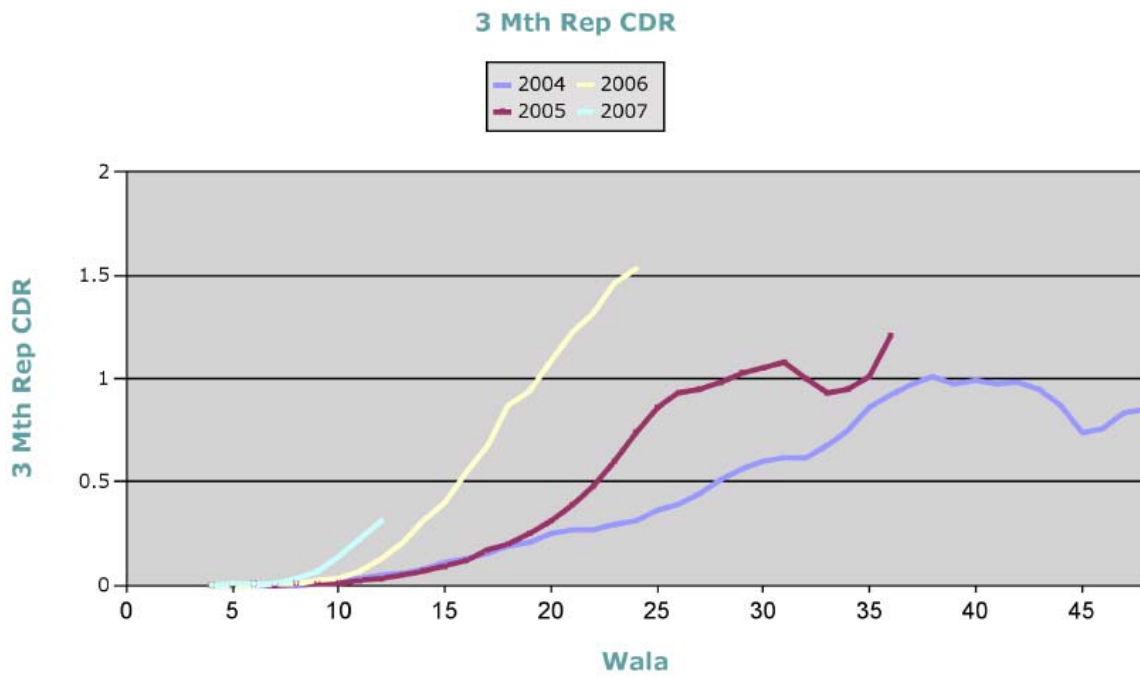
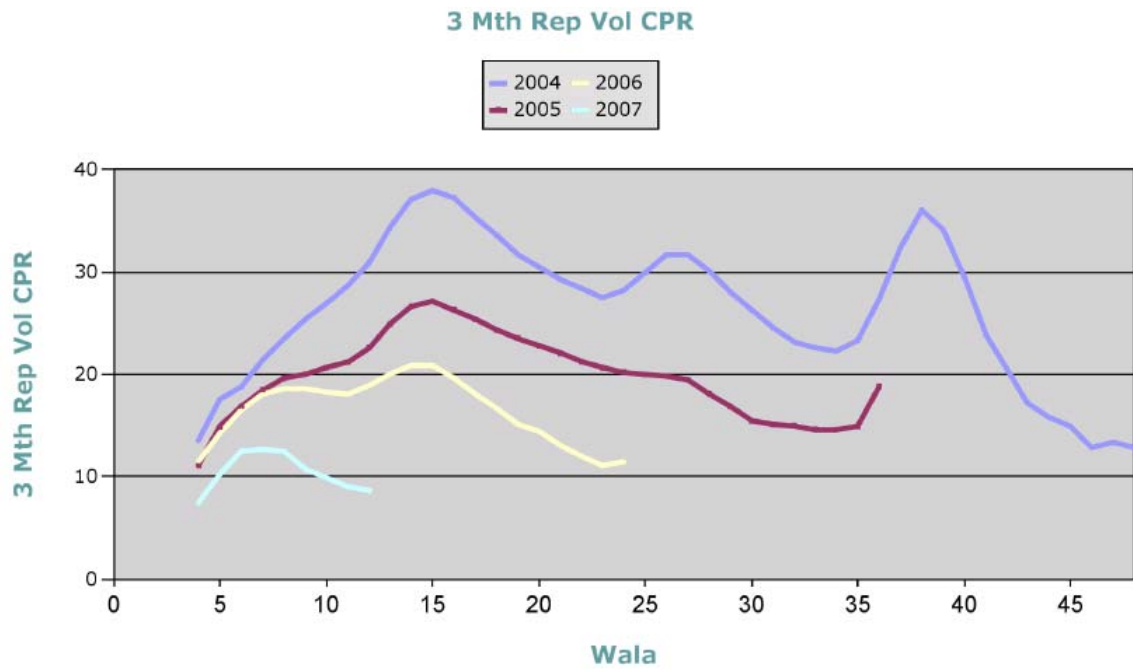
**I. Alt-A RMBS (and loans):**

Generally speaking, the price verification approach is a fundamental cash flow approach as there is very little trading activity and a lack of an index to benchmark to (i.e. no ABX equivalent for Alt-A product).

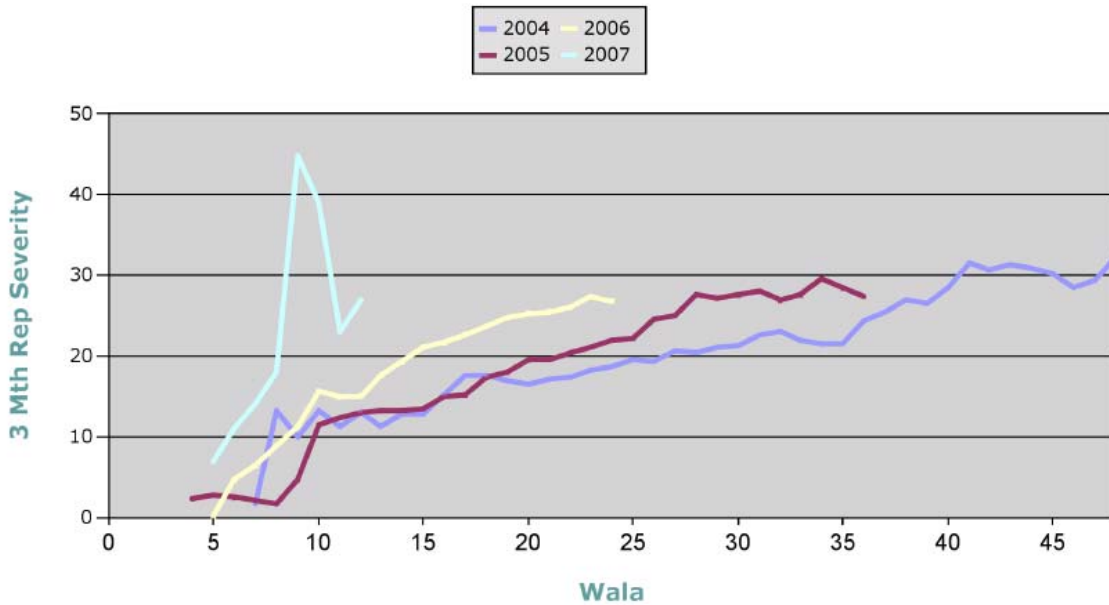
Felix (who works for Dan on the Alt-A RMBS product) walked us through an example of how he would do price verification for a hybrid-ARM, ALT-A deal.

First, he starts his price verification duties by looking at the trends in performance metrics (constant prepayment rate (CPR); Constant Default Rate (CDR); severity; 60+ day delinquent (including FCL and REO)) for the hybrid-ARM, Alt-A product. This data comes from FAST research database which tracks actual performance across many different shelves (not just BS shelves but also DB, ML, and others) for 2004, 2005, 2006, and 2007 vintages. Obviously the trends show that CDR, severity, and 60+ day delinquent metrics are worse for the most recent vintages (i.e., 2007 and 2006 substantially worse than 2004 and 2005) which reflect the decrease in underwriting standards and the higher LTVs for the recent vintages. Also, the remittance data has shown acceleration in delinquencies and defaults over the past few months. As a result, the expected cumulative losses have increased significantly since the last quarter-end.

See the trend graphs below for trends in CPR, CDR, and Severity for the 2004, 2005, 2006, and 2007 vintages.



### 3 Mth Rep Severity



Once he has looked at the overall trend analysis of the performance metrics for the product, he turns to the individual deal. He will look at many of the static deal information including: Weighted Average life (WALA); loan to value (LTV); cumulative loan to value- including 2<sup>nd</sup> lien (CLTV); %CLTV >= 100 (i.e. where the loan is under-water), etc; % LTD doc (limited doc); Penalty%, etc. He then looks at the actual performance data for the deal. Again, this is updated each month once the remittance data comes in. For the deal we were looking at (BALTA-0604C) a July 2006 5-year hybrid-ARM, the performance data showed a significant increase in the 60+ delinquent bucket over the past couple of months as well as a jump in the Foreclosure and Real Estate Owned buckets. This information (the actual performance data on the deal and the trend) will tell them what they can expect to default over the short-term.

#### BALTA-0604C

##### Loan Type : ALL

Factor Month	Curr Bal (\$MM)	Factor	% Fix	GWAC	WALA	% Curr	% Always Curr	% 30 Days Dq	% 60+ Days Dq	60+ Days Dq		% Fcl	Foreclosure		% REO	Total 1-Mo CPR	Implied			Reported					
										% Perf	% Non-Perf		% Perf	% Non-Perf			Vol 1-Mo CPR	1-Mo CDR	Cum Default (bp)	Vol 1-Mo CPR	1-Mo CDR	Cum Default (bp)	Cum Loss (bp)	Severity	
Jul-06	1150.6	0.99	0	6.60	3	99.93	99.93	0.07	0.00	0.00	0.00	0.00	0.00	0.00	6.90	6.90	0.00	0.0	6.90	0.00	0.0	0.0	0.0	0.0	
Aug-06	1143.8	0.99	0	6.60	4	99.57	99.55	0.38	0.04	0.00	100.00	0.00	0.00	0.00	6.74	6.74	0.00	0.0	6.74	0.00	0.0	0.0	0.0	0.0	
Sep-06	1126.6	0.97	0	6.59	5	99.40	99.28	0.37	0.23	0.00	100.00	0.00	0.00	0.00	16.52	16.52	0.00	0.0	16.52	0.00	0.0	0.0	0.0	0.0	
Oct-06	1116.4	0.96	0	6.59	6	99.06	98.85	0.55	0.37	0.00	100.00	0.02	0.00	100.00	10.28	10.28	0.00	0.0	10.28	0.00	0.0	0.0	0.0	0.0	
Nov-06	1102.3	0.95	0	6.59	7	98.34	98.10	0.94	0.55	0.00	100.00	0.17	0.00	100.00	14.01	14.01	0.00	0.0	14.01	0.00	0.0	0.0	0.0	0.0	
Dec-06	1090.6	0.94	0	6.58	8	97.77	97.29	1.05	0.85	0.00	100.00	0.33	0.00	100.00	11.99	11.99	0.00	0.0	11.99	0.00	0.0	0.0	0.0	0.0	
Jan-07	1074.3	0.93	0	6.58	9	97.32	96.92	0.91	0.65	6.62	93.38	1.12	0.00	100.00	16.43	16.29	0.17	1.3	16.43	0.00	0.0	0.0	0.0	0.0	
Feb-07	1050.0	0.91	0	6.57	10	97.20	96.44	0.66	0.73	17.41	82.59	1.40	0.00	100.00	0.00	23.92	23.92	0.00	1.3	23.92	0.00	0.0	0.0	0.0	0.0
Mar-07	1036.7	0.90	0	6.57	11	96.58	95.71	0.99	0.63	8.62	91.38	1.82	0.00	100.00	14.10	13.72	0.43	4.6	14.10	0.00	0.0	0.0	0.0	0.0	
Apr-07	1021.0	0.88	0	6.57	12	96.51	95.42	0.88	0.74	8.53	91.47	1.60	0.00	100.00	0.26	16.61	16.61	0.00	4.6	16.61	0.00	0.0	0.0	0.0	0.0
May-07	995.1	0.86	0	6.56	13	95.81	94.82	1.22	0.89	16.95	83.05	1.53	0.00	100.00	0.56	26.49	25.28	1.59	16.3	26.49	0.00	0.0	0.0	0.0	0.0
Jun-07	961.0	0.83	0	6.56	14	95.56	94.23	0.94	1.27	8.86	91.14	1.48	1.05	98.95	0.75	34.14	33.87	0.39	19.1	34.14	0.00	0.0	0.0	0.0	0.0
Jul-07	948.3	0.82	0	6.55	15	94.35	93.18	1.50	1.36	8.15	91.85	1.89	0.93	99.07	0.90	14.65	14.31	0.39	21.8	14.31	0.39	2.7	-0.1	-2.1	
Aug-07	938.0	0.81	0	6.55	16	93.40	92.11	1.62	1.44	12.45	87.55	2.29	2.70	97.30	1.26	12.24	12.24	0.00	21.8	12.24	0.00	2.7	-0.1	0.0	
Sep-07	925.2	0.80	0	6.55	17	92.54	90.82	1.96	1.29	18.91	81.09	2.79	1.79	98.21	1.43	15.03	13.76	1.46	31.8	13.76	1.46	12.6	1.2	13.1	
Oct-07	916.5	0.79	0	6.55	18	91.54	89.60	1.92	1.94	15.20	84.80	3.13	1.06	98.94	1.47	10.73	9.27	1.59	42.4	9.27	1.59	23.3	4.6	31.5	
Nov-07	909.0	0.79	0	6.54	19	89.94	88.09	2.68	2.67	11.93	88.07	2.77	0.00	100.00	1.93	9.19	7.22	2.11	56.5	7.22	2.11	37.3	9.1	32.1	
Dec-07	904.1	0.78	0	6.54	20	88.67	86.56	2.35	3.70	9.96	90.02	3.13	0.00	100.00	2.15	6.28	6.03	0.26	58.1	6.03	0.26	39.0	9.1	1.3	
Jan-08	897.0	0.77	0	6.54	21	86.83	84.72	2.57	4.89	11.37	88.63	3.68	0.00	100.00	2.22	8.91	7.99	1.43	67.5	7.98	1.01	45.6	11.5	35.9	

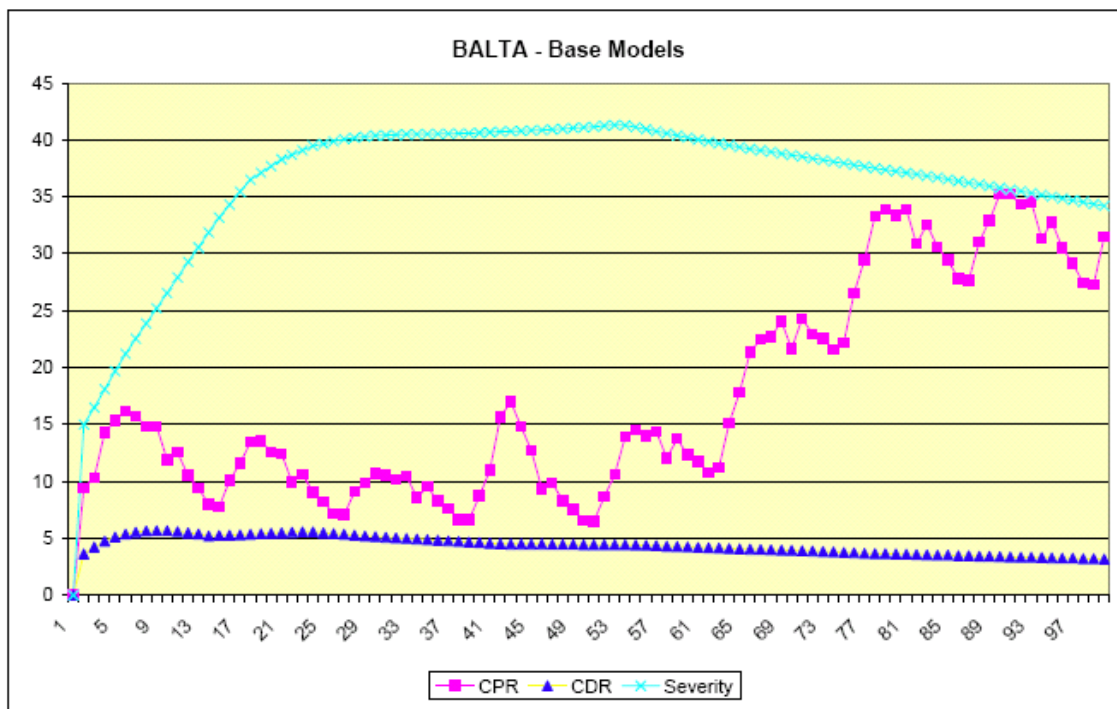
The above is part of the performance table for the specific Alt-A security being price verified. You can see the recent increase in 60+ day delinquency, FCL, and REO.



Once he has looked at the performance trends for the product space and the actual performance to-date on the deal being priced verified, he will run FAST's model on the deal. Actually, the model is a forecasting model that projects the default curves (CDR), CPR, and Severity on a loan-by-loan basis. The major driver of these factors is the Home Price Appreciation ("HPA"). Their model uses HPA calibrated to the OFHEO data (on Freddie and Fannie guaranteed loans) and then regressed back to the MSA level and projected forward. The model on average is showing a -4% HPA for each of the next two years followed by a small + HPA for the next few years thereafter. For some individual Metropolitan Statistical Areas, the -HPA can be up to -10% for each of the next two years (e.g., Riverside, CA).

It is important to highlight that within the model, for the short-term (over the next two years) they do what is called "flushing the pipeline". This basically takes everything in FCL and REO and a high percentage of what is in the 60+day delinquent bucket and considers it all defaulted and spread over the next year (I believe the FCL and REO is spread over the next 6 months). From that point on, the cumulative losses are based on the projections that come out of the model.

In this case, the projected CPR, CDR, and Severity curves that came out of the model were reasonable to him when compared to the actual performance data he was seeing on the deal. As such, he did not adjust the model.



*The above are the CPR, CDR, and Severity that is coming from the running of the base model. The y-axis is the % and the x-axis is the WALA (in months) of the security starting with the current month plus 1 (in this deal the 22<sup>nd</sup> month of the deal).*

Current run of the base model on BALTA-0604C

	HPA Scenario	Home Price Model				
	Losses	100 EDM, Model Sev				
	Prepay	FMR EPM				
	Prepay Model	Test NearPrime Model				
	Yield	Price	Market Value	% Loss	% Prin Returned	
Yield 12.00	12.00	19.322	3,896,514	7.392	1.146	
Yield 13.00	13.00	18.978	3,829,024	7.392	1.146	
Yield 14.00	14.00	18.644	3,763,478	7.392	1.146	
Yield 15.00	15.00	18.320	3,699,804	7.392	1.146	
Yield 16.00	16.00	18.005	3,637,934	7.392	1.146	
Yield 17.00	17.00	17.699	3,577,803	7.392	1.146	
Yield 18.00	18.00	17.401	3,519,349	7.392	1.146	
Yield 19.00	19.00	17.111	3,462,512	7.392	1.146	
Yield 20.00	20.00	16.830	3,407,233	7.392	1.146	

*The above table shows the cumulative losses and prices from the most recent run of the “base model” across a range of discount rates. As stated above, Felix viewed the model results of CPR, CDR, and severity that came out of the model to be reasonable in light of the actual performance data on the deal. As such, the above table will be used to price verify the deal.*

In this particular example, the results from the current running of the base model resulted in a 7.392% cumulative loss. This loss is reflective of the deterioration in the actual performance and any further deterioration in HPA assumptions build into the model. The securities cash flows (defined by the prepayment model and default model) are then discounted back at various discount rates (i.e. yields) (in this case between 12-20%) to get a range of prices. Pricing this security based on the 7.392 cumulative loss using discount rates ranged from 12-20%, resulted in prices mainly in the 17-18% range.

In this case the prices are not that different across the various discount rates due to the fact that as the cumulative loss has risen, the losses have reached a level that the only expected future cash flows for this tranche (BBB-) would be the next several coupon payments. With such a short expected duration, the discount rate assumption is not nearly as critical. (When this security was being valued based on a lower expected cumulative loss (i.e. at November 30, 2007), the sensitivity to the choice of discount rate was much greater.)

This would not be the case for the higher rated tranches that still would expect to have a much more significant duration. For these tranches, particularly AAA and AA, that are more sensitive to the discount rate used, Bear will look to market transactions to determine a reasonable range of yields to use to discount the cash flows. ***Would be a good idea to get more specifics in this area (e.g. how far down the capital structure are there observable market quotes?)***

Current run of the Model with Adjustments made to the Economic Default Model (EDM) on BALTA-0604C

Yield	Price	Market Value	% Loss	% Prin Returned
12.00	49.988	9,917,400	4.725	54.364
13.00	47.190	9,367,985	4.725	54.364
14.00	44.638	8,867,050	4.725	54.364
15.00	42.307	8,409,377	4.725	54.364
16.00	40.173	7,990,381	4.725	54.364
17.00	38.216	7,606,030	4.725	54.364
18.00	36.416	7,252,765	4.725	54.364
19.00	34.759	6,927,446	4.725	54.364
20.00	33.231	6,627,293	4.725	54.364

*The above table is a result of the model being run at 80% of the Expected Default Model with 75% of the Modeled Severity. It is closer to where the position was marked for books and records at November 2007 year-end.*

This would be an example of risk tailoring the base model or applying “model haircuts” to the base model. This is generally done when the base model projections differ substantially from what risk sees in the actual performance data. In this particular case, they did not use this adjusted model as they felt the base model’s projections were in line with the trend in recent remittance data.

After all this analysis has been done, Felix then uses these prices to compare to what the traders have marked the positions at. In this particular example, the traders currently hold this tranche at the higher 30-40s level and it will need to come down into the high teens at quarter-end. (Dan basically said that the losses in mortgages through January we discussed at the monthly meeting are not reflective of this most recent remittance data and that they expect to take “a lot of pain” in this area at quarter-end.)

While they use the same approach discussed above for all the Alt-A inventory, some of the product types (e.g. Option Arms) will be even more challenging based on lack of historical information on how they will perform (for example-after resets). For these areas, Felix may have higher amounts of adjustments to the “base model” to calibrate to what he is seeing in the remittance data.

## II. Floating Rate Commercial Loans:

We focused our discussion on the floating rate commercial loan product for 2 reasons. First, the vast majority of BS commercial loan/CMBS inventory is in floating rate commercial loans, including the large Hilton deal. Secondly, unlike the Fixed Rate CMBS product, they are no longer able to mark to a securitization exit for this product as no transactions have occurred since October 2007 in that market. (In contrast, they just printed a Fixed rate deal (TOP-29) in which they sold most of the securitization. They have subsequently market the remaining fixed rate loans to this deal exit through the traditional mock securitization approach.)

The current price verification approach for the floating rate commercial loans starts by looking to pieces of these loans that they have been able to either sell or circle with customers. To date, this customer activity has occurred in the lower parts of the capital structure (i.e. the mezz portions).

They walked us through the example of how the price verified a Mezz D loan from an Extended Stay Hotel deal. The loan attached at an LTV of 64% and detached at an LTV of 69% and the desk had it marked to a spread of 650 basis points. As discussed before, there was no recent external market data to price the loan and they hadn't circled or sold any portion of this loan. As a result, they compared this loan to another floating rate deal with similar attachment points, the 2<sup>nd</sup> and 3<sup>rd</sup> loss Mezz tranches of the Hilton Deal.

The 2<sup>nd</sup> loss Hilton mezz loan attached at an LTV of 68% and detached at 73% and was sold at a 475 basis point spread and the 3<sup>rd</sup> loss mezz loan attached at 66% and detached at 68% and has been circled at 425 basis point spread. In comparing the Extended Stay Hotel deal to the Hilton deal, Maura noted that the Extended Stay Hotel loans tend to trade at higher spreads than Hilton/Sheraton and that they don't particularly like the Extended Stay deal (from a fundamental perspective). As such, they were comfortable with the desk mark on this position (650 basis point spread).

Price Verification Sample  
marks as of 2.12.08

Loan	Current Balance	Duration	Coupon spread	Attached LTV	Detached LTV	Desk Mark	Desk Spread	Risk Notes for Verification
ESH Mezz D [Extended Stay Hotels]	102,780,000	4.0	2.00	64%	69%	84.0	600	ESH trades at wider spreads than Hilton Hilton 3rd loss LTVs 66-68% - circled at 425 Hilton 2nd loss LTVs 68-73% - sold at 475
						83.0	625	
						82.0	650	
						81.0	675	
						90.0	700	
						79.0	725	
						78.0	750	

### Sells and circles

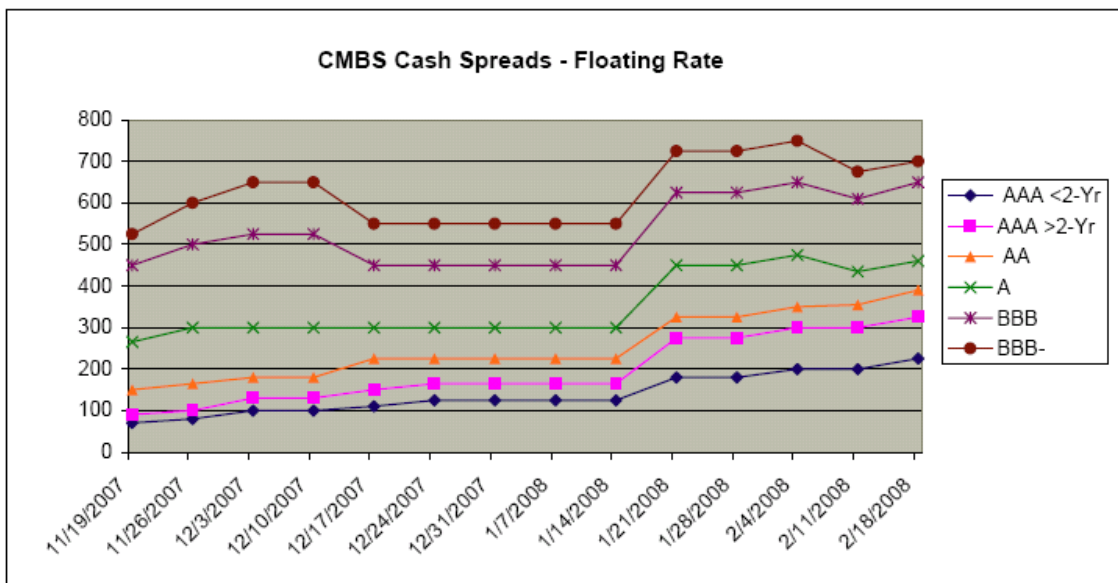
Hilton 3rd loss	69,000,000	4.8	4.25	66%	68%	98.75	425	Circled
Hilton 3rd loss	46,000,000	4.8	4.25	66%	68%	98.75	425	Circled
Hilton 2nd loss	57,500,000	4.5	4.75	68%	73%	100.00	475	Sold
	11,500,000	4.5	4.75	68%	73%	100.00	475	Sold
	23,000,000	4.5	4.75	68%	73%	100.00	475	Sold
	23,000,000	4.5	4.75	68%	73%	100.00	475	Sold
	12,650,000	4.5	4.75	68%	73%	100.00	475	Sold
Hilton 1st loss	299,000,000	4.5	5.25	73%	78%	100.00	525	Sold
Tishman EOP E Mezz	63,475,000	4.0	3.50	64%	68%	95.05	500	Circled

### Price verifying the higher parts of the capital structure

We then asked how they price verify the higher parts of the capital structure of these loans. At the monthly risk meeting in January, Dan Chen stated that they start by looking at the lower rated tranches which they have sold or circled and then adjust the spreads from there as they move up the capital structure for the parts of the loan they have not sold or circled. We asked for more details on the call.

They basically use rating agency feedback along with CMBS cash spreads (for floating rate deals) from AAA down to BBB- tranches. With respect to the Hilton deal (in total), the rating agencies said it would have \$5 billion worth of AAA rated securities and \$3 billion of A-BBB rated securities for the senior mortgages (i.e. excluding the B-note and mezz loan part of the capital structure). Maura will then apply the CMBS floating rate cash spreads from the FAST database (“CMBS Relative Value Matrix”) for the various rating buckets to come up with the prices for those parts of the loan.

We asked what these spreads were based on and they basically said that they had a “lack of transparency” into what was used to construct these curves—“it is a black box” to them. However, in looking at the FAST “CMBS Relative Value Matrix” document that they send us, the floating rate CMBS spreads in the table that Maura used for price verification tied to the spreads on Table 4 within that document which has as its source (Bear Stearns, Markit). In addition, a few pages later in the document are a couple of tables labeled “CMBS Floating Rate Statistics and Pricing Matrix” which has static data on 19 floating rate deals (across a range of issuers including Bear Stearns) that were priced over from 10/2006 through 10/2007. I assume that these are the deals that make up the spreads that are in the table used by risk to price verify the higher rated tranches of the floating rate loans. ***This is an area that should be followed up on- particularly as part of the CMBS price verification exam currently being conducted.***



JTG 2/28/08

## **LEHMAN BROTHERS**

### **FINANCIAL REVIEW – QUARTER ENDED FEBRUARY 28, 2006**

#### **Notes of Meeting of April 11, 2006**

##### **Liquidity and Funding**

- The liquidity pool at the holding company totaled \$16.8 billion at the quarter ended 2/28/06 compared to \$18.3 billion at the year ended 11/30/05. The \$1.5 billion decrease was primarily driven by a decrease in cash capital surplus at the holding company. The “Stockholm Investment”, which amounted to \$1.8 billion at the beginning of the quarter, was liquidated during the quarter and is no longer included in the liquidity pool. The liquidity pool totaling \$16.8 billion at February 28, 2006 was highly liquid, as evidenced by \$7.3 billion in cash and money market funds, and \$7.4 billion in U.S. Treasuries and G7 Government securities.
- Long term debt increased by \$3.8 billion to \$66.1 billion during the quarter ended 2/28/06 as the firm issued \$4.9 billion of long term debt. Strong first quarter earnings and a 500 euro E-CAPS issuance in February also provided additional capital while keeping leverage in check.
- More importantly, the firm had five benchmark long term debt issuances totaling \$5 billion between March 8 and March 29 to meet strong cash capital and balance sheet growth requirements.
- Accelerated growth and strong demand for balance sheet usage and cash capital from the business at the end of the quarter and into March were the headlines. The cash capital requirement increased \$6.5 billion during the quarter, 65% of planned growth for the year, as cash capital usage increased to \$71.4 billion from \$64.9 billion. Strong business demand for increased balance sheet and cash capital requirements accelerated at the end of the quarter and during March causing the firm to revise its plan upward and go into the market and issue an additional \$5 billion of debt, exceeding the planned long term debt issuance for the year within the first four months.
- Cash capital usage for illiquid assets during the quarter increased \$5.1 billion to \$32.2 billion, of which \$20.1 billion was for commercial whole loans. Of the \$5.1 billion increase in cash capital requirement related to illiquid assets, \$3.6 billion was for commercial whole loans as Lehman was building the warehousing pipeline for securitization in the U.S. and Europe. The firm became much more focused on large securitizable assets, particularly commercial real estate lending in the U.S. and Europe. In the U.S., condo conversion deals are a new type of securitizable asset where the firm is lending against condo conversion construction. Lehman did a \$1.2 billion securitization in the quarter which was

the third such securitization ever done. Credit Suisse had previously done two deals. Lehman had additional inventory of this product of \$4.5 billion at 2/28/06. Overall, commercial whole loan inventories totaled \$18 billion at the end of the quarter, up \$3.8 billion. Growth in these less liquid and riskier asset classes accelerated in March as the firm continues to take on significant additional risk. Commercial whole loans get a 100% cash capital charge.

- Total capital for the firm was \$83.6 billion, up \$4.5 billion from the year end capital of \$79.1 billion. Stockholders' equity increased \$700 million to \$17.5 billion in addition to the \$3.8 billion increase in long term debt noted above. The increase in equity was driven primarily by the \$1.1 billion of net income for the quarter, offset in part by a repurchase of \$500 million in Treasury stock.
- The cash capital surplus was \$5.2 billion at 2/28/06 compared to \$6.9 billion at the year end. The \$1.7 billion decrease was driven by the \$6.5 billion increase in cash capital uses exceeding the \$4.8 billion increase in cash capital sources. The \$5.2 billion surplus is significantly above the firm's targeted surplus of \$2 billion.
- The committed facility of Lehman Brothers Holdings, Inc. was renegotiated ahead of time and upsized to \$2 billion from \$1.5 billion on 2/23/06. The three year facility utilization rate is expected to increase to the 30% - 50% range to better fund temporary increases in funding requirements instead of using long term debt for some of this funding. In an unusual move, the facility was fully drawn at the 2/28/06 quarter end. Usually, Lehman does not carry balances on its committed facilities over the quarter end.
- Investor interest in Lehman debt offerings continues to be very strong. While the Fed has raised short term rates, Lehman's debt spreads have remained stable at tight spreads with considerably less volatility in long term rates during 1Q06 than there was in 4Q05. Spreads are expected to widen slightly going forward.
- Lehman Brothers Commercial Bank activity has increased as it is taking customer deposits. Assets grew to \$3.8 billion as deposits increased \$2 billion for LCB. Lehman is aggressively growing the bank to provide lower cost capital to help support the strong growth mortgage and loan products. Treasury is to provide an update on all of Lehman's banks at the next quarterly meeting.
- There was a hybrid securities ruling by NAIC (the National Association of Insurance Commissioners) in mid-March that shook up the previously growing market for hybrid securities. NAIC concluded that Lehman's \$300 million, E-CAPS/hybrid securities issued in August 2005 had the characteristics of common stock requiring significantly more regulatory capital than debt. This classification as common stock shook up the entire hybrid securities market because it brings a much higher risk weighting and capital charge to insurance companies than had been anticipated. Lehman had hoped the E-CAPS/hybrid securities would be classified similar to trust preferreds as the securities have characteristics of both

debt and equity. The controllers of both Capital Markets and Investment Banking stated that there was a significant effect on issuance and trading of these hybrid products in the markets. Hybrid revenues had been robust this year until this ruling. Customer interest and demand for hybrid products has declined dramatically not only among insurance companies but all customers. All customers were concerned about the negative impact on market liquidity and activity for these hybrid products if insurance companies were not active participants. While the impact on business was negative for the hybrid products causing several bankers and traders to significantly miss 2006 budgeted issuance and trading revenues, the Capital Markets CFO stated that it was not totally negative for the firm as certain customers, particularly hedge funds, focused their interest on other high yield products. The firm responded to the changed customer interest, and some increased trading revenues for high yield products have been the result. There was no significant effect on Lehman Treasury because the \$300 million offering of hybrid securities has been sold and Treasury did not plan to issue additional hybrids this year. While Lehman cannot appeal the NAIC ruling directly since they are not a NAIC member, they are supporting insurance clients who are appealing the ruling. The outcome of the appeal should be known by the next quarterly meeting. The staff will follow up.

- The Finance Committee structure and governance process was changed significantly. In addition to the Finance Committee weekly meetings, a Finance Executive Committee has been created that will meet weekly the day after the Finance Committee meeting. The Finance Executive Committee will focus on (1) cash capital sources and uses, (2) MCO – weekly changes in cash positions and one year forward liquidity projection, and (3) the balance sheet. Lehman believes that this will improve efficiency and the decision making process. This is a very positive change in my opinion because it involves senior financial management in the process in a more formal manner and addresses a concern that I expressed in the CSE review. That concern was that members of the firm’s senior financial management rarely attend finance committee meetings and yet approve or make all significant final decisions relating to liquidity, funding, and financial decision making. Treasury indicated that one of the primary drivers of the action was that management shared the concerns described above that I had previously expressed in the CSE review. Lehman has always represented that senior financial management was heavily involved in liquidity, funding and financial analysis and decision making, but it generally was an informal instead of more formal process. While the CFO, CAO, and controllers were members of the Finance Committee, they rarely attended the weekly meetings. With the new Finance Executive Committee structure, they are to attend meetings and be involved in the committee’s actions. The SEC staff is to get minutes of the Finance Executive Committee meetings as well as the current Finance Committee meetings.
- A 2 for 1 stock split for Lehman Brothers Holdings, Inc. was approved by the Board of Directors at the annual shareholders meeting for stockholders of record as of April 18.



- Regarding the Stock Repurchase Program, for 2006 the Board of Directors authorized the repurchase of up to 40 million shares of Holdings common stock for management of the firm's equity capital. Additionally, the Board authorized the repurchase in 2006 of up to an additional 15 million shares for possible acceleration of repurchases to offset a portion of 2007 dilution due to equity-based award plans. During 2005, the firm repurchased approximately 30 million shares at an aggregate cost of \$3 billion.

## **Balance Sheet**

- Balance sheet limits and targets have been revised upward in response to the strong growth in demand for balance sheet usage by the business units. In March 2006, the balance sheet and inventory positions continued to grow as result of strong product demand from the businesses for increased balance sheet. Management responded by increasing limits and raising capital, primarily long term debt, to fund the balance sheet increases.
- Total assets were \$440 billion at 2/28/06, up \$30 billion from \$410 billion at the year end.
- Securities and other inventory positions showed the largest increase, up \$14 billion to \$192 billion from \$177 billion at the year end.
- The largest increase inventory positions was an \$11.1 billion increase in highly liquid government securities, led by a \$5.1 billion increase in U.S. Treasuries. U.S. Agencies increased \$4.2 billion while non-U.S. governments increased \$2.3 billion.
- The commercial whole loan portfolio increased \$3.8 billion as described above plus corporate debt increased \$1.9 billion led by a \$1.4 billion increase in corporate loans in the U.S as less liquid assets increased. The increases along with the additional increases securities inventories that occurred in March raised the inventories of commercial whole loans, real estate related asset backed securities, and corporate loan products to the highest levels ever for the firm. The staff will continue to monitor the strong growth in some of these riskier, less liquid products.
- U.S. equities positions increased \$2.1 billion while a \$1.2 decrease in foreign equities positions occurred.
- Securities borrowed collateralized agreements (stock borrowed) balances contributed \$10.4 billion to the increase in total assets at 2/28/06, as cash equities increased \$2.4 billion, yield enhancement shorts increased \$2.8 billion and prime broker increased \$1.7 billion.
- The increase in the securities borrowed assets were financed in by a \$17.4 billion increase in repos as the change was closely correlated to the change in Government and Agencies inventory.
- Short inventory positions increased \$4.6 billion to \$115.2 billion.
- Other short term borrowing also increased as the increases in asset levels on the balance sheet temporarily got ahead of capital raised to support the growth. That

was corrected in late March as the issuance of long term debt was accelerated. Commercial paper increased \$1.9 billion to \$4.8 billion at 2/28/06.

- Deposits increased a total of \$3.6 billion. In addition to the \$2 billion increase at LBCB, deposits at Bankhaus increased \$600 million and those at LB Bank increased \$900 million.
- During the quarter ended 2/28/06, long term debt increased by \$3.8 billion to \$66.1 billion as the firm issued \$4.9 billion of long term debt in the quarter.
- Stockholders' equity increased \$699 million during the quarter to \$17.5 billion at 2/28/06.

## **Operating Performance Review**

### **Total Firm**

Lehman Brothers Holdings, Inc. again reported record net revenues, net income and earnings per share for the quarter ended February 28, 2006. The firm achieved record net revenues in every business segment and in every geographical region. Net income for the quarter was \$1.1 billion; Lehman's first quarter with net income in excess of \$1 billion. That was up \$262 million or 32% over the fourth quarter of 2005. Net revenues were \$4.5 billion for the first quarter, up \$771 million or 21% over the prior quarter. Return on equity was 26.7%. The strong operating performance continues into the second quarter as March revenues, led by M&A, are running significantly ahead of budget.

<u>Financial Information</u>	<u>1Q06</u>	<u>4Q05</u>	<u>2006</u>	<u>2005</u>
Total Net Revenues (\$ in mil)	4,461	3,690	4,461	11,576
Net Income (\$ in mil)	1,085	823	1,085	2,369
ROE (%)	26.7	20.9	26.7	17.9
Comp Ratio (%)	49.3	48.7	49.3	49.5
Total Assets (\$ in mil)	439,796	410,063		
Long-term debt	65,952	62,309		
Total Stockholders' Equity	17,495	16,794		
Total Capital	83,447	79,103		
Gross Leverage Ratio	25.1x	24.4x		
Net Leverage Ratio	13.5x	13.6x		

### **Business Overview**

Lehman Brothers reports operating results in three business segments: (1) Investment Banking, (2) Capital Markets, and (3) Investment Management.

## Investment Banking

Investment banking revenues increased to \$835 million for the first quarter, up 2% over 4Q05. Revenues were driven by record debt origination, solid equity origination and strong M&A revenues.

- Record debt underwriting revenues of \$410 million were up 24% over the prior quarter
- Debt Capital markets revenues were also strong as they were up 65% over the prior quarter to \$273 million. Derivatives activity was very strong as customers continued to seek innovative structures. Lehman was a market leader in the return of the 30-year issuance.
- Leveraged finance revenues continued strong although down 17% from the prior quarter. This was the second highest quarter ever resulting from the execution of large transactions for Hertz, Avago, Capital Automotive REIT, and NRG Energy.
- Equity origination continued strong although down 5% from the prior quarter, as convertibles highlighted revenues with large transactions with Amgen, Teva Pharmaceuticals and Omnicare. Equity derivatives activity was also strong with a number of large transactions completed.
- Regarding M&A, financial sponsor activity continues to be a market driver with multi-billion fund raisings for Blackstone, Carlyle and KKR. Go-private transactions continued to be strong revenue generators for Lehman including Cablevision, The Sports Authority, Serena Software, Capital Automotive REIT, Education Management Corp and CarrAmerica. Lehman continues to be a leader in large, industry transforming M&A transactions, such as AT&T/Bell South. Increased hostile situations are providing opportunities for sales/restructurings. Higher equity valuations and interest rates are producing more interest in stock for stock transactions and less borrowing.

## Capital Markets

Capital markets revenues increased to a record \$3 billion, up 29% from 4Q05 and 13% over 1Q05.

- Fixed income revenues were a record \$2.1 billion driven by strong performance in interest rate products, credit products, and real estate, partially offset by a decline in U.S. residential mortgages trading revenues and weak CDO revenues. Interest rate products revenues were up 104% over 4Q05 as business was very strong internationally, driven primarily by European derivatives (exotics) and Asia as JGBs were very volatile and the market was strong. As mentioned above, the high yield business was very strong, up 129% over 4Q05, led by strong revenues in the Americas and Asia. Distressed trading, syndicates, and Hynix led the way.
- High grade credit revenues were robust, up 174% over 4Q05, led by hybrids (before the NAIC impact in March), syndicates, and flow trading as spreads remained tight.
- The liquid markets prop or rates proprietary desk also had a great quarter as revenues jumped to \$117 million in 1Q06 from \$35 million in 4Q05.

Contains Confidential Business Information – For SEC Use Only

- Mortgage trading partially offset some of the strong gains noted above as revenues were down 37% primarily because of substantially lower revenues, especially in the U.S., as a result of decreased origination volumes and tighter spreads on securitizations.
- The controller stated that it is very clear that the mortgage origination market is driven by the demand in the securitization market.
- CDO revenues, which totaled only \$25 million, also decreased 63% from 4Q05 because of tighter spreads, limited number of new issue cash CDO transactions and low volumes of synthetic CDOs as the synthetic CDO environment doesn't look good as spreads and margins are thin in a very competitive market.
- Energy trading got on the board with \$8 million of revenues.
- Equities had the best quarter ever driven by the volatility business that was particularly strong in Europe and Asia where the markets outperformed the U.S. A rebound in convertibles and favorable secondary trading opportunities also made strong contributions.
- Equities revenues in 1Q06 were \$944 million, up 28% over the prior quarter and 52% over 1Q05. The volatility business was very robust as the revenues were up 300% over the prior quarter and 160% over 1Q05. The record revenues reflected improved performance in all regions because of strong client activity and successful trading strategies.
- Equities execution revenues were down 22% from the prior quarter as some big losses on block trades in the U.S. more than offset strong customer flow trading with the biggest loss coming from Pioneer Drilling.
- As mentioned above, convertibles also had a very quarter.
- Prop trading had a particularly good quarter with about \$60 million in revenues with the best performance coming in the health care, technology and small cap sectors.

### Investment Management

- Investment management continued its steady growth as revenues were \$580 million, up 14% over the prior quarter.
- Assets under management was a record \$188 billion, up 7%.
- Significant investment is being made in Europe as Lehman is expanding the business outside of the U.S.

### Matters to be followed-up

- Treasury is to provide an update on all of Lehman's banks at the next quarterly meeting.
- Regarding the NAIC ruling relating to Lehman E-CAPS/hybrid securities, the outcome of the appeal of the ruling should be known by the next quarterly meeting and the staff will follow up.
- The SEC staff is to get minutes of the Finance Executive Committee meetings as well as the current Finance Committee meetings.

## LEHMAN BROTHERS

### FINANCIAL REVIEW – YEAR ENDED February 28, 2007

#### NOTES OF THE MEETING OF MARCH 27, 2007

##### Liquidity and Funding

The liquidity pool at the holding company totaled \$27.4 billion at the quarter ended 3/31/07 compared to \$29.1 billion at the year ended 11/30/06. Note that the \$2.3 billion of Aegis investments that was originally included in the Liquidity Pool at 11/30/06 is now excluded after the SEC questioned the appropriateness of including these in the Liquidity Pool. After discussions with the Co-Treasurer, Lehman concluded that the Aegis Investments should not be included in Liquidity Pool assets.

The \$1.7 billion decrease in the Liquidity Pool at 3/31/07 was primarily due to an increase in cash capital requirements for loan funding.

Boxed inventory amounted to \$26.8 billion of the \$27.4 billion Liquidity Pool amount. The largest positions included were \$7.8 billion of Agency MBS, \$5.9 billion of CMOs, and \$4.0 billion of Treasuries and Governments. All liquidity pool holdings are tri-party eligible.

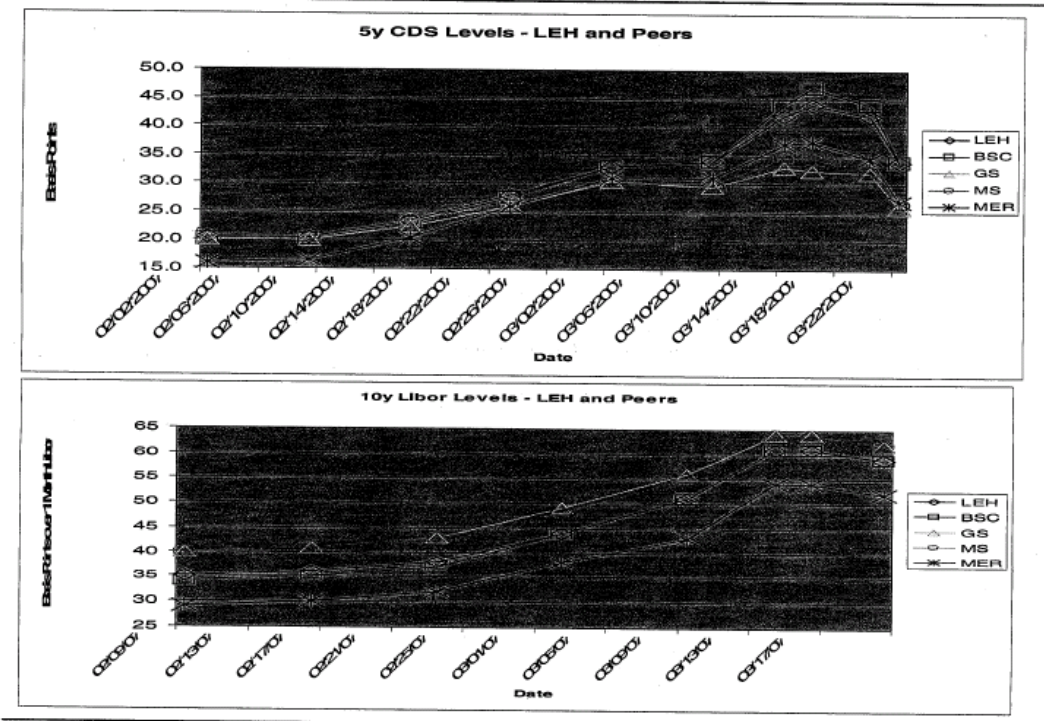
The inclusion of \$2.1 billion in the Holding Company liquidity pool that is described in the presentation as residential mortgages in Lehman Brothers Bank is of concern. In subsequent discussions, the Treasurer and others in Treasury have advised that this \$2.1 billion is an overnight unsecured deposit in the bank by the holding company. It is questionable as to whether bank regulators will allow the cash to be withdrawn from the bank and moved to the holding company in a firm specific stress event. Lehman has been asked to clarify the reasons for inclusion of this amount in the holding company liquidity pool.

The trends in debt spreads, the effects on Lehman's ability to access debt markets, and the overall firm liquidity were discussed at the request of the SEC. While short term rates were stable, long term rates for Lehman, as well as the other CSE firms, were volatile with significant widening in credit spreads beginning in late February due primarily to negative news in the sub-prime mortgage sector. CDS spreads for Lehman and Bear widened a bit more than those of the other three firms, although the Lehman stated that the movement in CDS spreads was an exaggeration of the movement in debt credit spreads and their cost to access the markets. They also stated that the CDS spreads are a guide to where the market is. Lehman and Bear did suffer the most spread widening because those two firms are most closely correlated to the mortgage securitization market. In general, the spike in credit spreads was not unexpected after a prolonged period of credit spread stability in the range of all time tight levels in the brokerage sector. The spread widening **DID NOT** significantly impact Lehman's liquidity. The

firm has strong liquidity primarily because of a very aggressive debt issuance program that has taken advantage of the tight spreads during the past six months, including the first quarter, and the flexibility to use other funding sources and markets geographically outside of the U.S.

Credit spreads widened as much as 20-25 bps in the four weeks since late February and appear to have hit their widest levels on March 16. Since that time the spreads have tightened 5-10 bps but still remain volatile with no clear trend to date. See the attached page of "Spread Graphs" provided by Lehman at the meeting.

## Spread Graphs



LEHMAN BROTHERS

2

The credit spreads of the securities firms widened much more than bank spreads and the spreads in the broader market as the market focused on the persistent negative news relating to the sub-prime mortgage sector. Lehman has not been issuing long term debt during this period with 5 year and 10 year spreads significantly wider. Spreads on 10 year debt widened from LIBOR plus 35 bp in early February to a peak of LIBOR plus 60 bp before tightening slightly since then. Lehman had a \$2.5 billion 2 year issuance at LIBOR plus 7 bp on March 20<sup>th</sup> as the CSE firms have shifted their issuances to the shorter end of the curve where funding costs are lower. Finance companies, such as Countrywide and CIT, suffered the most as their spreads really widened out. During this period CDS spreads have been more volatile than cash spreads, which was attributed to the increased amount of liquidity in CDS relative to cash. Lehman stated that CDS seems to be the focus of speculators and investors.

Sub debt spreads have fared worse than the senior debt spreads during this period. This is likely because of the unusually tight spreads between the two during 2006 and early 2007. Spreads on sub debt issues last fall were 6–7bp wider than those of senior debt. Currently sub debt spreads are 10-12 bp wider than senior debt spreads.

Lehman aggressively issued \$15.8 billion of long term debt during the first quarter of 2007 before the negative sub-prime news to take advantage of the tight brokerage spreads and in anticipation of strong demand for balance sheet usage from the businesses. Lehman has already issued more than half of budgeted long term debt issuance for all of 2007 as balance sheet growth and cash capital requirements exceeded the budget. Based on available information, it appears that Lehman issued more debt than Goldman in the first quarter although about \$10 billion less than Merrill. This aggressive pace of debt issuance also occurred last year as Lehman budgets debt issuance rather conservatively requiring compliance with certain debt and leverage ratios and demanding strong profitability justification from the businesses to grow their balance sheet usage. In the first quarter of 2007, demand for balance sheet growth from the businesses was very strong as reflected in the record revenues and net income reported. Total assets increased 12% during this first quarter. Balance sheet growth at Lehman has been greatest during the first several months of the calendar year during the past few years. This growth is primarily funded by long term debt issuance.

Lehman has liquidity and funding flexibility. The firm has moved to the short end of the curve for lower cost funding in this steep credit curve environment. As mentioned above, the firm had a \$2.5 billion 2 year note offering on 3/20/07. They have drawn and repaid \$2 billion on their committed facility which is commonly done in the normal course of business to prevent signaling. There was an explosion of structured note issuance during the quarter as the firm issued a record \$5 billion of structured notes at favorable rates where the investor's motivation for entering into the structured is not the interest rate. Lehman also has geographical flexibility for debt issuance for the significant spread widening has been a U.S. only event. Lehman has the flexibility to issue in Europe, Japan and Australia although the amounts may be smaller.

Lehman's outlook for the rest of 2007 is that they believe that spreads hit their wide levels on March 16 and that the sub-prime mortgage fall out will not be as bad as the market seems to have expected. The firm has significant funding flexibility which allows it to bid its time until spreads normalize at which point they can move ahead with the rest of their issuance plan for 2007. The expectation is for the curve to be more normalized and for spreads to be tighter the second half of the year.

The net leverage of 15.4x continued to increase even more than previously indicated by management. The budget for 2007 was for leverage to increase to 14.5x from the 13.5x in 2006. The net balance sheet grew by 12% with capital markets prime services accounting for the largest part of that growth. Treasury maintained that the firm was not overly concerned about the increase in leverage and that it had been explained to the credit rating agencies that the largest part of the growth was in liquid assets related to the hedge fund business.

## **Cash Capital**

Cash capital requirements grew faster than budgeted in the first quarter. The cash capital surplus was \$5.3 billion at 2/28/07 vs. \$6.0 billion at 11/30/06, down \$700 million. This was well above Lehman's cash capital surplus target.

Cash capital usage increased to \$110.2 billion at 2/28/07 vs. \$94.7 billion at 11/30/06, up \$12.8 billion. The increase in cash capital usage was driven mainly by a large \$11.5 billion increase in requirements for less liquid assets to \$59.5 billion from \$48.0 billion at the year end 11/30/06. Cash capital requirements for commercial whole loans and corporate loans were up \$9 billion this quarter to \$42.7 billion after being up \$9.4 billion last quarter. In two quarters, commercial whole loans and corporate loans have increased over \$18 billion to \$42.7 billion from \$24.5 billion at 8/31/06.

Non trading asset cash capital requirements increased \$1.2 billion this quarter driven entirely by illiquid equity and investment management division investments. Non trading assets totaled \$16 billion at 2/28/07 including equity investments, goodwill, fixed assets, operation cash in banks, deferred tax assets, etc which get 100% cash capital.

## **Long Term Debt**

After issuing \$15.8 billion of long term debt in the quarter, Lehman had \$87.8 billion outstanding at 2/28/07 vs. \$78.5 billion of long term debt outstanding at 11/30/06. The growth in long term debt matched the growth in the balance sheet and in equity. The ratio of long term debt to the net balance sheet was 29% both at 2/28/07 and at 11/30/06.

The holding company had a \$1.3 billion UK sub debt issuance during the quarter.

Net leverage was 15.4x at 2/28/07, above the targeted at 14.5x and up from the 13.5x level of prior years. The firm is having difficulty keeping the leverage down to the desired level. Treasury has been discussing the issue with the rating agencies as well as the regulators.

## **Balance Sheet**

Total assets were \$562 billion at 2/28/07 compared to \$504 billion at 11/30/06, up \$58 billion or 12%.

Long securities inventory positions were up \$30 billion accounting for the largest part of the increase. Residential mortgage positions increased \$10 billion, commercial mortgages were up \$6.5 billion, corporate debt was up \$5 billion and long equities were up \$9.4 billion as first quarter activity picked up substantially.

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Combined reverse repos and securities borrowed were up \$25.8 billion. Reverse repos were up \$14.4 billion and securities borrowed increased \$11.4 billion.

Customer receivables were up \$3 billion primarily because of a \$2.4 billion increase in prime broker margin debits.

On the liabilities side, short inventory positions were up \$14.9 billion led by a \$6.4 billion increase in equities, a \$5 billion increase in Governments and a \$3.7 billion increases in corporate debt.

Combined repos and securities loaned increased \$17.8 billion with repos up \$19.8 billion and securities loaned down \$2 billion.

Payables to brokers, dealers and clearing organizations jumped to \$10 billion at 2/28/07 from \$2.2 billion at 11/30/06. A \$7.7 billion trade date accrual in Treasuries related to volatility around month end accounted for the biggest part of the increase. There was significant market volatility the last few days of the February. This was primarily from Global Rates and Securitized Products activity.

Stockholders' equity increased \$800 million during the quarter to \$20 billion at 2/28/07.

### **Acquisition of D.E. Shaw Interest**

On March 13, 2007, Lehman announced that it had entered into an agreement to acquire a 20% interest in D.E. Shaw. Lehman stated that the plan is not to acquire all of D.E. Shaw but to own a minority interest. This is part of Lehman's private equity, strategy and adds D.E. Shaw to the list of investment firms in which Lehman owns an interest including GLG Partners, Marble Bar Asset Management, Ospraie Management and Spinnaker Capital.

### **Operating Performance Review**

Lehman reported record revenues of \$5 billion for the first quarter, up 11% over the prior quarter and 13% over the first quarter of 2006.

Net earnings were a record \$1.1 billion for the quarter, up 14% over the prior quarter and 6% over the first quarter of the prior year.

Record revenues were also reported for both the Capital Markets and Investment Management segments. Europe and Asia also reported record revenues.

The capital markets revenues of \$2.2 billion were led by equities where revenues of \$1.3 billion were up 42% over the prior year and 49% over the prior quarter driven by strong client activity and principal trading gains particularly in Europe. Revenues for the volatility business were \$270 million, up 130% over the prior quarter.

Fixed income revenues were up slightly to \$2.2 billion as the credit products, global rates

and FX businesses performed well while securitized products origination and trading businesses were off substantially as might be expected.

### **Organization Changes**

Ed announced a number of changes in his organizational responsibilities. Kristine Smith is moving from Financial Reporting to be the Global Treasury Controller. She will be responsible for reporting, hedging and FX among other responsibilities. Steve Rossi, an assistant controller, will take over Kristine's CSE reporting responsibilities as well as responsibility for all reporting functions, all acquisitions staff, and regulatory reporting. Tony will now report directly to Steve instead of reporting to Ed. Ryan, who was recently hired from Price Waterhouse, was introduced as the person who will provide the balance sheet analysis in future quarterly financial review meetings as Kristine moves to Treasury.

## **LEHMAN BROTHERS**

### **FINANCIAL REVIEW – QUARTER ENDED MAY 31, 2006**

#### **Notes of Meeting of JULY 19, 2006**

##### **Liquidity and Funding**

- The liquidity pool at the holding company totaled \$22.2 billion at the quarter ended 5/31/06 compared to \$16.8 billion at the quarter ended 2/28/06. The \$5.5 billion increase was primarily driven by a \$12.4 billion increase in liquid boxed inventory that was funded by a very strong quarter of long term debt issuance. The cash position in the liquidity pool decreased by \$6.9 billion partially offsetting the increase in liquid assets in the box. An increase of \$8.6 billion of Agencies was the largest contributor to the \$12.4 billion increase in inventory in the box. While all assets in the liquidity pool are viewed by Treasury as highly liquid, the staff did discuss the liquidity of \$2 billion of equities. The Treasurer noted that these are highly liquid major index stocks that are actively traded. He further stated that these are easy to hypothecate and fund because there are so many people currently shorting these stocks. There was also a brief discussion of the \$1.6 billion of investment grade private COM's which the firm asserted were very liquid.
- Lehman's issuance of long term debt was the highest ever during the quarter with \$19.4 billion issued during the quarter. This compares to \$22.6 billion issued during the whole year in 2005. Growth in the long term debt has matched growth in the balance sheet and equity as Lehman has kept its leverage in line with targets. Long term debt was \$81,379 at 5/31/06 compared to \$65,952 at 2/28/06.
- The Treasurer stated that Lehman was aggressive in issuing long term debt for a number of reasons. Market conditions changed becoming more challenging. At times during the second quarter, it appeared that the very favorable issuance conditions might be coming to an end. There were times when it was difficult to issue debt at attractive rates as spreads widened. Those financial institutions that issued debt in the face of widening spreads moved the market because as they issued at wider spreads. Investors were unwilling to go back to tighter spreads and the wider spreads were generally sustained. There were a few times when there was almost zero investor appetite for new debt, particularly during times of high market volatility like occurred in May. Additionally, there was very strong demand from the businesses for more balance sheet usage and funding that was being approved by senior management. In July, the debt issuance markets were less volatile and still remain positive.
- The changing markets required Lehman to make some changes to plans for issuance for the year. In addition to increased levels of issuance during the

quarter, the firm is looking closer at different markets with more emphasis on Canada, Australia, and Europe and issuing straight paper to retail investors.

- There was no material change in short term debt issuance or in secured funding.

### **Cash Capital**

- The cash capital surplus was \$7.4 billion at 5/31/06, up from \$5.2 billion at the year end. The \$2.2 billion increase was driven by the \$16.9 billion increase in cash capital sources driven primarily by the new issuances of the long term debt which exceeded the cash capital uses of \$14.7 billion. The \$7.4 billion surplus is significantly above the firm's targeted surplus of \$2 billion, partly in anticipation of above normal cash requirements in early June.
- Cash capital usage for less liquid assets during the quarter increased another \$8.1 billion to \$40.3 billion from \$32.2 billion in the second quarter, of which \$25.2 billion was for commercial and residential whole loans, up another \$5.1 billion in the second quarter and a total increase of \$8.7 billion for the first six months of the fiscal year as Lehman has been building the warehousing pipeline for securitization in the U.S. and Europe. The growth is primarily related to small to medium sized transactions.
- Cash capital requirements for margin and OTC requirements increased by \$4.1 billion to \$9.9 billion driven primarily by an increase of \$3 billion in cash capital requirements required to fund uncollateralized receivables for OTC Derivatives.
- Total capital for the firm at 5/31/06 was \$90.5 billion, up \$14.3 billion from \$76.2 billion at the end of the prior quarter. The increase was driven by the long term debt issuances.

### **Balance Sheet**

- For 2006, the firm currently expects the balance sheet to grow by 15% with the growth coming primarily in the Fixed Income Division and Capital Markets Prime Services. Most of the growth is expected to be in the net balance sheet. Net balance sheet leverage as calculated by Lehman will continue to be targeted at a level below 14.0x. During the first half of the year, gross balance sheet growth has been 11%. Leverage is in line with the target.
- Balance sheet limits and targets have been revised upward in response to the strong growth in demand for balance sheet usage by the business units.
- Total assets were \$456 billion at 5/31/06, up \$16 billion from \$440 billion at 2/28/06
- The largest increase in the balance sheet was in customer receivables which were

up \$8 billion to \$22 billion from \$14 billion at the end of the first quarter. Of the \$8 billion increase, \$5.8 billion came from the Prime Broker business primarily in the U.K. An additional \$2.6 billion increase related to fails to deliver of which the largest was a \$1.1 billion LBIE third party customer fails to deliver primarily in Fixed Income.

- Securities and other inventory positions increased \$6 billion at 5/31/06 to \$197 billion. Contributing to the increase were increases of \$6.8 billion in mortgages, \$3.6 billion in derivatives, \$2.3 billion in corporate debt, and \$1.5 billion in equities. These increases were partially offset by decreases of \$4.9 billion in government securities and \$3.5 billion in money markets.
- Short inventory positions increased \$7 billion driven mainly by increases in structured volatility and derivatives positions.
- Stockholders' equity increased \$489 million during the quarter to \$18.0 billion at 5/31/06. The increase from the \$1 billion net income for the quarter and additional stock issued was partially offset by the purchase of treasury stock in the amount of \$1.6 billion.
- A NAIC update on Lehman's ECAPS/Hybrid capital \$300 million issuance in August 2005 was given. The NAIC Securities Valuation Office classified the Lehman issue as equity instead of debt or preferred stock requiring insurance companies who would invest in the Lehman securities to hold significantly more capital than is the securities were classified as debt or preferred stock. NAIC has not changed its position but has agreed to review the matter as other issuers have also complained to NAIC.

## **Operating Performance Review**

### **Total Firm**

Lehman Brothers Holdings, Inc. again had a strong quarter as the firm reported their second highest quarterly revenues, net income and EPS ever in the quarter ended May 31, 2006 driven by record results in Capital Markets and Investment Management. Investment Banking revenues in the second quarter were down 11% from the first quarter of 2006. Net income for the quarter was \$1.0 billion, down slightly from the record \$1.1 billion of net income in the first quarter of 2006. Net revenues were \$4.4 billion for the quarter, again down slightly from the \$4.5 billion for the first quarter of 2006. These operating results were up substantially over those of the prior year. Return on equity was 23.7% versus 26.7% for the first quarter of 2006. Operating performance has been a bit soft according to the firm in the early part of the third quarter.

<u>Financial Information</u>	<u>2Q06</u>	<u>1Q06</u>	<u>YTD2006</u>	<u>2005</u>
Total Net Revenues (\$ in mil)	4,411	4,461	8,872	11,576
Net Income (\$ in mil)	1,002	1,085	2,087	2,369

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ROE (%)	23.7	26.7		17.9
Comp Ratio (%)	49.3	49.3	49.3	49.5
Total Assets (\$ in mil)	456,202	439,796		
Long-term debt	81,379	66,096		
Total Stockholders' Equity	17,982	17,495		
Total Capital	99,361	83,589		
Gross Leverage Ratio	25.1x	24.4x		
Net Leverage Ratio	13.5x	13.6x		

## **Business Overview**

Lehman Brothers reports operating results in three business segments: (1) Investment Banking, (2) Capital Markets, and (3) Investment Management.

### **Investment Banking**

Investment banking revenues decreased to \$741 million in the second quarter, down 11% from \$835 million for the first quarter. M&A and equity revenues exceeded the prior quarter by 8% and 4% respectively. Advisory revenues were the second highest ever. Debt origination revenue for the second quarter decreased by 30% versus the first quarter of 2006.

- Financial sponsor transactions continue to be a market driver
- The Consumer/retail sector business had a record quarter. Communications and Natural Resources also had strong quarters.
- The Global Pipeline volume and fees remain strong with M&A, Equity, and Investment Grade volumes currently at record levels for the firm. However, there are more uncertainties in the market resulting in pulled IPOs and raising questions as to how much of the strong pipeline volume and revenues will actually be realized. Sponsors are using the equity markets less as they see equal value in M&A transactions. Equity secondary market deterioration could have a negative impact on the new issue flow as IPOs and secondary offerings have been pulled because market pricing is not high enough.
- Equity origination revenues were up 5% during the second quarter over the first quarter of 2006. IPO activity was strong as IPO volume was up 94%, significantly outpacing the market volume increase of 56%. Secondary and convertible issuance and volume declined from robust first quarter levels.
- Leveraged finance revenues were down 24% in the second quarter from the first quarter of 2006, but were up 60% over the second quarter of 2005. The second quarter 2006 revenues were driven by the execution of large transactions in Dunkin' Brands, Reynolds American, MEG Energy and Arlight Capital. The leveraged Finance market was driven by increased M&A activity and leveraged buyouts which should continue throughout 2006.
- Investment banking revenues related to Debt Capital markets origination declined

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32% to \$185 million from the prior quarter level of \$273 million reflecting the weakness in the credit markets. The decline in credit market activity was partially offset by an increase in non-financial jumbo issuances with several large issuances in the telecom sector.

- Financial advisory revenues were up 8% to \$244 million from \$226 million for the first quarter of 2006. This was the second highest financial advisory revenue quarter ever driven by the completion of more medium sized transactions.
- Geographically, investment banking in the Americas was off 3% to \$563 million from the \$582 million of revenues in the first quarter of 2006. Revenues in Europe fell 40% to \$236 million from \$142 million in the record first quarter of 2006. Debt capital markets accounted for most of the decrease as derivatives solutions revenues fell significantly. Asia revenues were up 112% but were very small as they were \$36 million in the second quarter compared to \$17 million in the first quarter of 2006.

### Capital Markets

Capital markets revenues increased to a record \$3.1 billion for the second quarter, slightly higher than the \$3.0 billion of revenues for the first quarter of 2006.

International business continued strong in the second quarter representing 34% of FID revenues and 69% of Equities revenues. That compares to 39% of FID revenues and 61% of Equities revenues in the first quarter of 2006.

- Fixed income revenues were a record, up 5% to \$2.2 billion for the second quarter, driven by strong performance in both commercial and residential real estate revenues. The CMBS business has been strong all year long for Lehman with revenues in Europe picking up in the second quarter. Structured finance and mortgages revenues were also strong.
- Equities revenues were \$878 million, down 7% from the record \$944 million in the first quarter of 2006. The global equity markets experienced significant volatility during May, fueled by concerns over inflation, rising interest rates, and higher oil prices. The results were driven by significant improvement in the Cash business across all regions and continued strong performance in the Volatility business. Cash equities for the Americas reported record revenues on strong customer flow and an investment gain of \$71 million on the sale of the firm's NYSE interest. The large block trade losses that occurred in the first quarter did not occur in the second quarter of 2006. The European cash business also had a strong quarter driven by customer flow. The volatility business reported good revenues of \$255 million for the second quarter. While these revenues were up 52% over the prior year second quarter, they were down 32% from the \$372 million of revenues in the very strong first quarter of 2006. The revenues for the second quarter of 2006 were driven by favorable and volatile market conditions and profitable trading strategies across sectors and markets. Equities GCS revenues were \$194 million for the second quarter, up 48% over the first quarter of 2006, driven by strong Prime Brokerage business and seasonality in yield enhancement primarily in Europe. Equity strategies, which is all proprietary, revenues declined to \$39 million in the second quarter, down from \$60 million in

the first quarter of 2006 as a result of losses recorded from unfavorable risk taking in May after solid performances in March and April.

### Investment Management

- Investment management continued its steady growth as revenues were \$592 million in the second quarter of 2006, up from \$580 million the prior quarter.
- Assets under management again was a record \$198 billion, up from \$188 billion in the prior quarter.
- Significant investments continue to be made in Europe as Lehman is expanding the business outside of the U.S.



## **LEHMAN BROTHERS**

### **FINANCIAL REVIEW – QUARTER ENDED May 31, 2007**

#### **NOTES OF THE MEETING OF JUNE 28, 2007**

#### **Liquidity and Funding**

##### **Liquidity Pool**

The liquidity pool at the holding company totaled \$23.4 billion at the quarter ended 5/31/07 compared to \$27.4 billion at the quarter ended 2/28/07.

The \$4 billion decrease in the Liquidity Pool at 5/31/07 was primarily due to increased cash capital requirements for loan funding. Funds in the amount of \$4.5 billion were used to pay down two drawn committed facilities to zero at the quarter end. Generally the committed facilities are not drawn at the end of the quarter and year. That repayment and low liquidity pool balance caused a MCO shortfall of \$1.5 billion, a shortfall in the model for the liquidity position one year forward. This is a breach of policy. Treasury immediately re-drew the facilities after the quarter end bringing them back into compliance.

The \$23.4 billion Liquidity Pool was comprised primarily of \$12.9 billion of Agency MBS, \$3.8 billion of CMOs, \$2.6 billion of equities, \$2.4 billion of Treasuries/Governments, and \$920 million of cash. All liquidity pool holdings are tri-party eligible. Lehman again confirmed that none of the liquidity pool has been invested in CDOs.

##### **Funding and Long Term Debt Issuance**

Funding requirements were up substantially during the second quarter as the cash capital requirements of \$16.7 billion grew faster than originally budgeted. Treasury funded the growth by issuing \$17.8 billion of long term debt bringing the total debt issuance for the first half of 2007 to \$33.3 billion, compared to \$39.3 billion for the full year of 2006.

Lehman debt spreads widened out significantly, along with other CSE firms, in the second quarter following the sub-prime turmoil. They reached their widest levels in mid-March. From that point on through the end of the quarter and into the first part of June, spreads went on a slow, steady grind tighter ending the period, 5/31/07, very close to where they began the quarter. While the sub-prime mortgage fears were the primary reason for the wider spreads, the firm stated that it seems that the market is demanding a premium for brokerage debt until those fears are resolved.

Subsequently during the second half of June, spreads again widened considerably

and the credit curve steepened reflecting the effects of the BSAM events on Lehman and other securities firms. Lehman expects the spreads to again slowly become tighter, although there is more and more concern that the very favorable investor interest in the securities firms and low rates are closer to ending.

May was the biggest debt issuance month ever for Lehman. The firm's debt issuances during the quarter included a number that were notable including a \$2.5 billion 2 year and a \$2.8 billion 3 year floating rate note issuances. A large \$1.05 billion Samurai issuance was three times the size of Lehman's largest previous issuance in Japan. The firm also issued \$1.5 billion of subordinated debt, the hybrid issuance of MCAPs at the end of May with very tight spreads.

Total assets increased \$42.1 billion to \$604 billion at 5/31/07 compared to \$562 billion at 2/28/07.

Net leverage was flat at 15.4x for both 5/31/07 and 2/28/07, above the target at 14.5x and up from the 13.5x level of prior years. The firm is willing to allow the leverage to increase in 2007. Treasury has asserted that most the assets financed by the additional debt are liquid assets, including broker margin loans and inventory positions. Treasury has been discussing the increased leverage with the rating agencies as well as the regulators.

#### Large Cash Requirements and Liquidity Fluctuations

Despite participating in numerous sizable transactions and many of the largest transactions in 2007, Lehman apparently has not been experiencing the very large deal specific cash requirements and holding company liquidity fluctuations like some of the other CSE firms. The Treasurer explained the primary reason for this is the Lehman culture and governance policies limiting the required funding for deals to \$1 billion. Any funding requirements in excess of the \$1 billion must go to the Executive Committee for approval and there are very few of those. Some large transactions at other firms have had cash requirements in the \$3 billion to \$6 billion range. However, the Treasurer's explanation was not entirely consistent with the data, which shows commercial whole loans balances up 48% for the first six months of this year and several loans funded this quarter in excess of \$1 billion. See less liquid assets below for more information. While the number of very large individual deal cash requirements has been limited, the numerous deals being done, primarily relating to leveraged lending and real estate projects financing, have nonetheless required substantial increases in total funding requirements for the firm. There has also been some increase in cash requirements related to dividend reinvestment trades, concentrated in Europe, but those requirements will go away soon as the dividend season activity concludes.

#### Cash Capital

Cash capital requirements continued to grow significantly during the quarter as the requirements increased \$17.5 billion to \$144.3 billion following an increase in cash

capital requirements of \$16.5 billion in the first quarter of 2007.

The cash capital surplus was \$2.5 billion at 5/31/07, down from \$5.3 billion at 2/28/07 as the continuing strong demands for cash capital eat into the surplus.

#### Less Liquid Assets

The large increases in cash capital requirements are being driven by less liquid assets, which are up 48% in the first six months of this year.

Less liquid assets amount to \$71.2 billion at 5/31/07 compared to \$48.0 billion at 11/30/06.

Commercial whole loans are the biggest driver having increased to \$36.8 billion at 5/31/07 from \$24.1 billion at the year ended 11/30/06, including a \$7.1 billion increase in this quarter. Commercial whole loans on Lehman's balance sheet are commercial loans that are documented as loans essentially.

Real estate held for sale includes funding that is provided to fund projects that are not documented as loans, primarily real estate projects, and includes mezzanine financing, bridge equity, equity interests and other transactions where the firm has provided funding and retains part of the risk with the accounting rules requiring inclusion of the financing as a part of Lehman's balance sheet. The balance of real estate held for sale jumped to \$16.0 billion at 5/31/07, up \$6.9 billion from the prior quarter.

Net funding for the following projects were the largest loans requiring cash capital: \$2.8 billion for Project Trois which is now called the Beacon III Project, \$1.3 billion for 237 Park Ave, \$600 million for the German Commercial Real Estate Loan Portfolio # 1, \$500 million for Kapiteeli, and \$500 million for Project Pearl.

Non trading asset cash capital requirements increased \$2.2 billion, a substantial jump again this quarter driven entirely by a number of illiquid equity and investment management division investments. Non trading assets totaled \$18 billion at 5/31/07, up from \$16 billion at 2/28/07. The largest individual investment was the \$784 million cash payment for the 20% interest in D. E. Shaw. There are details of more investments under the Acquisitions/Private Equity Investments section below.

#### Balance Sheet

Total assets were \$604 billion at 5/31/07 compared to \$562 billion at 2/28/07, up \$42 billion or 7.7%. Secured or collateralized financing asset and liability balances were up slightly compared to the prior quarter at \$249.1 and \$165.8 respectively. The increase was attributed to equity financing for hedge funds.

The \$28 billion increase in long securities inventory positions was the biggest part of the increase in total assets. Long securities inventory was up \$28 billion to \$284

billion at the end of the second quarter after increasing \$30 billion in the first quarter of 2007. Corporate loans were up \$8.2 billion, corporate debt increased \$6.5 billion, equities were up \$6.1 billion, derivatives increased \$5.7 billion, and residential mortgage balances increased \$3.7 billion compared to the balances at 2/28/07.

The \$6.5 billion increase in corporate debt positions was driven by a \$1.8 billion increase in European volatility derivatives, a \$1.6 billion increase in Non-US corporate loans, and a \$2.9 billion increase in FID inventory trading positions including high yield and high grade. Most of the \$8.2 billion increase in corporate loans is discussed above under less liquid assets.

Customer receivables were up \$5.5 billion to \$27 billion from \$21.5 billion as prime broker margin debits were up again in the amount of \$4.4 billion this quarter. Fails were also up \$1.2 billion reflecting the increased fails in Europe related to the seasonal dividend reinvestment business.

On the liabilities side, short inventory positions jumped \$27 billion or 19% to \$168 billion at 5/31/07 compared to \$141 billion at 2/28/07. The increase was driven by a \$16.1 billion increase in shorts of corporate equities, \$6.2 billion increase for derivatives, and \$3.7 billion for governments & agencies shorts. The \$16.1 billion increase in shorts of corporate equities was driven by a \$11.9 billion increase in foreign equities where the European strength has been in the derivatives volatility business on the short surfaces.

Customer payables were up \$7.2 billion or 18% to \$48 billion reflecting increased customer business driven by a \$6.1 billion in prime broker shorts and a \$1.1 billion in Fails to Receive.

Short term borrowings and current portion of long term debt was up \$3.7 billion or 15% to \$27.7 billion driven primarily by an increase in unsecured bank loans in spite of the \$4.5 billion repayment of the credit facilities before the quarter end. A slight increase in the current portion of long term debt also contributed to the increase.

Stockholders' equity of \$21.1 billion was up \$1.1 billion over the \$20 billion at 2/28/07. Equity was increased by \$1.25 billion of net income and \$300 million of employee restricted stock while decreased by stock repurchases of \$530 million and dividends of \$90 million.

## **Operating Performance Review**

### **Firm Overview**

Lehman reported record revenues of \$5.5 billion for the second quarter, up 9% over the prior quarter and 25% over the second quarter of 2006 as Lehman took advantage of steadily improving market conditions in equities and a continued increase in

M&A and LBO activity. Lehman had significant growth in Investment Banking and Equities Capital Markets this quarter. The firm believes that conditions in the sub-prime business remain challenging, but are reasonably contained. The firm's operating performance in June continues to be strong with revenues for the third quarter currently projected at \$5.4 billion.

Net earnings were a record \$1.3 billion for the second quarter, up 11% over the prior quarter and 27% over the second quarter of the prior year.

ROE was 25.8% for the quarter compared to 24.4% in the first quarter of 2007 and 23.7% in the second quarter of 2006.

Record revenues were reported in all business segments and in the firm's European and Asian regions, including a 55% increase in Investment Banking revenues compared to the second quarter of the prior year and a 35% increase over the first quarter of 2007. Non-U.S. revenues represented 48% of the firm's quarterly revenues for the second quarter of 2007 reflecting the regional diversification as well as product diversification of the firm's business.

Capital Market's record revenues of \$3.6 billion for the quarter were up 3% over revenues of \$3.5 billion in the first quarter of 2007. Equities Capital Markets reported record revenues of \$1.7 billion, up 27% from the first quarter of 2007 and nearly double the \$878 million of the second quarter of 2006. Fixed Income Capital Markets revenues were \$1.9 billion, down 13% from the first quarter of 2007.

### Equity Capital Markets

The strong performance in Equities Capital Markets revenues of \$1.7 billion, nearly double the revenues of the comparable prior year period, was led by record revenues driven by record customer activity and strength in execution services, prime services, equity derivative businesses, and profitable trading strategies. Global equities rallied strongly following the late February selloff. These record results reflect the strong equity market trends and the benefits of Lehman's investments in people and technology, most notably in derivatives and prime brokerage. Revenues in equity derivatives rose substantially driven by higher levels of trading volumes, particularly in Europe and Asia including flow derivatives, corporate derivatives, exotics, and structured note products. This growth is attributed to increased investor appetite to taking market exposure through derivatives, as well as for the utilization of derivatives to hedge existing positions for certain products.

Execution services revenues were \$473 million, up 14% from the prior quarter led by a 36% increase in European revenues driven by increased customer flow as well as robust gains on principal trading.

Volatility revenues were \$435 million, up 61% from the prior quarter with record revenues across every region driven by strong customer activity, profitable trading

strategies and very compelling corporate derivatives revenues.

Equity prime services revenues were \$371 million, up 60% from the prior quarter driven by the continued growth in balances and number of clients as well as stronger performance from the seasonal yield enhancement business, dividend reinvestment business.

The prime broker and financing businesses posted record revenues as well, with results bolstered by seasonally higher European activity. Increased prime broker client balances rose for the eighth quarter in a row and ended the quarter with balances of \$212 billion, up 22% from the prior quarter level. Prime broker continues to grow including increased interest from new hedge funds in Europe and Asia. The non-US component of this business continues to expand and be a significant contributor reflecting Lehman's geographic breadth and increased client capacity.

Lehman also is focusing on the growth in U.S. investor demand for international products.

Private equity gains totaled \$87 million for the quarter, down slightly from \$102 million in the first quarter of 2007.

#### Fixed Income Capital Markets

In Fixed Income Capital Markets, the quarterly revenues of \$1.9 billion reflected continued weakness in the U.S. residential mortgage business and decreased revenues in municipal and interest rate products, which exceeded gains in real estate and credit product revenues. The \$1.9 billion of fixed income revenues were down 14% year over year and 13% from the last quarter.

Results from the credit businesses were down slightly from the record levels the prior quarter due to lower levels of trading. In the securitized products businesses, which include residential mortgages, revenues were down from the prior quarter due to continuing challenges in the subprime sector. Although Lehman believes that the subprime business will continue to face headwinds in the near future, they are seeing some positive signs, such as gradual improvement in the pricing power for lenders and a pickup in secondary market investor activity, including for non-investment grade positions.

In other fixed income businesses, munis were down, commercial real estate continued to be strong and the liquid markets business, which includes interest rate products and foreign exchange, was up as a decline in U.S. revenues was more than offset by increases in Europe and Asia.

#### Investment Banking

The general market environment and Lehman's second quarter results were very

strong. Investment Banking had record revenues of \$1.2 billion, up 35% over the first quarter and up 55% over the second quarter of the prior year, with each of the three businesses within investment banking posting record revenues. There was a continued increase in “big ticket” transactions, i.e. sizable revenue generators as well as large total dollar sized, with Lehman participating in a larger number of these transactions.

Debt origination revenues of \$540 million, up 26% from revenues of \$428 million in the first quarter of 2007 led the way. The credit markets proved to be very resilient despite the events in the subprime market. There was heavy volume of high yield and leveraged loan activity along with robust investment grade issuance. Results in leveraged finance were a record and up substantially over the first quarter again driven by heavy financial sponsor related transactions and an increase in cross border activity highlighted by structured client solution transactions in Europe and Asia. Investment grade new issuance volumes remained strong benefiting from upbeat earnings and optimistic economic data announcements. High grade bond investors are now demanding extra protective provisions, including change of control covenants or poison puts due to the growth in LBO activity. Stock repurchases continue to be a theme this quarter as companies such as IBM and CVA Caremark access the debt market to finance share repurchases. The hybrid securities market, where Lehman is a leader, also reflected a resurgence as client demand for hybrid issuances is putting it on a pace for a 25% increase over the 2006 record year. An abundance of loan product fueled strong issuance of CLOs.

Equity origination record revenues of \$333 million were up 90% over the revenues of \$175 million in the first quarter and 60% over the prior year quarter as Lehman substantially outpaced the market in volume growth. Results were driven by a strong IPO market led by client solutions transactions including financial sponsor monetizations and strong global IPO activity. Convertible and Block activity were also particularly strong. Lehman had two marquee Asian transactions: CITIC Bank IPO, the firm’s first book run deal on the HKSE, and a joint book role on a \$1.5 billion convertible offering for Sinopec, the largest ever China convertible issuance. M&A record revenues of \$277 million were up 12% over the \$247 million of M&A revenues in the first quarter of 2007. Lehman was advising on three of the top four transactions in the quarter including ABN Amro, Alcoa, and Indessa.

These record M&A results reflect Lehman’s strategy of focusing on financial sponsors and developing markets. With regard to the financial sponsor focus, Lehman is currently advising on seven of the largest fifteen sponsor led transactions announced this year. The developing markets focus has resulted in the completion of significant transactions in China, the Middle East, and Eastern Europe.

Volume and fee pipeline for each of the three investment banking businesses, M&A, equities and debt are at record levels. Fee backlog is \$1.6 billion, double the amount at the beginning of the year.

### Investment Management

Investment Management reported record revenues of \$768 million, up 11% over the \$695 million reported in the first quarter of 2007. The performance was driven by record revenues in both Asset Management and Private Investment Management.

Assets under management grew to a record \$263 billion.

We were given a heads up to expect new products coming out of Europe and Asia as a significant amount of hiring has been done. New Product launches are included on the new product page in the book.

Lehman is heavily investing its own money in a number of these, such as \$200 million in a \$500 million June IPO private equity fund whose shares will be listed on Euronext Amsterdam, \$285 million from Lehman Brothers and its employees in the Lehman Brothers MLP Opportunity Fund which closed on June 1, 2007 with about \$685 million of commitments, and a number of other fund investments of less than \$50 million each.

### **Acquisitions/Private Equity Investments**

Lehman continues to be very active pursuing acquisitions and private equity investments.

- Regarding Lehman's minority investment in GLG, Grieb stated that the firm currently expects to recognize a \$390 million gain in 4Q07 from their investment in GLG Partners, which the firm expects to be liquidated when GLG accesses the public markets through a reverse acquisition with Freedom Acquisition Holdings, Inc. GLG is one of the world's most successful multi-strategy asset managers with an experienced team of highly-regarded investment professionals and a history of strong and sustained investment performance.
- The purchase of a 20% minority interest in D.E. Shaw for \$784 million in cash was closed on March 13, 2007. There are additional estimated earnout payments that could total over \$350 million through 2012. Lehman stated that the plan is not to acquire all of D.E. Shaw but to own a minority interest. This is part of Lehman's private equity, strategy and adds D.E. Shaw to the list of investment firms in which Lehman owns an interest including GLG Partners, Marble Bar Asset Management, Ospraie Management and Spinnaker Capital.
- Other closed deals in the 2Q07 included Grange Securities, where a 100% ownership interest in this Australian full service broker dealer specializing in fixed income was acquired.
- A minority interest in Wilton Re, a stock life insurance company located in Wilton, Conn. was also acquired. Lehman initially got a 17% interest for a \$100 million investment which will grow to 35% if all of the \$300 million is paid in. Lehman also has an option to purchase all of the remaining shares of Wilton Re in 2009.
- Lehman acquired a 50% interest in LBAIM for \$63 million from E&E Capital Advisors in march 2007. LBAIM is a fund of hedge fund business with



approximately \$3.5 billion of AUM.

- Lehman agreed to acquire Eagle Partners, significantly expanding the global energy and commodities platform during the quarter.
- The potential acquisition of a regulated broker dealer in India was mentioned as being in the early stages. The estimated cost would be in the \$40 million to \$50 million range.
- The purchase of a Turkish bank for about \$5 million to \$10 million was under consideration to get a license to do banking business in Turkey.

### **Special Topics**

Treasury had five special topics on the agenda. Unfortunately we were not able to review them all because of time limitations. There were presentations and discussion on the following:

- Appropriateness of inclusion in the Holding Company Liquidity Pool of LBHI deposits in Lehman Brothers Bank, FSB, which is an affiliate. This is the continuation of a prior discussion with neither side changing their positions. The conclusion that a follow up conference call involving Matt was the next step.
- Conduit Financing: Hudson Castle Structure. Lehman has entered into a transaction with Hudson Castle which will provide committed contingent liquidity in the event of a draw on a designated loan commitment. Loans typically will be acquisition loans or single name loans. This structure is to provide liquidity in the event the syndication is delayed or fails. The facility could provide an additional \$6 billion in liquidity support.

### **Capital Charges for Commitments and Archstone Presentation**

A presentation was made on capital charges related to commitments and using summary information relating to the Archstone deal to demonstrate capital charges for the related commitments under the two options, the banking book and the trading book. It was concluded that the matters should be discussed further with Matt in a conference call.

### **Matters for Follow Up**

- In reviewing the analysis of long and short inventory owned, we requested a more detailed breakdown of the following lines: US Securities, Non-US Securities and CMOs for this quarter and for each quarter in the future. Ed said that such detail was available and could be easily provided.
- The organization, agenda, and timing for the meeting are being reviewed. The emphasis will be on liquidity and funding, and the reviews of firmwide and business results. Capital matters will be addressed in the monthly meetings. The objective is to achieve the appropriate coverage in a reasonable length of time, i.e. 4 to 4 ½ hours.
- Follow up call relating to the appropriateness of inclusion in the liquidity pool of holding company deposits in an affiliated bank

- Follow up call relating to capital charges for commitments and the Archstone deal
- In the future request that they provide quarterly the details of the components of short term borrowing on the balance sheet.

### **Trends**

- The credit markets continue to be volatile following the sup-prime turmoil in late February and March. The markets were returning to January 2007 levels until the late June when BSAM again caused spread widening and increased volatility.
- It appears that the market is demanding a premium for brokerage debt until sub-prime fears are resolved.
- The CSE firms have moved to the sidelines for long term debt issuance when the credit markets become very volatile as they did in late February/March and in late June. Since liquidity is good, they have been able to stay on the sidelines until they longer term credit markets begin to return to normal and rates and spreads moderate.
- Less liquid assets continue to increase significantly driven by commercial whole loans related to acquisition financing and financing for real estate projects.
- The prime broker business continues to grow globally. This is generating increased revenues as well as using significant balance sheet as the CSE firms provide secured financing.
- The pipeline for M& A and financial sponsor activity remains very strong, particularly outside of the U.S. As long as there continues to be large amounts of cash available to invest, firms are optimistic about closing deals despite tougher investor demands for increased returns.

## **LEHMAN BROTHERS**

### **FINANCIAL REVIEW – QUARTER ENDED AUGUST 31, 2006**

#### **NOTES OF THE MEETING OF OCTOBER 20, 2006**

##### **Liquidity and Funding**

The liquidity pool at the holding company totaled \$28.5 billion at the quarter ended 8/31/06 compared to \$22.2 billion at the quarter ended 5/31/06. The \$6.3 billion increase was primarily driven by an increased issuance of long term debt. Lehman's MCO model, which sizes the liquidity pool and is calculated on a daily basis, has been requiring increases in the liquidity pool size because the firm is experiencing increasing short term debt obligations such as a larger roll of long term debt into short term debt, i.e. maturing in less than one year, as a result of the increasing amounts of long term debt that the firm has issued over the past several years and slightly higher amounts of short term structured notes. Since the year ended 11/30/05, Lehman's liquidity pool size has been increased by \$11 billion.

The largest part of the \$6.3 billion increase in the liquidity pool came from \$5.8 billion increase in boxed inventory led primarily by a large increase in agency MBS. The \$28.5 billion liquidity pool at 8/31/06 included \$9.7 billion of Treasuries and Governments securities, \$7.3 billion of Agency MBS, and \$6.1 billion of Agencies.

Long term debt of \$7.8 billion was issued in the third quarter bringing the total for the first three quarters of the year to \$32.1 billion as markets remained generally favorable with very little spread widening (1-4 bp) in the brokerage sector. Long term debt issued in all of 2005 totaled \$22.6 billion. Growth in long term debt has matched the growth in the balance sheet and equity. The rate of long term debt issuance eased up in the third quarter as demand for funds from the businesses was not as strong as it had been in the torrid period during the spring. Funding from securitizations also picked up providing funds. Funding required for ramp up of positions was less in the third quarter. The plan for the fourth quarter is to issue \$7 billion of debt of which half is for business growth and half relates to roll. The diversification plans noted in prior quarters was implemented as the firm issued subordinated debt for the first time and geographically diversified with relatively small issuances in Australia, Canada, and Switzerland.

Treasury has changed the way it reports outstanding long term debt to coincide with the way it is reported in the financial statements. The current portion of long term debt is now being reported as a part of short term debt and excluded from long term debt. While the firm views this as a positive change it combines the current portion of long term debt with CP and other short term debt making it more difficult to quickly and easily view changes in CP and other short term debt.

## **Cash Capital**

The cash capital surplus was \$4.7 billion at 8/31/06, down \$2.7 billion from \$7.4 billion at the 5/31/06 as cash capital uses were greater than sources for the quarter. The \$7.4 billion excess was relatively high and well above the firm's targeted surplus of \$4 billion.

Cash capital usage increased to \$89.3 billion at 8/31/06, up \$3.2 billion from \$86.1 billion the prior quarter. The increase in usage was driven by a \$2.1 billion increase for less liquid assets to \$42.4 billion, \$24.5 billion of which is for commercial and residential whole loans which is down from \$25.2 billion at 5/31/06. Cash capital requirements for liquid assets also increased by \$2.0 billion as collateral was held at the end of the quarter related to a risk arb trading strategy. That collateral has since been released and repoed out.

## **Balance Sheet**

The firm expectation for balance sheet growth has increased to 24% for the year 2006, up from 15% the last quarter, with 86% of the growth coming Fixed Income Division Core Products and Capital Markets Prime Services. Net balance sheet growth is expected to account for 60% of the total growth. Net leverage at the end of the quarter was 13.5x and within the targeted level of below 14.0x.

Total assets were \$474 billion at 8/31/06, up \$18 billion from \$456 billion at 5/31/06. Long inventory positions increased \$7.1 billion led by \$3.7 billion increase in asset backed positions. Short inventory positions were flat. Collateralized agreements, reverse repos, were up \$15.5 billion while customer receivables declined \$5.8 billion from the high levels related to the end of June dividend payment period.

Stockholders' equity increased \$414 million during the quarter to \$18.4 billion at 8/31/06. While the firm had good earnings for the quarter of \$916 million, stock buybacks were a little larger than normal, and employee stock options exercised were down in the third quarter.

## **Looking to Adopt Fair Value Accounting Pursuant to FAS No. 157 in 1Q2007**

Although a final decision has not been made per Ed Grieb as to when Lehman will adopt Fair Value accounting pursuant to FAS No. 157, it was evident in the meeting that it is widely anticipate that Lehman will early adopt effective December 1, 2006, the beginning of the first quarter of the new fiscal year 2007. Grieb stated that a final decision as to when to adopt had not been made as the details as to what actions by the firm are required to early adopt the standard are extensive and still being studied. Lehman is not required to adopt FAS No. 157 until the fiscal year beginning December 1, 2007. So they can wait a year if they so chose. Among other things, FAS No. 157 eliminates the Day One revenue recognition issues created by EITF 02-3, which has been

highly controversial every since its release in 2002.. While Grieb cautioned about jumping to a conclusion at this time, it was obvious that other knowledgeable people at the meetings expect the firm to early adopt as of December 1, 2006.

### **Disclosure of CSE Capital Ratios**

Lehman asked about the disclosure of CSE capital ratios and other Basel related information. They recently participated in a bond analysts meeting recently where the analysts were eager to have the Basel ratios and other related data disclosed. They were told that we would prefer not to disclose those ratios at this time. Further discussions are planned.

### **NAIC Position on Lehman ECAPS/Hybrid Capital Markets**

The managing director for Hybrid Securities updated us on significant developments relating to the NAIC position on hybrid securities. On 3/15/06 the NAIC Securities Valuation Office had classified the \$300 million Lehman ECAPS securities issued in 08/05 as equity instead of debt or preferred along with numerous other hybrid securities that had been issued by others. This seriously impacted the hybrid securities markets and Lehman revenues by substantially reducing interest in hybrids as it caused insurance companies to treat these securities as equities with much higher risk-based capital charges than would have been required if they were classified as debt. On 9/12/06, NAIC changed its position to allow all hybrid securities to be reported as preferred stock, which have much lower risk-based capital charges than equities. Lehman reported that this change has very favorably impacted the hybrids market, there has been a "hugh" issuance volume of hybrids since the 8/31/06 quarter end, and volumes have been pushed up considerably with Lehman in the thick of the activity.

### **Subordinated Debt Issuance**

Lehman's subordinated debt issuance plan for the rest of 2006 and 2007 was reviewed. Lehman recently began issuing sub debt in anticipation of the CSE capital requirements eliminating the grandfathering of long term debt. Lehman plans to issue \$8 billion of sub debt by 12/1/08 which is an average of \$1 billion per quarter. The estimated additional cost of issuing sub debt vs long term debt is expected to be 10-15 bp. On 9/14/06 Lehman issued 750 million Euros of 4.25% 10 year non call 5 years sub fixed-floating step up bonds. The offering was substantially over subscribed. The additional cost of the deal was estimated at 15 bp. Following the first issue, Lehman again issued sub debt in the U.S. with a \$1.2 billion 5.75% 10 year bullet fixed rate offering. The incremental cost of this offering was estimated at 8 bp. With sub debt issued in excess of \$2 billion, Lehman does not expect to be back in this market for the rest of this year.

## **Operating Performance Review**

### **Total Firm**

Lehman Brothers Holdings, Inc. again had a strong quarter as the firm's net income of \$916 million and EPS of \$1.57 were the best third quarter ever. Revenues were over \$4 billion for the third consecutive quarter. These results compare to second quarter net income of \$1 billion and EPS of \$1.69. The third quarter revenues of \$4.2 billion were strong in view of the seasonality and the volatility in the markets. The volatility came primarily from geopolitical events, higher oil prices, wider credit and investment grade spreads, and flattened yield curves. Return on equity was 21.0% versus 23.7% for the second quarter of 2006.

<u>Financial Information</u>	<u>3Q06</u>	<u>2Q06</u>	<u>YTD2006</u>	<u>2005</u>
Total Net Revenues (\$ in mil)	4,178	4,411	13,050	11,576
Net Income (\$ in mil)	916	1,002	3,003	2,369
ROE (%)	21.0	23.7		17.9
Comp Ratio (%)	49.3	49.3	49.3	49.5
Total Assets (\$ in mil)	475,000	456,202		
Long-term debt	-----	81,379		
Total Stockholders' Equity	18,396	17,982		
Total Capital	93,866	90,502		
Gross Leverage Ratio	25.1x	24.4x		
Net Leverage Ratio	13.5x	13.6x		

### **Business Overview**

Lehman Brothers reports operating results in three business segments: (1) Investment Banking, (2) Capital Markets, and (3) Investment Management.

#### **Investment Banking**

Investment banking revenues for the third quarter decreased to \$726 million from \$741 million in the second quarter, down 2%. However, the investment banking fee pipeline remained at record levels although the volume pipeline was not at record levels. Overall, origination fell as credit spreads widened. Equity IPOs decreased as deals were put on hold or pulled. Advisory services fees were down to \$195 million in the third quarter from \$244 million in the second quarter. The decrease in advisory revenues is not considered indicative of a trend, but is more related to the timing of the consummation of transactions. These decreases were offset by an increase in fixed income origination. Debt underwriting was up 20% over the second quarter driven primarily by high yield and leveraged loan transactions dominated by sponsor activity. Additionally, August was a surprisingly favorable environment as many financial institutions issued debt.

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## Capital Markets

Capital markets revenues declined 8% to \$2.8 billion for the third quarter compared to a record \$3.1 billion for the second quarter. Fixed income revenues were \$2.0 billion in the third quarter, down from the record \$2.2 billion for the second quarter. Both commercial and residential real estate revenues from securitizations continued to be strong. The CMBS business has been strong all year long for Lehman with the third quarter CMBS business at all time record levels for the firm. The U.S. residential mortgage business was solid but softened compared to prior periods. The firm had record mortgage revenues outside of the U.S. Structured derivative revenues were strong in both fixed income and equities. This was a very challenging period for equities as valuations were flat for most of the period and lower seasonal activity during summer. Despite the environment, third quarter equities revenues were \$837 million compared to \$878 million in the second quarter of 2006, down 5%. The cash business was one of the strengths in equities reflecting high customer flow business, especially in Europe and on NASDAQ. Prime brokerage had record revenues as Lehman's efforts to expand this part of the business paid off adding new clients and growing the business of existing clients.

Prime services revenues were \$234 million for the quarter, up 21% from the prior quarter. Prime services America and Asia revenues were driven by stat arb while yield enhancement was the primary driver in Europe.

Private equity had gains of \$54 million, up from the \$21 million in the second quarter.

Lehman had \$225 million of EITF 02-3 revenues released in the third quarter reflecting intensified efforts relating the close review of the observability of the day one hold back of non-observable profit in anticipation of the implementation of SFAS 157, the new fair value standard, where the transition rules do not allow revenue recognition of the profit held back for the non-observable revenue that has been deferred but requires that it be recorded as an adjustment to opening retained earnings, i.e. run directly through equity. Lehman expects to adopt SFAS 157 effective December 1, 2006 which is the beginning of the new fiscal year.

## Investment Management

Investment management continued its steady growth as revenues were \$605 million compared to \$592 million in the second quarter of 2006. Revenues from both asset management and private investment management were up again this quarter.

Assets under management again were a record \$207 billion, up from \$198 billion in the prior quarter, with all asset classes showing increases.

## Other Matters

An IRS assessment for the tax years 1997 – 2000 was disclosed in the 10-Q. Lehman believes they are adequately reserved but the estimated contingency may be another \$100 million depending on the resolution of the disputed items.

## TRENDS

### Overall

- Earnings continued to be strong – best third quarter ever
- ROE strong at 21%
- Revenues were strong in view of the seasonality although not a record
- Mortgage business trend continues to be softer
- Investment banking continues at or near record levels
- Debt underwriting - up 20% sequentially
- Equity underwriting – down 12 % sequentially reflecting a less favorable environment as global markets were more volatile
- AUM continues to trend up – good growth and inflows
- M&A was down 20% sequentially for the quarter

### Investment Banking

- Overall, origination fell as credit spreads widened
- Equity IPOs decreased as deals were put on hold or pulled.
- An increase in fixed income origination. Debt underwriting was up 20% over the second quarter driven primarily by high yield and leveraged loan transactions dominated by sponsor activity.
- August was a surprisingly favorable environment as many financial institutions issued debt.
- Advisory services fees were down.

### Capital markets

- Overall, revenues down slightly
- Commercial and residential real estate revenues from securitization activity remain strong, although U.S. residential business softened.
- CMBS has been strong all year
- Structured derivatives were strong in both fixed income and equities
- Challenging period for equities as valuations were flat
- Cash equities business was strong reflecting strong customer flow business, especially in Europe (surprising since it was summer) and NASDAQ.
- Prime Brokerage had record revenues.

### Investment Management

- Steady growth in revenues and AUM continued

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### General

- EITF 02-3 deferred revenues being released in anticipation of the adoption of the new fair value standard effective 12/1/06 which is the beginning of the new fiscal year.

### Follow Up

- Moodys and Fitch raised the long term debt outlook for Lehman to positive. Nahill is to provide a copy of the reports of each. These were received.
- Need stock repurchase plan and activity in future packages

### Topics for the Next Meeting

- Contingency Liquidity Framework
- 2007 Capital Plan and Issuance Plan

## LEHMAN BROTHERS

### FINANCIAL REVIEW – QUARTER ENDED August 31, 2007

#### NOTES OF THE MEETING OF SEPTEMBER 25, 2007

##### Liquidity and Funding

###### General

There have been significant concerns about the liquidity of the CSE firms, including Lehman Brothers Holdings, Inc, since the onset of the volatility in the credit markets beginning the last week of July when the medium and long term debt markets shut down, which followed the initial market reaction to the subprime mortgage turmoil that occurred during May and June. In August, the volatility in the credit and subprime markets spread to the commercial paper and repo markets as rates spiked expanding the credit crisis not only in the U.S. but also in Europe as the debt spreads curve became inverted, particularly at the short end. Lehman debt spreads, along with other brokerage spreads, widened out significantly beginning the last week of July and into August as the spreads of Bear Stearns and Lehman took the biggest hits. In late August, the markets began to reopen but at significantly wider spreads than where issuers had previously borrowed. The CSE staff has been having calls with the Lehman Treasurer and Assistant Treasurer at least weekly since the last week of July to review the firm's current liquidity, liquidity planning, availability of overnight and longer term funding, market conditions, conduit activity, commitments, and other obligations and contingencies that have current or potential cash requirements. Throughout this period, Lehman has maintained adequate liquidity. The Treasurer stated the Lehman has recently sought to buy back some of their outstanding paper in view of the wide spreads, but there is not much available.

During the week of September 17<sup>th</sup>, several important events occurred which significantly improved market conditions. Four of the five CSE firms reported third quarter earnings led by Lehman who reported first on Tuesday, September 18<sup>th</sup>. The earnings were generally good, although those of Bear were weak as had been anticipated. This was positive for the markets. This was followed on Wednesday by the Fed's announcement of a 50 bp rate cut, which was also positive for the markets and has contributed to the improvement.

Given that the liquidity in the markets is improving, although it still has not returned to normal, these discussions and calls will be held at least monthly going forward. The next call is scheduled for 10/15. Treasury is to advise if significant matters or events occur in the interim.

###### Liquidity Pool

The liquidity pool at the holding company totaled \$33.6 billion at the quarter ended 8/31/07 compared to \$23.4 billion at the quarter ended 5/31/07 as the Treasurer

and the Firm sought to present a strong liquidity position at the end of the quarter. The \$33.6 billion is the Lehman Liquidity Pool size as viewed by the SEC. The \$33.6 billion reflects a \$2.3 billion reduction for assets held in the Aegis conduit which Lehman counts as part of their liquidity pool. Lehman viewed their Liquidity Pool value to be \$36 billion at the quarter end (\$33.6 bil + \$2.3 bil rounded up). We do not agree with Lehman that the \$2.3 billion of assets in the Aegis conduit should be part of the holding company liquidity pool. The Aegis conduit is a separate legal entity and the assets are not available to the holding company to meet all holding company obligations.

The Liquidity Pool was increased \$10.4 billion above the prior quarter amount to increase holding company liquidity and address liquidity concerns and possible needs of the firm in view of the liquidity stress in the credit and subprime markets occurring during late July, throughout August, and into September.

The \$33.6 billion Liquidity Pool at 8/31/07 was comprised of \$2.9 billion of cash and \$30.8 billion of boxed inventory consisting primarily of \$20.6 billion of Agency MBS, \$5.5 billion of Treasuries and Govies, \$2.7 billion of equities, and \$1.7 of corporate bonds.

#### Funding and Long Term Debt Issuance

Lehman issued \$17.5 billion of unsecured long term debt during 3Q07, compared to \$17.8 billion of long term debt issuance during 2Q07. Much of the debt issuance came early in the quarter during June and early July. The most notable public debt issuance came on July 13<sup>th</sup> when \$5 billion of fixed rate notes were issued including \$2 billion of 10 year notes, \$1.5 billion of 5 year notes, and \$1.5 billion of 30 year notes. Structured notes amounting to \$5 billion were also issued. Although spreads on the structured notes were increased during the quarter, they were still inside of secondary levels by 50bp to 100 bp. Current flow of structured note issuance at the end of the quarter was approximately \$200 million per week.

Additionally, the full \$2.5 billion of the European Committed Credit Facility was drawn down during the quarter and not repaid at 8/31/07. Normally Lehman fully repays all draws on its two committed credit facilities at quarter end. Subsequent to the end of the quarter, the \$2.5 billion was fully repaid and both committed facilities were undrawn at the time of this meeting.

Funding requirements continued to be significant during the third quarter as the cash capital requirements were \$15.0 billion compared to \$16.7 billion in the second quarter. Treasury funded the increased cash capital requirements primarily by issuing \$17.5 billion of unsecured long term debt.

Following the end of the quarter on September 19, Lehman issued \$3.25 billion of senior fixed rate notes. This included \$2.25 billion of 7 year fixed rate notes priced at Treasuries + 190bps (1ml + 128.5 bps), and \$1 billion of 20year fixed rate notes at Treasuries + 220bps (1ml + 167.5 bps). Lehman had been out of the credit markets for a

long time having last issued in the second week of July. Paolo stated that there was a strong demand for the deal with the final book coming in with over \$8 billion in orders. The down side is that spreads had subsequently narrowed by 15 – 20 bps at the time of the meeting and have gradually continued to slowly tighten. Paolo stated that the feeling is that they could do a 5 year issuance in significant size if they wanted to but they don't need to issue. He wants to wait until spreads tighten further.

### Cash Capital

The \$8.1 billion of excess cash capital at 8/31/07 was up \$5.6 billion over the \$2.5 billion at 5/31/07 at the firm sought to present a strong liquidity position at the end of the quarter. The increase in the excess cash capital was driven to a significant degree by \$6.7 billion in funding from facilities, including the \$2.5 billion drawn on the European facility that was not repaid until early September. The details of the \$6.7 billion of funding from facilities is as follows: \$2.5 billion from the European facility, \$2 from Racers, \$1 billion from State Street, \$1 billion from Dresdner, and the remaining \$300 million relating to smaller amounts of activity involving four other facilities.

### Less Liquid Assets

The increased funding and cash capital requirements were driven primarily by a \$12.3 billion increase in less liquid assets. Cash capital requirements for commercial and residential whole loans increased by \$5.4 billion to \$42.2 billion. Cash capital requirements for corporate loans also increased by \$3.8 billion to \$16.9 billion while additional cash capital trapped in regulated entities (mainly LBIE) increased by \$3.5 billion. This was partially offset by a \$3.7 billion decrease in cash capital requirements related to margin requirements, mostly related to uncollateralized receivables for OTC derivatives.

The \$5.4 billion increase in funding requirements for whole loans related primarily to commercial whole loans. Real estate projects requiring larger amounts of funding included \$2.7 billion for Northern Rock's entire commercial real estate portfolio. The total purchase price was \$3.3 billion but the net funding required was \$2.7 billion. The portfolio contains 1159 fixed and floating rate loans backed by 2000 properties with a weighted average LTV of 68% and is diversified by asset type. The exit strategy is to securitize in Nov 2007. Other third quarter funding requirements included \$900 million for the Dermody Portfolio, \$500 million for Grand Prix, and \$400 million for Goodwater Advantage which was two German office portfolios.

Corporate loans requiring larger amounts of net funding in the third quarter included \$800 million for Allison Transmission, \$400 million for Golden Tree, \$300 million for U.S. Investigations Services, \$300 million for Home Depot supply, and \$250 million for Oz Management.

Prefunding of loan commitments also increased to \$3.4 billion, up \$1 billion over the prior quarter with the \$600 million prefunded for Imperial Tobacco being the largest

requirement.

Conduit activity was also reviewed. Lehman continues to have limited involvement and exposure compared to several other CSE firms. Nahill stated that Lehman still considers conduits as a viable source of future funding although under different terms. In discussing the possible use of conduits in the future, he pointed out that the conduits can fulfill financing needs, such as cheap funding and off balance sheet financing. But Lehman Treasury would not use conduits under the terms and structure that exists today. Future conduits would have to be structured differently to include immediate funding, full term or longer term (12 months) funding, committed financing. Lehman would also only deal with reputable sponsors. It was noted that some of the less reputable sponsors or weaker structures have been going away or will have difficulty surviving this market stress. Use of conduits for additional funding is currently NOT in the Lehman funding plan. Nahill also stated that Lehman has not been pleased with the performance of Lloyds as a backup liquidity provider in the Hudson Castle facility, and would not do business with Lloyds in similar circumstances in the future.

#### High Yield Contingent Acquisition Facilities

Leveraged loan commitments, or High Yield Contingent Acquisition Facilities as Lehman calls them, declined significantly from the prior quarter. Lehman's total high yield acquisition commitments at 8/31/07 was \$27.0 billion including \$5.4 billion for Archstone and \$1.6 billion for Hilton. This compares to commitments of \$43.9 billion at 5/31/07, a net reduction of \$16.9 billion in commitments. During the quarter Lehman signed \$10.3 billion in additional high yield commitments which are included in the net reduction of \$16.9 billion noted above. So, if the net reduction for the quarter was \$16.9 billion and Lehman signed \$10.3 billion in additional commitments during the quarter, which means that \$27.2 billion of commitments at 5/31/07 went away. There are a number of reasons for the \$27.2 billion reduction, as noted below:

Deals completed	\$9.6 bil
Syndicated/paired down	\$9.4 bil
Third party sales	\$4.1 bil
Deals lost/ done away from	
Lehman	\$2.1 bil
Lehman conduit	<u>\$2.0 bil</u>
Total Reduction	\$27.2 bil

At 8/31/07 Lehman had funded on balance sheet deals (HY acquisition commitments) of \$7.6 billion. This included \$4.0 billion currently funded and on balance sheet related to the 5/31/07 where the commitments totaled \$11.4 billion. The remaining \$3.6 billion of funding related to deals committed to during the third quarter. The three largest funded commitments were: Home Depot Supply for \$2.1 billion, Allison Transmission for \$1.0 billion, and US Investigative Services for \$600 million. Subsequent to 8/31/07, there have been two Lehman-led syndications of Allison for \$1 billion and \$500 million of which Lehman's part is 25% or \$375 million. Lehman

continues to look to its three banks as a significant source of funding where the firm has to fund deals and to use the holding company and the liquidity pool as a source of funding only as a last resort.

While the terms of the commitments differ somewhat, Paolo noted that virtually all of Lehman's commitments have business MACs. None of the commitments have market MACs. Lehman has and expects to continue to use every opportunity to exercise the business MAC to restructure a deal or get out of unfavorable deals, as evidenced in the Home Depot Supply and Harman International deals where the company's performances dropped. The Home Depot Supply deal was substantially restructured while the Harman deal was called off. New High Yield Contingent Commitments would likely have full flex pricing, a complete covenant package, structural flex and other conditionality. Potential new cash acquisitions may include financing outs.

Total bridge equity amounted to \$1.1 billion at 8/31/07. The \$1.1 billion was made up of TXU Corp of \$500 million, Harman International of \$322 million, and First Data of \$20 million.

Lehman's policy is to mark its commitments to market and to the extent a loss is greater than the financing fees, they record the mark to market loss. At 8/31/07, Lehman had mark to market losses on 30 of the 41 commitments. For the quarter, the net mark to market loss of \$703 million reflected mark to market losses of \$1.3 billion which were partly offset by \$437 million of financing fees, \$54 million of closed M&A fees, \$13 million of net carry gain, and \$ 87 million of hedging profits through 8/31/07.

Estimated CSE capital allocated to the Contingent Acquisition Facilities at 8/31/07 was \$840 million.

#### Contingent Liquidity Risk Management

Throughout our numerous discussions of Lehman's liquidity, Lehman has placed heavy reliance on their three banks to provide funding where it is necessary for the firm to fund deals. Treasury provided some insight into the banks roles in liquidity risk management. While the SEC staff has focused much of their attention on high yield commitments, or High Yield Contingent Acquisition Facilities as Lehman calls them, Treasury provided a broader view of their contingent Liquidity Risk Management Plan. The management of the liquidity risk related to the uncertainty around financing activity related to all loan commitments and contingent loan commitments was reviewed. This included unfunded high grade commitments, unfunded high yield commitments, contingent high grade acquisition facilities and contingent high yield acquisition facilities.

Unfunded High Grade Commitments amounted to \$27.0 billion against 200 plus counterparties at 8/31/07. \$15.2 billion of these commitments have been originated at the three Lehman banks which are able to fund up to \$625 million per name. While the U.S. banks have to perform their due diligence prior to commitment, Bankhaus can do post

commitment due diligence. The three banks have a FHLB line of \$1 billion, access to the Fed discount window, and the ECB, and have been able to raise funding in the CD markets of over \$1 billion per week. Lehman has \$3.3 billion of prefunding across Holdings and the banks. There is also a \$5 billion facility in place with a third party bank prefunded to \$2.4 billion.

Unfunded High Yield Commitments amounted to \$11.5 billion against 250 counterparties. This included \$9 billion of high yield loan revolvers as well as approximately \$2 billion of real estate, ABS, and CDO related loans commitments. Draws on high yield revolvers have been small including no daily draws during the past nine months greater than \$100 million. At 8/31/07, there was \$1.5 billion of the commitments held at the Lehman banks which are able to fund up to \$400 million per name. Funding requirements above that go to the holding company. Aegis is a \$2.3 billion high yield funding facility through a third party bank that is available to fund these commitments. Historical analysis over the past two years has shown draws of high yield facilities to be a maximum of 20% year on year.

Contingent High Grade Acquisition Facilities amounted to \$5.1 billion against 6 counterparties at 8/31/07. These commitments can all be placed in the firm's banks which have a combined loan to one borrower limit of \$625 million. Important to note is that even in the current market environment, there has been success at syndication of high grade credit. Lehman also has a conduit structure backed by a third party bank that has \$2.5 billion of prefunding.

The Contingent High Yield Acquisition Facilities total \$27.0 billion against 29 counterparties as discussed in the section above. Lehman's expected allocation and funding requirement is lower than this reported amount for the reasons discussed above. The capacity of the banks to take high yield counterparty loans is limited to \$400 million. Lehman has a \$7.5 billion funding facility for high yield contingent commitments in addition to \$5.3 billion of committed long-term facilities that can be used if necessary to fund these requirements.

Lehman's three banks are: (1) Lehman Brothers Bank, a U.S. thrift, (2) Lehman Brothers Commercial Bank, a U.S. industrial bank, and (3) Lehman Brothers Bankhaus, a German Bank. All three are regulated and able to source low cost funding. LBB and LBCB generally source deposits from U.S. retail customers while Bankhaus primarily sources deposits from commercial customers. At 8/31/07, LBB had total assets of \$17.7 billion and deposits of \$12.2 billion, LBCB had total assets of \$5.5 billion and deposits of \$3.9 billion, and Bankhaus had total assets of \$20.2 billion and deposits of \$9.5 billion. Lehman affiliates had \$670 million deposited in the banks. All three banks have excess capital and have been successful in raising funding, including the issuance of CDs, during this liquidity stress event. While certain members of the SEC staff have frequently expressed concern about the suitability of leveraged loans and less liquid assets funded by these banks, the firm has clearly stated that these banks primarily fund less liquid assets which are otherwise funded by long term debt or secured funding. Lehman's banks funded \$8.6 billion of new corporate loans and commercial whole loans in the third

quarter. The plan is for these banks to fund \$8.1 billion of new loans in the fourth quarter.

### Leverage

Net leverage was up to 16.1x at 8/31/07 from 15.4x for both 5/31/07 and 2/28/07, well above the beginning of the year target of 14.5x and up from the 13.5x level of prior years. The firm is willing to allow the leverage to increase in 2007. Treasury has asserted that most the assets financed by the additional debt are liquid assets, including broker margin loans and inventory positions. Treasury continues to discuss the increased leverage with the rating agencies as well as the regulators, with no significant push back from the rating agencies.

### Balance Sheet

Total assets were \$657 billion at 8/31/07 compared to \$606 billion at 5/31/07, up \$51 billion or 8.4%. The increase was driven by a continuing increase in balances for securities borrowed of \$16 billion to \$142 billion attributed to equity financing for hedge funds. Reverse repos balances were up \$14 billion to \$145 billion, attributed primarily to fixed income hedge fund activity.

Long inventory positions were \$300 billion, up \$15 billion driven primarily by a \$8.1 billion increase in derivatives, a \$6 billion increase from corporate equities, a \$5.7 billion increase in mortgages, a \$4.2 billion increase in real estate held for sale, and partially offset by a decrease of \$8 billion in Government and Agencies, and a decrease of \$3.4 billion in Corporate debt related primarily to a decrease in German corporate debt. The \$8.1 billion increase in derivatives was driven by a \$4.8 billion increase in interest rate, currency, and credit default swaps and options primarily because of spread widening, and a \$2.4 billion increase in equity swaps, warrants and options led by increased in London listed options contracts. The \$6 billion increase in corporate equities was all in Europe and Asia. The \$8 billion decrease in Governments and Agencies reflected a \$3.6 billion decrease in the global rates business positions and a \$4.2 billion decrease in the mortgage business. The \$3.4 billion decrease in corporate debt securities was net of a \$6.2 billion decrease in non U.S. corporate debt.

Bank deposits increased by \$3.2 billion during the quarter to \$24.9 billion at 8/31/07 as Lehman actively sold CDs to both retail customers in the U.S. and commercial customers of Bankhaus to raise cash in the banks.

On the liabilities side, short inventory positions decreased \$27 billion from the prior quarter to \$141 billion. The decrease was driven by a \$15.8 billion decrease in shorts in Governments and Agencies primarily driven by less balance sheet sorting in the amount of \$7 billion by the Global Rates Business, and \$3.5 billion less of mortgage backed shorts. Shorts of U.S. equities was also down significantly by \$8.5 billion from 5/31/08 to \$10.6 billion related to prime broker stat arb yield enhancement trades. Shorts on corporate debt decreased by \$4.6 billion to \$8.6 billion driven primarily by a decrease



in shorts in the prop book.

Stockholders' equity of \$21.7 billion at 8/31/07 was up from \$21.1 billion at 5/31/07. Equity was increased by \$877 million of net income for the quarter, \$400 million of employee restricted stock, and \$25 million of stock issued in connection with the Eagle acquisition while decreased by stock repurchases of \$640 million and dividends of \$90 million.

## **Operating Performance Review**

### **Firm Overview**

Lehman reported significantly lower revenues of \$4.3 billion for the third quarter ended 8/31/07, down \$1.2 billion from the \$5.5 billion of revenues reported in the second quarter of 2007. The decrease resulted from the challenging market conditions in the latter part of the quarter, particularly in Credit and Securitized Products.

Third quarter net income was \$887 million, down from the record \$1.3 billion reported in the second quarter. ROE was 17.1 % in the third quarter vs. 25.8% in the second quarter.

Budgeted fourth quarter revenues are \$5 billion.

Regionally, 53% of revenues were generated outside of the U.S. although the losses related to the valuation adjustments for leveraged loans and the mortgage product markdowns were nearly all U.S.

Lehman recorded a \$700 million net loss for valuation adjustments on leveraged loan commitments and securitized products in Fixed Income Capital Markets. The firm recorded very large valuation reductions, mostly on leveraged loans and residential mortgage related positions. These losses were partially offset by valuation gains on economic hedges and FAS 159 mark to market gains on structured note liabilities. Included in this \$700 million net loss were FAS 159 market to market gains of \$850 million on Lehman's structured note liabilities, of which \$595 million of the gain was credited to Fixed Income Capital Markets and \$255 million credited to the Equities Capital Markets. With credit spreads tightening subsequent to the quarter end, it is likely that a significant amount of these gains will reverse in 4Q07 partially offsetting revenues. There are a number of components to the \$700 million net loss as described below.

For Leveraged Loans, the gross valuation adjustment was \$1.3 billion which was reduced by hedging gains and financing fees of \$537 million to arrive at a net loss of \$763 million. For Securitized Products, the gross valuation adjustment was \$1.47 billion which was reduced by hedging gains of \$1.318 billion for a net loss of \$152 million. The real estate valuation adjustment amounted to a charge of \$226 million while the adjustment for the warehouse portion of CLOs was a charge of \$107 million. There was

a charge of \$58 million for Muni basis trade losses. As mentioned above, Fixed Income Capital markets received credit for \$595 million of the total mark to market gain of \$850 million with the rest going to Equities. About \$600 million of the \$700 million net loss was booked in August, driven primarily by the blow out of AAA rated mortgage products spreads in mid-August reflecting the elevated systemic risk concerns related to the underlying credit quality of mortgages and related CDOs resulting in illiquidity in many of these products. This was coupled with the disappearance of investor interest leveraged lending as credit markets shut down.

### Capital Markets

Capital markets total revenues were down substantially, dropping to \$2.4 billion for 3Q07 from \$3.6 billion for 2Q07. Fixed Income Capital Markets revenues declined to \$1.1 billion for the quarter, down from \$1.9 billion the prior quarter driven by the impact of the \$700 million valuation adjustment discussed above. In addition to the markdowns related to the valuation adjustments, the Fixed Income businesses were challenged throughout the quarter with some performing well while most suffered revenue declines. The global rates business performed very well as 3Q07 revenues of \$487 million exceeded 2Q07 revenues of \$252 million driven almost entirely by the European derivatives desk, mostly on long EUR vega exposure as EUR vols rallied strong across the surface and on one large structured customer derivative trade that made \$140 million as vols spiked. The trade has now been taken off. Commodities trading also had a strong quarter with 3Q07 revenues of \$123 million, up from 2Q07 revenues of \$16 million driven by gold options trades from the EUR metals desk. FID Prime Services also had a good quarter as 3Q07 revenues of \$221 million were up from 2Q07 revenues of \$157 million driven by higher rates. For Credit Products, the losses were broader of course reporting 3Q07 revenues of \$90 million vs. 2Q07 revenues of \$466 million exclusion of losses from the valuation adjustments. High grade credit 3Q07 losses of \$87 million were down from 2Q07 revenues of \$79 million also reflecting losses related to long positions in the homebuilders sector and the autos sector. High yield credit 3Q07 revenues of \$73 million were down from 2Q07 revenues of \$210 million and CDO 3Q07 revenues of \$104 million were down from \$177 million in 3Q07. These Credit Product losses are exclusive of the losses from the valuation adjustments.

Securitized Products 3Q07 revenues were \$37 billion, down from \$213 billion in 2Q07 reflecting primarily MTM losses prime and subprime positions across the whole capital structure related to deteriorating market conditions and poor performance as well as rep and warranty reserve increases. The losses from the valuation adjustments are additional and reduce revenues further. Real Estate revenues for 3Q07 were \$308 million vs. \$487 million for 2Q07. Global Principal Strategies had 3Q07 losses of \$98 million vs. 2Q07 revenues of \$109 million.

Total Equities revenues for 3Q07 were \$1.4 billion, down from 2Q07 revenues of \$1.7 billion. This performance was viewed by the firm as there was a large decline in European Execution Services as 3Q07 revenues of \$92 million were down from 2Q07 revenues of \$209 million as principal trading revenues declined. Equity Strategies 3Q07

revenues of \$63 million were also down from 2Q07 revenues of \$140 million primarily because of reflecting losses in Europe as European markets ended lower. Equities Prime Services 3Q07 revenues were \$283 million, down from \$371 million in 2Q07 but up from \$234 million from the third quarter of the prior year. Hedge fund balances were down 10% in August but are back up 9% in September. Equity Global Trading Strategies also had 3Q07 losses totaling \$116 million vs. 2Q07 revenues of \$112 million. The above equity business revenues do not include any effect of the \$255 million FAS 159 mark to market gain that was credited to Equity Capital Markets.

### Investment Banking

While Investment Banking reported the second highest revenues ever for the 3Q07 at \$1.071 billion vs. \$1.150 billion for 2Q07, there was no celebrating for the pipeline was down 36% from the record levels at 2Q07 with all products down. Leveraged Finance was down sharply. Additionally, there were numerous leveraged finance commitments for which the firm was going to take a loss or significantly reduced fees. The leveraged finance commitments and related valuation adjustments have been discussed above. The impact is severe. This pull back on M&A and Financial Sponsor activity will likely result in more mid-cap deals (\$1-4 bil). Additionally, there will likely be more M&A activity in stock for stock transactions and greater use of balance sheet cash for acquisitions given the tight liquidity in the credit markets.

Investment banking is still expecting the large marquis hedge funds to come to market resulting from some of the new initiatives.

The third quarter revenues were driven by record advisory revenues and strong equity origination net revenues. M&A revenues were actually up to \$425 million in 3Q07 vs. \$277 million in 2Q07 as large revenue generating transactions were completed including some in adverse credit conditions, such as Home Depot Supply where the firm earned M&A fees of \$28 million. Other large M&A fee transactions included \$30 million from General Electric Supply sale of GE Plastics, and \$22 million from the Dollar General sale to KKR.

Equity origination revenues were \$296 million for 3Q07 vs. \$333 million for 2Q07 which were the two highest levels ever for Lehman with solid performances from the U.S. IPOs, derivatives, and private placements. June and July revenues were strong as volume was up.

The Leveraged Finance performance was down sharply with \$101 million of revenues in 3Q07 vs. \$274 million in 2q07. These results included a very favorable large commodity deal as well as several smaller ones. Linn Energy generated \$30 million of revenues.

Fixed income origination for the quarter was very challenging as negative events in the subprime market spread to the other debt markets. Investment grade new issuance decreased 35% from 2Q07, and high yield and leveraged loan volume decreased 46% and 37% respectively. Many high grade companies sought to shift their borrowing from

choppy short term financing to longer term bonds and notes locking lower rates as the yield curve inverted and short term markets became dislocated. The high yield and leveraged loan markets are in the midst of a major correction. Fixed income debt underwriting revenues were down 35% to \$350 million in 3Q07 vs. \$540 million in 2Q07 as the lower leveraged finance and investment grade revenues overpowered higher revenues from structured client solutions transactions, particularly in Europe.

### Investment Management

Investment Management reported record revenues of \$ 802 million in 3Q07 vs. \$768 million in 2Q07. The performance was driven by record revenues from increased levels of AUM and a \$35 billion increase in alternative investment management fees that included \$21 million of fees coming from Merchant Banking and \$7 million from third party private equity management fees.

Assets under management grew to a record \$275 billion from \$263 billion in the prior quarter.

### Mergers, Acquisitions, and Private Equity Investments

Lehman continues to be very active pursuing acquisitions and private equity investments.

- Regarding Lehman's minority investment in GLG, the GLG share price is still trading near the acquisition price and Lehman still expects to recognize a 4Q07 gain estimated near \$390 million from their investment in GLG Partners which the firm expects to be liquidated when GLG accesses the public markets through a reverse acquisition with Freedom Acquisition Holdings, Inc. GLG is one of the world's most successful multi-strategy asset managers with an experienced team of highly-regarded investment professionals and a history of strong and sustained investment performance.
- Closed deals in the 3Q07 included the June 2007 acquisition of 100% interest in Eagle Energy which is a natural gas and power marketer located in Houston, Texas for \$335 million in cash plus employee retention incentives of up to \$40 million. Eagle is expected to be the Lehman energy platform going forward.
- LightPoint Capital was 100% acquired in July 2007. LightPoint is a leveraged loan investment manager with approximately \$3 billion AUM. The cost was \$36 million in cash with estimated earnouts of \$40million
- Brics International is an institutional equities business in Mumbai, India which was purchased in August 2007 for \$2 million in cash up front and scheduled subsequent payments of \$49 million through August 2009. There are \$17 million for employee retention incentives.
- SkyPower is an early stage wind and solar power generation development company located in Toronto in which Lehman purchased temporary control paying \$114 million for a 56.5 % interest. Lehman expects to deconsolidate this investment in early 2008 it is transferred into a fund or through further funding which will dilute the Lehman interest to less than 50%.

## **Special Topics**

### **RISK APPETITE**

There was a presentation on Risk Appetite where in the Firmwide Risk Appetite Limit for 2007 was revised and increased from \$3.3 billion to \$3.5 billion. The increase was driven by two factors:

- The YTD performance of the firm which has generated enough earnings that, even in an extremely stressed scenario, Lehman can increase its risk appetite and still meet its minimum return requirements.
- The increased earnings capacity of the firm

It should also be noted that in the stressed environment of the past several months, Lehman has been over the Risk Appetite limit numerous times, and this increase will allow the firm to continue to take high levels of risk without exceeding the limit as frequently. Otherwise, there is pressure to take less risk and not exceed the limit.

## **LEHMAN BROTHERS**

### **FINANCIAL REVIEW – YEAR ENDED ENDED NOVEMBER 30, 2006**

#### **NOTES OF THE MEETING OF JANUARY 17, 2007**

##### **Liquidity and Funding**

The liquidity pool at the holding company totaled \$31.4 billion at the year ended 11/30/06 compared to \$28.5 billion at the quarter ended 8/31/06. The \$2.9 billion increase was primarily due to the addition of Aegis investments as part of reportable liquidity. The addition of Aegis investments amounted to \$2.3 billion. Other large components of the \$31.4 billion year end liquidity pool included Treasuries and other government bonds of \$8.5 billion, Agency MBS of \$9.9 billion, Agencies securities of \$5.2 billion, and cash of \$3.2 billion. All liquidity pool holdings are tri-party eligible. The Aegis Investments are held in a SPV. Because of this and other considerations as to the nature of these investments, whether or not they are highly liquid and readily available to meet holding company requirements, the appropriateness of inclusion in the liquidity pool is being discussed with the Co-Treasurer. The details of the Aegis investments have also been requested. After the meeting in February, the matter was discussed further with the Co-Treasurer and he agreed that in the future the Aegis Investments will not be included in the holding company liquidity pool. Factors such as the investments being available only for SPV purposes and not available for meeting all obligations of the holding company were among the considerations.

Lehman had \$78.5 billion of long term debt outstanding at 11/30/06, up \$7.1 billion from the \$71.4 billion outstanding at the end of the prior quarter. The firm issued \$8.9 billion of unsecured long term debt in the fourth quarter bringing the total issuances for fiscal 2006 to \$39.3 billion, which was up from the \$22.6 billion of long term debt issued during 2005. The growth in long term debt was required to fund a substantial part of the growth in Lehman's balance sheet during 2006.

The ratio of long term debt to the net balance sheet was 29% at 11/30/06, down slightly from the 30% ratio target, which was the ratio at the end of the prior quarter. The slight decrease ratio reflects continued balance sheet growth in the fourth quarter as net assets increased to \$268.9 billion from \$239.4 billion at the end of the third quarter.

Net leverage for 2007 is targeted at 14.5x, up from the 13.5x target of prior years. The Treasurer explained that the leverage has been increased because the firm expects a significant part of the growth in assets to be in relatively low risk, liquid assets.

The net balance sheet target for 2007 includes an expectation that the firm's balance sheet will grow 21% with 70% of the growth coming from Fixed Income Core businesses and Capital Markets Prime Services (hedge fund driven). During 2006 the net balance sheet grew by 27% with Fixed Income Core and Capital Markets Prime Services accounting for 85% of the growth.

The growth in long term debt has matched the growth in the balance sheet.

The firm continued to actively issuance debt as the market remained very favorable. The strong investor interest in Lehman and the brokerage firms was attributed to the continued strong growth in reported revenues and earnings and investors searching for increased yield as spreads have continued to tighten.

Lehman debt spreads traded tighter throughout the quarter as a positive tone was prevalent in the brokerage sector. Five year spreads tightened by 3-4 bps while 10 year spreads improved by 5-6 bps. The major brokerage firms continued to report strong earnings growth. Another impetus for the brokerage sector was the S&P announcement that they were upgrading MER and GS to AA-, BCS to A+, MS to positive outlook and affirming LEH.

The firm issued subordinated debt for the first time on 9/14/06 with a 750 million Euros, 10 year non callable lower tier 2 issue, and then followed that with a \$1.25 billion of 10 year fixed rate sub debt issue in the U.S. market on 10/17/06. Going forward, the Lehman sub debt plan calls for the issuance of \$1 billion of sub debt per quarter in order to raise the \$8 billion of sub debt to meet CSE capital requirements by 12/1/08.

### **Cash Capital**

The cash capital surplus was \$6.0 billion at 11/30/06, up \$1.3 billion from \$4.7 billion at the 8/31/06 as long term debt issuance outstripped the growth in requirements for the quarter and was the primary contributor to the increase in the cash capital surplus. The \$6.0 billion surplus was relatively high and well above the firm's targeted surplus of \$4 billion.

Cash capital usage increased to \$94.7 billion at 11/30/06, up \$5.4 billion from \$89.3 billion the prior quarter. The increase in usage was driven mainly by a \$5.6 billion increase for less liquid assets to \$48.0 billion. Cash capital requirements for commercial and residential whole loans was up \$9.4 billion to \$33.9 billion at 11/30/06 from \$24.5 billion at the prior quarter ended 8/31/06.

### **Balance Sheet**

Total assets were \$504 billion at 11/30/06, up \$30 billion from the \$474 billion at 8/31/06. Financial Instruments and long inventory positions increased \$22 billion led by increases of \$10 billion in government securities that included a \$4.6 billion increase in US Agencies and a \$4.2 billion increase in municipal bonds. Corporate debt positions increased \$10.7 billion, dominated by non – US loans and securities. Equities were up \$6.6 billion. Mortgages decreased by \$4.5 billion during the quarter.

On the liabilities side, short inventory positions were up \$5.1 billion led by a \$2.2 billion increase in Equities mainly related to hedge fund activity. Short positions in

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corporate debt also increased \$2.0 billion primarily related to Europe IRP and CDOs. Customer payables also jumped \$5.8 billion to \$41.2 billion as prime broker shorts increased \$5.3 billion.

Stockholders' equity increased \$795 million during the quarter to \$19.2 billion at 11/31/06.

Total long term capital increased \$7.9 billion to \$100.4 billion at year end from 92.5 billion the prior quarter reflecting the increase in equity and long term debt issuance.

### **Fair Value Accounting Pursuant to FAS No. 157 Adoption Impact**

Lehman adopted FAS 157 Fair Value Accounting as of the beginning of the new fiscal year, December 1, 2006. The impact of the adoption of this pronouncement was reviewed. The retained earnings adoption impact was an after tax credit of \$64 million of which \$43 million related to EITF 02-03 reserve releases. Other effects were even less material.

### **Operating Performance Review**

#### **Total Firm**

For the fourth quarter ended 11/30/06, the Lehman Brothers Holdings, Inc. net income was \$1.0 billion, up from net income of \$916 million in the third quarter of fiscal 2006. The fourth quarter was the best revenue quarter ever for Lehman as net revenues were \$4.5 billion, up from \$4.2 billion in the third quarter of 2006, and an increase of 23% from the \$3.7 billion of revenues in the fourth quarter of 2005. The fourth quarter of 2006 was the best revenue quarter ever for the firm as business momentum picked up especially during November. Non-interest expenses for the fourth quarter were \$3 billion compared to \$2.8 billion in the third quarter of this year and \$2.5 billion in the fourth quarter of 2005. The compensation ratio was 49.3% for the fourth quarter of 2006 compared to 49.3% for the third quarter of 2006 and 48.7% for the fourth quarter of 2005.

For the fourth quarter of 2006, Investment Banking revenues of \$858 million were a record, driven by strong performances in debt and equity origination and solid merger and acquisition activity. Capital markets revenues of \$3.0 billion in the fourth quarter of 2006 were up 28% from the prior year, driven by both Fixed Income and Equity Capital Markets. Fixed Income Capital markets revenues were up 31% over the prior year, reporting its second highest revenue quarter ever reflecting strong levels of client activity and improved results in credit products. Equity Capital Markets also reported its second highest revenues quarter ever, up 22% over the prior year, driven by solid customer flow activities, improved market conditions, and continued growth in the prime brokerage businesses. Investment Management reported its highest quarter ever as revenues increased 26% over that of the prior year to \$640 million.



For the full 2006 fiscal year, net income was \$4.0 billion, up 23% from the net income of \$3.3 billion for the 2005 fiscal year. EPS for the 2006 fiscal year was \$6.81, up 25% from the EPS of \$5.43 for the 2005 fiscal year.

For the full 2006 fiscal year, net revenues were \$17.6 billion, up 20% over the \$14.6 billion for fiscal 2005. Lehman Brothers reported record revenues for 2006 in each business segment and in each region. Non-U.S. revenues grew 21% to a record \$6.5 billion, representing 37% of firmwide revenues. The compensation ratio was 49.3% for the full fiscal year 2006 which was flat with the 49.3% reported in the prior fiscal year 2005. The firm's headcount was approximately 26,000 which was up 5% Q/Q and 13% Y/Y.

Return on equity (ROE) was 27.6% for the fourth quarter of 2006 versus 26.5% for the fourth quarter of 2005. For the full 2006 fiscal year, ROE was 29.1% compared with 27.8% for fiscal 2005.

<u>Financial Information</u>	<u>4Q06</u>	<u>3Q06</u>	<u>2006</u>	<u>2005</u>
Total Net Revenues (\$ in mil)	4,178	4,178	13,050	11,576
Net Income (\$ in mil)	1,004	916	3,003	2,369
ROE (%)	27.6	21.0	29.1	27.8
Comp Ratio (%)	49.3	49.3	49.3	49.3
Total Assets (\$ in mil)	503,700	473,737	503,700	410,063
Long-term debt	81,378	74,034		
Total Stockholders' Equity	18,096	17,301	18,096	15,699
Total Capital	99,802	92,430	99,802	70,693
Gross Leverage Ratio	26.2x	25.8x	26.2x	24.4x
Net Leverage Ratio	14.5x	13.5x	14.5x	13.6x

## **Business Overview**

Lehman Brothers reports operating results in three business segments: (1) Investment Banking, (2) Capital Markets, and (3) Investment Management.

### **Investment Banking**

Investment Banking revenues for the fourth quarter of 2006 were a record \$858 million, driven by strong performances in debt and equity origination and solid merger and acquisition activity. Equity origination revenues were strong as lead managed volume was up significantly, especially for IPOs and convertibles. M&A revenues continued to be up and the pipeline for both equities and debt continued to be strong. Debt origination revenues were up significantly, particularly investment grade debt originations. Non investment grade volume was also up particularly in the high yield business as volume was driven by sponsor related and M&A related deals. Customers were interested in

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getting deals done before the end of the year as the strong third quarter pipeline was worked down a bit. Residential mortgage origination volume was flat. The hybrid market was revived reflecting the capital treatment clarity provided by NAIC (National Association of Insurance Commissioners) in September. Lehman is a leader in the hybrid market and revenues were up.

### Capital Markets

Capital markets revenues for the fourth quarter increased 28% over the prior year fourth quarter to \$3.0 billion on strong performances by both Fixed Income and Equity Capital Markets. Fixed Income Capital Markets revenues of \$2.1 billion were up 31% for the quarter over the prior year, reporting the second highest revenue quarter ever. Customer activity, which was at the highest levels for the year, and improved results in credit products were significant contributors to the increased revenues as investors continued to search for incremental yield. The high yield business posted record revenues due to stronger customer activity, improved market conditions, stable credit quality, and improvements in sectors such as airlines and autos. The increased revenues reflected the depth and breadth of the firm's global, diversified set of businesses as strong results in certain asset classes and regions helped offset softness in others. The performance of several fixed income businesses backed off in the fourth quarter compared to prior periods. Commercial real estate revenues were down as were FX revenues as market volatility was near record lows.

Equity Capital Markets also reported its second highest revenue quarter ever, up 22% over the prior year, driven by solid customer flow activities, improved market conditions, and continued growth in the prime brokerage businesses. The firm had record revenues in convertibles and equities trading as the execution services business is benefiting from the firm's investment in electronic trading systems. Convertibles reported record revenues as clients were more active as a result of higher market valuations of both equities and bonds. The strong origination calendar for convertibles during the quarter bolstered the secondary market in convertibles. The growth in prime brokerage revenues continued across the board and across regions, driven both by adding clients and by increases in existing client balances and activity levels in various products. Revenues were strong from the merger arb business and the in statistical arbitrage space. The firm experienced higher levels of growth outside of the U.S. Additionally, private equity reported a \$70 million profit for the fourth quarter. Lehman disclosed that about \$2 billion was invested in private equity and merchant banking type activities.

### Investment Management

Investment management reported the highest revenues ever for the fourth quarter with net revenues of \$640 million increasing 26% over the \$509 million in the fourth quarter of 2005. This performance was driven by record revenues in both Private Investment Management and Asset Management.

Assets under management grew to a record \$225 billion, up from the \$207 billion at the

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end of the third quarter.

## **TRENDS**

### Overall

- Earnings continued to be strong for both the fourth quarter and the full year at \$1.0 billion and \$4.0 billion, respectively.
- ROE strong at 22.3% for the fourth quarter and 23.4% for the year.
- Revenues of \$17.6 billion for the year was another record year, up 20% over the prior year's revenues, while the fourth quarter revenues of \$4.5 billion were up 8% over the prior quarter and 23% over those of the fourth quarter of the prior year.
- Mortgage business trend continues to be softer
- Investment banking continues at or near record levels

### Investment Banking

- Overall, origination fell as credit spreads widened
- Equity IPOs decreased as deals were put on hold or pulled.
- An increase in fixed income origination. Debt underwriting was up 20% over the second quarter driven primarily by high yield and leveraged loan transactions dominated by sponsor activity.
- August was a surprisingly favorable environment as many financial institutions issued debt.
- Advisory services fees were down.

### Capital markets

- Overall, revenues down slightly
- Commercial and residential real estate revenues from securitization activity remain strong, although U.S. residential business softened.
- CMBS has been strong all year
- Structured derivatives were strong in both fixed income and equities
- Challenging period for equities as valuations were flat
- Cash equities business was strong reflecting strong customer flow business, especially in Europe (surprising since it was summer) and NASDAQ.
- Prime Brokerage had record revenues.

### Investment Management

- Steady growth in revenues and AUM continued

## **LEHMAN BROTHERS**

### **FINANCIAL REVIEW – QUARTER ENDED AUGUST 31, 2005**

#### **Notes of Meeting of October 21, 2005**

##### **Liquidity and Funding**

- Liquidity Pool – Lehman’s holding company liquidity pool totaled \$19.1 billion at 8/31/05 including \$1.5 billion of the undrawn portion of the LBHI committed credit facility. Excluding the undrawn portion of the committed credit facility, the liquidity pool totaled \$17.6 billion composed of cash of \$2.1 billion and liquid, investment grade instruments of \$15.5 billion. At the prior quarter ended 5/31/05, the liquidity pool amounted to \$16.6 billion including the undrawn committed credit facility of \$1.5 billion and \$15.1 billion excluding the undrawn committed credit facility. The increase in the size of the liquidity pool reflected the increase in cash capital surpluses. At 3Q05, the liquidity surplus one year forward amounted to \$3.8 billion.
- S&P raises credit rating – In early October 2005, S&P raised its long-term counterparty credit rating of Lehman brothers Holdings, Inc. one notch to A+, its fifth highest investment grade ranking. This brings Lehman’s credit rating up to the level of Merrill, Goldman and Morgan. S&P cited greater diversification in Lehman’s earnings and investment banking market share. S&P also noted Lehman’s “top-notch market risk management expertise, high profitability the past several years, and strong liquidity”. Treasury and management have worked for a long time to get S&P to raise this credit rating. LBI is rated AA by both S&P and Moodys.
- The leverage ratio per Lehman was 13.2 compared to 13.8 the prior quarter. The leverage ratio expectations were discussed with respect to the new S&P rating. Paulo indicated that he thought the firm leverage would be acceptable in the 13-14 range.
- Debt issuance - The yield curve continued to flatten during the quarter as short term rates continued to increase. Lehman debt spreads continued to be tight. During 3Q05 long-term debt issuance amounted to \$6.1 billion compared to \$5.0 billion in 2Q05. Approximately 50% came from structured debt including \$838 million from a European structured 2 year deal at a 2.19% rate. Other larger issuances included a \$1 billion, 4.50%, five year fixed rate syndicated issuance done in the U.S. at an all-time tight spread of LIBOR + 24 bps. Two additional issuances of 7 year MTN floating rate notes totaling approximately \$952 million at 30.5 bps and 33 bps were done with bond funds and Insurance companies being the big buyers. E-CAPS (Enhanced Capital Advantaged Preferred Securities) amounting to \$300 million were done. The E-CAPS are an innovative form of hybrid equity having a very long term and high equity content, which is treated as

perpetual preferred by the rating agencies, and yet treated as debt for accounting and tax purposes.

In mid-October, two sizable issuances were done. One was a \$370 million five year Samurai transaction at a rate of LIBOR+22 bps – a new all-time tight spread for a five year issuance per Lehman, and a \$500 million three year floating rate note at LIBOR + 9 bps – per Lehman their tightest level ever for a three year issuance.

There was no material change in the short-term debt issuance or secured funding.

The Lehman Brothers Commercial Bank, the Utah based ILC), is in place is currently funding over \$2 billion of assets. The establishment of this bank provides additional liquidity through diversification of liquidity sources. The bank relies on the FDIC insurance protected market.

- Less liquid assets – There were no significant changes in less liquid assets at the end of the quarter compared to the prior quarters. Commercial whole loans and mortgages continued to be the largest less liquid trading asset class as they continued to amount to about \$17 billion despite considerable activity in this asset class during the quarter from both syndications and sales. Illiquid non trading assets also changed little, amounting to \$13.7 billion at the end of the quarter. The non trading illiquid assets are composed primarily of fixed assets, goodwill, operational cash at banks, and deferred taxes.
- Capital – Total capital is up about \$3.6 billion from the prior quarter as the equity increase was driven by earnings and hybrid equity while long term debt increased \$3.1 billion overall.
- Cash Capital – The cash capital surplus at the end of the third quarter was \$5.7 billion, well in excess of the \$2 billion target, and greater than the \$3.8 billion at the end of the May 2005 quarter. However, at the end of September, the surplus was \$1.4 billion, below the \$2 billion target. Heidi explained that this was a temporary situation where a large deal involving a commercial real estate syndication that was pre-funded out of Treasury prior to the end of September and the syndication did not occur until early October. Generally, Treasury prefers not to pre-fund transactions but this one was done with Finance Committee approval. By mid-October the surplus was back up in the \$2.5 billion range.

While there were no cash capital policy changes, there were two changes in reporting methodology. First, \$2 billion of matched assets and liabilities that were previously netted down are now being shown gross as a source and use of cash capital – there was no effect on net cash capital but the change gives Treasury better visibility. Second, the liquidity requirement due to contingent collateral as a result of a Lehman Brothers one notch downgrade is now being recognized separately in the amount of \$1 billion. Again the net effect is nil since previously the liquidity requirement for the one notch downgrade was taken into consideration of a capital requirement as part of the \$3 billion cash capital surplus requirement instead of being shown separately. Additional discussion related to

the probability that this requirement may be reduced as a result of the S&P ratings improvement.

- Refco and the surrounding events had no material effect on the firm's liquidity.
- Matters for follow-up at the next quarterly financial review meeting – Matt requested a presentation of a new funding vehicle that Lehman has been working on, the Brahms II financing structure, at the next meeting. Heidi said it would be done.

## **Operating Performance Review**

### **Total Firm**

Lehman Brothers' net income of \$879 million for the third quarter ended August 31, 2005 represented a 74% increase over the third quarter of 2004. Net income was \$2.4 billion for the nine months ended August 31, 2005, up 37% compared to the first nine months of 2004. For the quarter Lehman had record net revenue, net income and EPS with part of the incremental change driven by record Investment Banking and Investment performance and the second highest Capital Market performance – second only to the first quarter of 2005.

<u>Financial Information</u>	<u>3Q05</u>	<u>2Q05</u>	<u>2005YTD</u>	<u>2004YTD</u>
Total Net Revenues(\$ in mil)	3,852	3,278	11,388	11,388
Net Income (\$ in mil)	879	683	2,330	2,330
ROE (%)	23.0	18.2	15.7	15.7
Comp Ratio (%)	49.5	49.5		
Total Assets (\$ in mil)	381,000	370,595		
Long-term debt	63,073	59,809		
Total Stockholders' Equity	16,334	15,878		
Total Capital	79,407	75,687		

### **Business Overview**

Lehman Brothers reports operating results in three business segments: (1) Investment Banking, (2) Capital Markets, and (3) Investment Management.

#### **Investment Banking**

- Global Finance – Debt had revenues of \$336 million – Debt investment banking was up 8% over the prior quarter and 39% over the comparable quarter in 2004. Commercial mortgage real estate syndications and sales were very strong as well as residential mortgages. Asset backed products were in strong demand throughout the quarter while the hi yield business slowed a bit from the prior

quarter, particularly at the lower end of the credit spectrum. There has also been a strong demand for commercial real estate properties generating revenues from syndications and sales, including significant real estate property sales to Lehman sponsored commercial real estate funds.

- Equity had revenues of \$255 million were very strong, nearly double those of the third quarter of 2004. The IPO and convertible businesses were very strong. Lehman was the lead underwriter for the three largest equity underwritings during the quarter while the converts market bounced back after nearly a year of difficult times as it appeared that the redemptions in the convertible funds had leveled off and fund managers were able to again trade and implement investment strategies in response to some of the opportunities in this market per Lehman.
- Advisory Services had revenues of \$224 million – Advisory services was also strong as a lot of deals are getting done and the pipeline is strong per Lehman.

#### Capital Markets

- Capital markets revenues were up 49% for the quarter over the 3<sup>rd</sup> quarter of the prior year
- Fixed Income had revenues of \$1.89 billion – Significant revenue increases came from the commercial mortgage and commercial real businesses mostly in the U.S. Residential mortgages remained a strong revenue generator during the quarter while there was improved performance over the second quarter in credit products and interest rate products.
- Equities had revenues of \$637 million – revenues up as trading volume was up reflecting the increased in equities and the turnaround in converts during the quarter after a stressed second quarter caused by the credit downgrades in the auto industry and the threat of significant hedge fund redemptions. The third quarter was the strongest for equities revenues since the first quarter of 2001. August was an active month in the markets as trading volume did not experience the normal seasonal decline this year.

#### Investment Management

- Asset Management had revenues of \$272 million vs \$204 million in 3Q04
- Private Investment Management had revenues of \$239 million vs \$193 million in 3Q04.
- Assets under management continued to increase driven by both an increase in inflows and in valuation.
- The Neuberger Berman acquisition has been a significant contributor to the performance of investment management

### **Balance Sheet Review**

- Balance sheet composition and fluctuations – Total assets at 8/31/05 were \$384 billion vs \$371 billion at 5/31/05 as the firm managed the balance sheet down to its balance sheet and leverage targets at the quarter end. Nearly all of the increase was a reverse repo, \$15.6 billion, as Treasury used its cash in a reverse repo instead of the business working with a third party. Long inventory increased \$2.4 billion while stock borrowed decreased \$3.9 billion. Short inventory went up \$3.4 billion driven primarily by increases in U.S. Governments and agencies

### **ILC – New Utah Bank**

Lehman's use of the ILC continues to move forward. Currently it has about \$2 billion in assets with the current plan to grow it to \$10 billion. The bank will be used to fund the corporate loan business as well as high yield and some investment grade business.



## LEHMAN BROTHERS

### FINANCIAL REVIEW – YEAR ENDED NOVEMBER 30, 2005

#### Notes of Meeting of January 10, 2006

#### Liquidity and Funding

- **Liquidity Pool** - At the year ended November 30, 2005, the holding company liquidity pool totaled \$18.3 billion compared to \$17.6 billion at the prior quarter ended August 31, 2005. The year end liquidity pool was composed of investment grade securities of \$16.3 billion and cash of \$1.9 billion. The investment grade securities included Treasuries, G7 Government and agency bonds amounting to \$12 billion, FHLB eligible residential mortgages of \$2.0 billion, and corporate equities of \$2.0 billion, including \$1.8 billion of liquid, preferred shares of two highly rated banks. At the end of the prior quarter \$2.3 billion of the banks preferred shares were included in the liquidity pool. The Lehman liquidity pool no longer includes the undrawn portion of the holding company committed credit facility because the firm changed the relevant liquidity policy. This is discussed in more detail below.
- **Capital** – Total capital was \$79.1 billion at the year ended November 30, 2005 compared to \$79.3 billion and \$71.4 billion at end of the prior quarter and prior year end respectively. Total capital was composed of \$62.3 billion of long term debt and \$16.8 billion of stockholders' equity representing only small changes in each from the prior quarter end. Stockholders' equity changes primarily reflected the firm's net income of \$823 million for the quarter and offsetting stock buybacks of \$905 million.
- **2006 Funding Plan** – The 2006 Lehman funding plan was reviewed. Funding Lehman's business is currently relatively easy and inexpensive as balance sheet growth is being restricted, there is significant global demand for the firm's debt, and earnings growth continues to be strong. Lehman expects a \$10 billion increase in the holding company Cash Capital Requirements in 2006 to \$75.2 billion from the 2005 level of \$64.9 billion as the firm continues to grow its balance sheet. Major components of balance sheet growth are a \$39 billion increase in fixed income products and a \$6 billion in Equities. The firm expects that cash capital intensity will be somewhat reduced as Lehman Brothers Commercial Bank, the ILC, becomes self-funded and is able to take more 100% cash capital assets such as commercial whole loans and mortgages. Secured financing is expected to become more efficient providing additional funding. In order to ensure compliance with the funding framework, an average \$4 billion cash capital surplus has been budgeted, representing \$2 billion coverage of the minimum required funding and a \$2 billion additional volatility cushion. In 2006, the firm plans to issue \$17 billion of long term debt with an average maturity of

seven years. Given the favorable market conditions for Lehman's debt issuance, the relatively low interest rates and tight spreads, and continuous investor demand for the firm's debt and structured notes, the firm considers the environment for debt issuance to be very favorable. Of the \$17 billion of debt expected to be issued, it is anticipated that structured notes and debt issuances would each provide half of the funding.

- **Debt issuance** – Total debt issuance in the fourth quarter was \$5.4 billion, of which \$2.9 billion was structured debt. Structured debt continues to provide roughly half of the firm's long term debt funding requirements at favorable terms. Much of the structured debt is issued to bond funds and pension funds. For the year total long term debt issuances were \$22.6 billion compared to \$20.1 billion in the fiscal year ended November 30, 2004. Long term debt issuances continued to significantly exceed maturities as the long term debt outstanding at the year ended November 30, 2006 amounted to \$60.3 billion compared to \$55.5 billion the prior year. Continued tight spreads allowed the firm to continue to grow the amount of long term debt at very efficient cost of funding levels.
- **Cash Capital** - Lehman reported a cash capital surplus of \$6.9 billion at November 30, 2005 compared to \$6.1 billion at the end of the last quarter. Both amounts are significantly above the \$2 billion targeted surplus. Cash capital usage increased \$1.1 billion to \$64.9 billion. Most of the increase related to increased illiquid assets, especially in commercial mortgage loans. The liquidity surplus one year forward (MCO) was \$2.7 billion greater than cash requirements.
- **Less Liquid Assets** – The amount of illiquid assets was up \$1.1 billion to \$26.9 billion, primarily related to the normal build up of commercial mortgage loan and corporate loans portfolios awaiting syndication which increased to \$16.5 billion at November 30, 2005.
- **Stock Repurchase Program** – Stock buybacks amounted to \$905 million during fiscal year 2005, about \$66 million higher than budget.
- **Liquidity Policy Changes**
  - The firm changed its definition of the liquidity pool composition such that the undrawn portion of the holding company committed credit facility is no longer included in the Lehman liquidity pool. Lehman's liquidity pool composition consists of cash and investment grade securities, which agrees with the way the SEC views the liquidity pool composition. This was a matter of discussion during the CSE application review for Lehman, who included the undrawn portion of the holding company committed credit facility in the liquidity pool whereas the SEC is of the opinion that the holding company facility lacks sufficient liquidity to be included. However, the SEC does recognize that the undrawn portion of committed facilities is a part of the liquidity risk management process. The Lehman policy change aligns their internal definition of the liquidity pool with that of the SEC.

- Lehman also changed its Funding Action Plan to include specific language relating to communications with regulators including the SEC.
- **Breaches of Policy** - At the end of September 2005, there were breaches of the firm's policies relating to the both Cash Capital and MCO (cash position one year forward). Both amounts were below the required amounts by several billion dollars. The breach was anticipated, discussed and approved by the management finance committee in advance of the breach. Since the transactions to raise the funding to cover the cash requirements was in place but not completed, Treasury management and the finance committee did not chose to incur the cost to raise temporary funding to maintain policy compliance. The breaches occurred because the firm had a temporary situation where cash requirements caused cash capital and MCO to temporarily dip below the guidelines. There did not appear to be any significant effect on the firm's liquidity. The breach lasted approximately two weeks during which funding was raised in excess of the amount required to bring the firm back into compliance. The firm was back in compliance on 10/14/05. There were no subsequent breaches reported.
- **Credit Rating** – As previously reported, in early October 2005, S&P raised its long-term counterparty credit rating of Lehman Brothers Holdings, Inc. one notch to A+, its fifth highest investment grade ranking. This brings Lehman's credit rating up to the level of Merrill, Goldman and Morgan. S&P cited greater diversification in Lehman's earnings and investment banking market share. S&P also noted Lehman's "top-notch market risk management expertise, high profitability the past several years, and strong liquidity".

### **Balance Sheet**

- Total assets at 11/30/05 were \$410 billion compared to \$384 billion at the prior quarter end 8/31/05, an increase of \$26 billion.
- Securities and other inventory positions increased \$11 billion with the increases coming primarily in government and corporate bonds.
- Assets related to the secured financing/repo business increased \$8 billion.
- Liabilities related to securities and other inventory positions sold but not yet purchased increased \$13 billion.
- The increases in assets related to the secured financing/repo business were financed to a large extent by a \$9 billion increase in liabilities.
- Long term debt and equity did not change significantly.

### **Operating Performance Review**

#### **Total Firm**

Lehman Brothers' again reported record net income, EPS, and revenues for the

fiscal year ended 11/30/05. Net income for the 2005 full year increased to \$3.3 billion, an increase of 38% over the \$2.4 billion for 2004. EPS was \$10.87 for the fiscal year 2005 compared to \$7.90. Net revenues for the fiscal year were \$14.6 billion, up 26% from the \$11.6 billion for fiscal 2004. Chairman Richard Fuld said that the record performances across all segments and regions continue to demonstrate the diversity, depth and scale of the firm's global franchise. Lehman achieved record net revenues in every segment and in every region for the year.

Fourth quarter results were also good although slightly off the record pace of the third quarter. Net revenues were \$3.7 billion, 4% less than the prior quarter but up 28% over the prior year fourth quarter. Net income for the quarter was \$823 million, down from the \$879 million for the record third quarter ended. Fourth quarter results were led by record investment banking revenues of \$817 million, up 34% over the prior year; record merger and acquisition advisory revenue, up 54%, and solid performances in equity and debt origination. Capital markets revenues were up 30% for the quarter over the prior year driven by increased customer flow activity across most equity products with both Asia and Europe experiencing significant growth. The performance of the business segments is discussed below in more detail.

<u>Financial Information</u>	<u>4Q05</u>	<u>3Q05</u>	<u>2005</u>	<u>2004</u>
Total Net Revenues (\$ in mil)	3,690	3,852	14,630	11,576
Net Income (\$ in mil)	823	879	3,260	2,369
ROE (%)	20.9	23.0	21.6	17.9
Comp Ratio (%)	48.7	49.5	49.3	49.5
Total Assets (\$ in mil)	410,000	384,295		357,168
Long-term debt	62,672	62,920		56,486
Total Stockholders' Equity	16,794	16,334		14,920
Total Capital	79,466	79,254		71,406
Gross Leverage Ratio	24.4x	23.5x		23.9x
Net Leverage Ratio	13.6x	13.1x		13.9x

## **Business Overview**

Lehman Brothers reports operating results in three business segments: (1) Investment Banking, (2) Capital Markets, and (3) Investment Management.

### **Investment Banking**

- Fourth quarter results were led by record investment banking revenues of \$817 million, up 34% over the prior year driven by the second highest ever debt underwriting revenues, solid equity underwriting revenues, and record merger and acquisition advisory revenues which increased 54% over the fourth quarter of 2004.

- For the full year, investment banking revenues were up 32% over 2004 as debt underwriting was up 30%, equity underwriting was up 47%, and merger and acquisition advisory revenues were up 22%.
- The leveraged finance business was particularly strong with the record quarter showing a 23% increase over the fourth quarter of 2004 and more than triple the third quarter of 2005. Lehman had numerous key transactions as the Lehman market share increased while overall market volumes decreased.
- Equity origination revenues were up 48% over the fourth quarter of 2004 though down 18% from the strong results in the third quarter of 2005, which were driven by several large transactions including Hudson City (\$60-\$70 million in revenues), McDonald's Japan, and Pilgrim's Pride block, and Montpelier Re block (\$20 million in revenues). Equity origination was strong in Europe in the fourth quarter of 2005.
- Debt revenues were flat compared to the prior quarter although up 30% in 2005 compared to the prior year. There was less activity in the fourth quarter as spreads widened on higher expected inflation, fluctuating oil prices, mixed economic data and mixed corporate earnings. Lehman did have a number of large transactions although corporate derivatives activity slowed in the fourth quarter.
- Pre-tax margins were down for investment banking in the fourth quarter as bonuses were higher than those provided in order to keep people.

### Capital Markets

- Lehman is putting a significant effort into building a capital markets business in Japan including building an investment banking franchise focused on origination, building out the cash trading business, and hiring investment bankers. Lehman has not had a significant franchise in Japan heretofore.
- The first quarter of the new fiscal year 2006 is off to a strong start with January being very strong. Equities have been particularly strong and debt capital markets have also been strong as rates are still relatively low and transactions are getting done. The high yield market is bifurcated as bonds have dropped off while loans have stayed hot as rates went up. The first quarter could perhaps be a record quarter per Gerry Reilly.
- Capital markets revenues increased 30% for the quarter over the prior year to \$2.4 billion driven by strong performance in both fixed income and equity markets. Customer flow activity across most equity products with in Asia and Europe experienced significant growth. Fixed income revenues were up 22% equities revenues were up 49% over the fourth quarter of 2004.
- Revenues for the fourth quarter of 2005 were down 6% from those in the strong third quarter, which was typical of the industry as capital markets revenues were down sequentially at all competitors except Bear Stearns.
- Equities had their highest quarterly revenues since 1Q2000 driven by increased client activity in both cash and derivatives businesses as well as favorable secondary trading in Asia. The strongest performance came as volatility gains were up 300% over the fourth quarter of 2004 and 64% over the third quarter of

2005

- Equities finance, which includes prime brokerage, was up 31% over the fourth quarter of 2004 although down 11% sequentially. The decline was due to the seasonality of the yield enhancement business in Europe.
- In fixed income, the mortgage business was down 18% sequentially as revenues decreased because of spread widening on subordinated tranches, which has since stopped.
- Real estate revenues were up 23% over the prior year but down 33% sequentially as the third quarter of 2005 included a number of large one time gains related to the sale of real estate assets.

### Investment Management

The investment management business continues the upward trending performance driven by the private management business and record assets under management.

### **Other Matters – Repatriated Earnings**

Ed Grieb stated that Lehman did not repatriate earnings primarily because there was not much in excess earnings to be repatriated. Lehman has been repatriating earnings on a regular basis during the past several years. The firm is planning expansion overseas and wanted to keep the earnings and capital in place.

## **Firmwide Results**

### Overview

Martin Kelly was out sick, thus Robert Zerod and Ryan Treversari provided the firmwide results. Since the revenue numbers are discussed in detail during each monthly meeting, they provided a high-level overview of the numbers and a discussion of the mark to market adjustments.

Revenues for 1Q08 were \$3.5bn, which included a net mark to market adjustment of -\$1.8bn. Net income was \$489m, with a pre-tax margin of 18.9% versus 28.0% in 4Q07. Non-US revenues were 62% of the total firm revenues, versus 62% in 4Q07 and 40% in 1Q07. While the firm has been pushing to increase non-US revenues, the fact that the writedowns were almost exclusively US-based drove this number.

Gross and net mark to market adjustments for the quarter include:

\$bn	Gross	Net
Residential mortgage-related positions	(\$3.0)	(\$0.8)
Other asset-backed positions (includes Auction Rate Securities)	(0.2)	(0.1)
Commercial mortgage-related positions	(1.1)	(0.7)
Real estate-related investments	(0.3)	(0.3)
Acquisition finance facilities (funded and unfunded)	(0.7)	(0.5)
Valuation of debt liabilities	0.6	0.6
Total	(\$4.7)	(\$1.8)

### Balance Sheet Analysis

The balance sheet grew by 14% over the quarter, from \$691bn as of 11/30/07 to \$785.6bn as of 2/29/08. The largest increase was in collateralized lending and borrowing, where reverse repo and secured borrowing increased by \$47.5bn and \$19.9bn respectively. Combined repo and secured lending increased by \$17.8bn. These increases were the result of the disruptions in the repo market during this time period. Fails to broker-dealers and clearing organizations on both the receivable (+1bn) and payable (+\$7.6bn) sides increased as well as a result of the disruptions.

The other large drivers of balance sheet changes were Financial Instruments owned (+\$13.1bn) and Financial Instruments sold (+47.3bn). Customer payables increased \$11.6bn due to an increase in fails (\$5.4bn) and an increase in customer and prime broker shorts (\$5.6bn).

Stockholder's equity increased \$2.3bn, mainly due to the issuance of \$1.9bn of preferred stock.

Long inventory owned increased by \$13.5bn to \$326.7bn. Main drivers included:

- An increase of \$4.8bn of municipal bonds from the TOB program
- An increase of \$6.4bn of US loans (corporate debt)
- A decrease of \$2.5bn of whole loans in the US
- A decrease of \$1.1bn of resi securities in Europe
- An increase of \$645m of real estate held for sale. Total inventory was \$22.6bn, which would have been \$12.9bn if Fin46 consolidations had not occurred. Warehouse for private equity (~\$1.3bn) included here.
- An increase of \$9.1bn in OTC interest rate, currency, and CDS, mainly due to increases in Lehman buying and selling protection.

Short inventory increased by \$47.3bn to \$196.9bn. The main driver was an increase of \$28.1bn in US Treasuries and Agencies to \$74.7bn, as there was a flight to safety. These are Lehman's positions as well as execution for customers.

The Real Estate balance sheet declined slightly from \$56.0bn to \$54.8bn (\$22.6bn consolidated and \$32.3 non-consolidated). The decline resulted from markdowns and a few single asset sales. There were no big securitizations during the quarter. The non-consolidated assets are all fairly small, with the largest single position less than \$500m balance sheet. The consolidated assets (i.e., real estate held for sale) is more chunky, with the largest positions being Coeur Defense (\$3.2bn) in Europe and Prologis (\$1.7bn), Beacon III (\$1.4bn), 237 Park (\$1.2bn), and Rosslyn (\$1.1bn) in the U.S.

### Investment Management Results

D. Colao is the new CFO for IMD (didn't catch his first name) and provided the briefing on IMD's results.

IMD had record quarterly revenues of \$968m. Asset management had revenues of \$618m, due to minority stake revenue. DE Shaw was up \$52m. PIM revenues were \$351m. AUM decreased 2% to \$277bn mainly due to market depreciation within equities.



Two funds closed, including LBREP III (real estate equity) at \$1.5bn and Secondary Opportunities II at \$1bn. These are private equity limited partnerships and are not reflected in AUM.

### Investment Banking Results

Gary Fox was out of the country, so Matt Foley provided the briefing about IB results.

The overall market environment for M&A, equity origination and FID origination was weak. Convertibles activity did spike driven by several mega Financial Services issuances. While market volumes fell across all product categories, Lehman volumes were better as they were ahead of 1Q07 except in M&A completed volume which was down versus 1Q07 (which included \$100bn ABN AMRO/Barclays transaction).

IBD revenue was \$867m for the quarter, up slightly over 4Q07 and 1Q07. Healthcare, industrial, and technology were the best performing industries. Lehman had its largest ever international revenue percentage at 38%. The growth of non-traditional revenues such as RSG (?) and hybrid securities issuance has helped offset weaker markets for traditional offerings.

Details by product are:

- Equity underwriting was \$215m on strong convertibles, secondary, and derivative activity offset weaker IPO revenue.
- Leveraged finance was \$76m, with the highlight being the bank loan for Firth Rixson (\$13m).
- Debt capital markets was \$246m driven by strong gains in derivatives and FX transactions. Highlight included Fannie Mae preferred (\$30m).
- Financial advisory was \$330m, including MGI Pharma sale to Eisai (\$28m), Cognos sale to IBM (\$25m), Imperial Tobacco acquisition of Altadis (\$20m) and Aluminum Corp of China acquisition of a stake in Rio Tinto (\$19m).

### Capital Markets Results

Fixed income revenues were \$262m and equities revenues were \$1.41bn. FID was down mainly from asset writedowns discussed above. Equities had its second highest revenue quarter on record revenues in Flow Volatility Americas offset by lower Prop Trading and Origination results.

Gerry discussed the residential real estate space. There was \$5bn of long/short trading in March, mainly in Alt-A resulting from Peleton trading. February marks were in the 70s, and the trading gave lots of price discovery. On single name ABS CDO, there were some better visibility resulting from Peleton unwinds,

although Gerry said they have always had transparency through consensus services. \$18bn (or is it \$1.8 – 18 sounds too big) of assets were sold the last week of February in the market. Tranches rated AA and A had more trading in March, and there were lots of distressed bids.

In the commercial real estate space, Lehman was in the market with a fixed rate securitization as of the time of our meeting. Lehman has a lot of floating rate mezz pieces, which they planned to sell during 2Q.

Leveraged loans were generally marked in the high 80s. There had been some sales, and Lehman's exposure was going down. They had provided financing to private equity buyers on \$1bn of leveraged loans, usually with a 20-30% haircut on junior pieces.

Detail on FID revenues:

- Liquid Markets had revenues of \$1.18bn, up substantially. Roughly half of this was due to client revenue and half due to position taking. Lehman had been well positioned for curve changes.
- Credit Products had revenues of \$410m, including a loss of \$140m in HY. The decrease was driven mainly by declines in Contingent Acquisition Facilities.
- Muni Bonds had a loss of \$241m caused by basis losses as munis underperformed treasuries. They had a \$200m loss the last week of the month.
- Energy trading had revenues of \$52m, driven by a negative GAAP adjustment of \$60m for transport and storage contracts.

Detail on Equities revenues:

- Execution services had revenues of \$650m, including \$403m in the Americas on record client revenues and strong trading in Flow Volatility.
- Within the Volatility division, revenues were down to \$267m. There was weaker client demand for structured products and losses in single stock exotics in Americas. Europe and Asia had benefited from the run-up in the Hang Seng, and Asia saw redemptions of structured notes as these are generally a bull market product.
- Equity Strategies (prop only) revenues were down to \$14m as they were long indices in Asia, India, and China.
- GTS-Equity had revenues of \$417m on KSK private equity position in India.
- Private Equity had a loss of \$211m, which includes IMD private client losses.
- "Equities Other" had a gain of \$228m. This includes \$40m for the Global Opportunities Group run by Ben Fuchs and a share of the mtm of Lehman's debt.

Gerry discussed that they had taken \$1bn out of the budget given the downturn in the markets. They have also taken risk down, although VaR is at its limit, the Flow Vol business is the driver. Gerry said that the risk appetite limits will be formally adjusted. The plan is to reduce balance sheets, for example net assets in equities will go from \$66bn to \$40bn.

## **Liquidity and Funding**

While Paulo provided the normal quarterly Liquidity and Funding package, we did not discuss it during the meeting given that we have been getting daily liquidity information along with frequent discussions.

Instead, we focused the discussion on a list of Special Topics that were focused on actions recently taken and/or expected to be taken with respect to further enhancing the firm's liquidity position and de-leveraging the firm.

### **I. 2008 Preferred Issuances**

This discussion focused not just on the recent \$4 billion Non-Cumulative Convertible Preferred issuance in March 2008 but also on all the preferred and other non-common equity (i.e. hybrid) instruments issued by Lehman as they make up a significant portion of Lehman's total Tangible Equity. This has had implications with respect to the credit afforded these instruments by S&P and Moody's.

Treasury wants to get out the message that their equity (or permanent capital) is higher than many think (wasn't sure if they meant through the capital calc disclosure or if they meant just getting the rating agencies comfortable with the size of their overall preferred issuances and trying to get full credit for this from the agencies?)

#### Tangible Equity (i.e. permanent capital)

Lehman's Tangible Equity (pre deduction for goodwill and intangibles) stood at \$29.8 billion at end of Q1 2008 and up to \$33.8 billion (if including the \$4 billion issuance in March 2008). Of the \$33.8 billion, \$21.8 billion is common equity, \$6.99 billion is preferred, and \$4.98 is junior subordinate notes.

The preferred (including \$4 billion issuance) makes up 21% of the Total Tangible Equity. When you add in the junior subordinated notes you get 35% of the Total Tangible Equity. Paulo stated that Moody's and S&P approach is that firms should generally not have more than 25-35% of their tangible equity made up of these hybrid instruments. Paulo plans to have more dialogue with the rating agencies about these instruments and he said "the rating agencies need to get comfortable with the preferred". He did say that Fitch has already

said they will give 100% credit for the \$4 billion. Moody's and S&P basically have said that they were glad Lehman did the issuance and that they will be thoughtful in their analysis about this but it is "outside of guidelines".

Preferred issuances:

Of the total current preferred stock issuances outstanding (\$6.993 billion), \$5.9 billion come from 2008 issuances: \$1.9 billion non-cumulative preferred issued in February and \$4.0 billion non-cumulative convertible preferred issued in March 2008. These issuances are all treated as Tier 1 capital for regulatory capital purposes (assume we have no issues here?).

Regarding the recent \$4 billion issuance, Paulo said it was immediately dilutive and fully reflected in the EPS calculation. He also said they actually had \$15 billion in orders (I think we heard \$12 billion previously) and that it was issued 16% cheapness (which was in the normal range of 10-25% for such an issue). **(Lori/Michelle-do you know what this means?)**

The \$1 billion of preferred outstanding prior to this year was "cumulative" and so didn't qualify as Tier 1 capital.

They don't expect to do another preferred issuance this year, at least in the U.S. They may do one in Eurodollar, where the normal size of the deals is \$300-500 million.

Junior subordinated notes:

Paulo described these notes as typical instruments issued in Europe and that under almost all Basel II regimes deemed Tier 1 capital. The buyer base for these notes is different (European and Asian retail investors) from their normal plain-vanilla debt offerings adding some diversification away from institutional holders. Paulo viewed these as very cost effective permanent tax-deductible instruments.

## **II. Freedom CLO**

We discussed the Freedom CLO in more detail during this meeting. We confirmed that currently none of the senior note tranche is pledged through the PDCF; rather it is being financed through overnight/open repo in the market (didn't hear who the counterparty(s) were). That said, they had pledged the senior note to the PDCF 3 times previously.

The idea behind the structure was to transform loans that were not PDCF eligible or easy to repo into a security that was both PDCF eligible and easier to repo in the market. The structure was very simple-just two tranches: (1). A

senior tranche of \$2.26 billion rated A2/A (Moody's/S&P) that is eligible for the PDCF and (2). Unrated subordinated note (equity) tranche of \$570 million.

This CLO is not a "static" CLO; rather Lehman can substitute collateral. Paulo said that this made the structure flexible for them as they could pull out loans that they had interest in from buyers and substitute in other loans. The equity holder (Lehman) of the CLO has a lot of control in the composition of the portfolio.

Currently, Freedom has a diversified set of corporate loans across industry and issuer with the largest issuer concentrations being, CDW and First Data (12% and 11% respectively).

#### Future plans:

Paulo said that they are likely to issue a Freedom II for another \$2 billion to monetize more of the corporate loan unencumbered collateral.

In addition to structuring CLOs from the underlying corporate loan positions, they have sold \$1 billion of leveraged loans to private equity firms while financing them (I believe at 20% haircut-can confirm at the monthly meeting). The financing is between 5-7 years, with most of the loans made to SPVs created by private equity firms for buying back debt on their own deals. Paulo said that there is another \$1 billion of this type of sales (with financing) in the works. That said, from a liquidity perspective he favors creating the CLOs because they get a much higher return of cash in that case (although without the PDCF, the stability of that funding might be in questions-as stated above currently all open/overnight in the market).

Paulo said that the other area where he expects to see more sales (with non-recourse financing) will be in the commercial whole loan space. Real estate funds and other investors will want some amount of non-recourse financing when buying these loans. (We can follow up with Credit on the haircuts here.)

### **III. 2008 Long-Term Capital Plan**

This is basically a story of de-leveraging across the firm. The current plan calls for an aggressive de-leveraging strategy which they plan to reduce cash capital usage by \$16 billion, from \$149 billion down to \$134 billion, in the 2<sup>nd</sup> quarter. They expect that to be in a \$15 billion cash capital surplus at the end of the 2<sup>nd</sup> Qtr with the assumption that they will not issue any more L-T (excluding Structured notes) debt the rest of this year (on our weekly call 4/16/08- Paulo said \$10-15 billion). Of course, they will issue if the opportunity arises (i.e. new issuance spreads come in).

On the Structured notes issuances- Paulo quoted a run rate of \$400 million a week but on the weekly call on 4/16/08 said they have returned to net issuance on structured notes and the most recent week had between \$200-300 million issued. The \$400 million must have been related to the average issuance in the 1<sup>st</sup> Qtr. (At the weekly call they said they expect between \$1 and \$1.5 billion in net issuance for the 2<sup>nd</sup> quarter.)

The break-down for reducing cash capital usage is as follows:

Fixed Income: decrease cash capital uses from \$103 billion to \$97 billion  
Equities: decrease cash capital uses from \$16 to \$14 billion  
Other: decrease cash capital from \$30 to \$23 billion. (This category includes principal investments and prime services.)

We asked how they plan to reduce the other category given the less liquid nature of principal investments. Paulo discussed the idea of possibly spinning off a trading principal group into a separate fund (which they would probably prime broker) that would eventually get third party money. **(Lori/Michelle- I had a couple of other points here that I couldn't make out).**

In this vein, we also talked more generally about the unencumbered collateral. Paulo stated that if the unencumbered collateral is "not in the box" they charge it with 100% cash capital usage, but that if it "is in the box" and available to be secured funded, the cash capital usage would go down significantly (I assume it would then just be for stressed haircuts-confirm). (We confirmed that this would be the case on the 4/16 weekly call even if the collateral isn't allocated out on tri-party due to operational issues.)

Overall, a large part of the de-levering will likely take the form of restructuring of unencumbered collateral into securities. If need be, they could also reduce financing to customers but I assume that is not in the current plans. Paulo also discussed an interesting idea of securitizing swap receivables (he brought up the \$2 billion in Republic of Italy current receivable as an example). He said that UBS has done one of these before (\$750 million I believe) and the big issue is the operational aspect of this.

Paulo addressed the cost (mostly rating agency costs) and time associated with restructuring the unencumbered collateral and stated that this is why they hadn't focused on this issue before ("if you don't have to do it you don't because of the cost and time").

This discussion around swap receivables led us to discuss the liquidity mismatch of sourcing protection from counterparties like monolines. Paulo said that as a result of charging the business Libor + 120 bps on derivative receivables, there was plenty of incentive to the traders to intermediate with

others (they mentioned ML in this context). He considered this a big success on the part of Treasury at Lehman.

#### **IV. New Capital Allocation Methodology**

In 2008 (actually the week after our meeting), the Firm is rolling out a two tiered charge for cash capital usage including an equity usage charge for less liquid assets and a LTD effective rate charge for remainder of cash capital usage.

The Firm is also rolling out a new cash capital limit framework with “penalty rates” assessed for exceeding cash capital targeted usage at the business level.

##### New Equity Allocation Charge for Less Liquid Assets:

This new charge is based on an equity allocation framework which reflects the amount of equity capital required to enable restructuring in crisis outside of bankruptcy without access to unsecured debt. *(Not entirely clear about the approach. It sounded as if Paulo was saying that this would be the additional equity cushion that would be required to enable them to “contribute the rest of the firm to a securitization structure (basically sell in a securitization). I have that the restructured B/S is to be funded with equity and IG collateral (i.e. the assumption that IG assets are easily saleable or financed-obviously this would assume the PDCF stays around). Probably need to understand this little better.)*

The model incorporates both risk and liquidity considerations and can be applied at different levels of granularity: the Firm, divisions, businesses, and even trades.

The required equity within this framework (and for which they will now start charging the business lines is laid out in the following equation:

$$\begin{array}{l} \text{Available equity} \qquad \qquad \qquad \text{Required Equity} \\ \{ \text{Common equity} + \text{Hybrid Equity} \} - \{ \text{trading} + \text{counterparty} + \text{operational} + \\ \text{less liquid} + \text{Impairment} + \text{Target Surplus} \} \geq 0 \end{array}$$

*(Looks a lot like economic capital to me although the “less liquid haircuts” being charged now in the first phase of this framework seem to be a very significant component of the required equity (See pages 9 and 10 of the presentation for details). The Trading charge is 99.7% VaR for a longer time period; the Counterparty (from Risk Appetite); Operational (from Risk Appetite). I don't believe they stated what target surplus they have set.)*

They expect that they will be the only firm on the street charging the business lines for equity capital. They will charge each of the business lines and then credit it back at the FID level (for example). The previous budget for the cash capital charge to the business lines was Libor + 45 basis points (which generated a \$945 million charge to the businesses for cash capital) which has recently been increased to Libor + 75 basis points (resulting in incremental \$447 in charges- mostly to FID). The equity allocation (@ 500 basis points over LTD rate) generates an additional cash capital charge of \$949 million) bringing the total charge to \$2.064 billion to the businesses.

In 2008, the equity allocation will only be applied to less liquid assets to create a greater focus on the firm's liquidity in the current operating environment. These equity charges however will remain in place going forward and they hope will provide a strong incentive to bring down cash capital usage.

#### Cash Capital Limit Charge:

In addition to the higher overall cash capital charge (including the equity allocation for less liquid assets), to further ensure that de-leveraging of the B/S takes place- they have new cash capital budget limits set for each business unit for each quarterly period of 2008 that are consistent with the de-leveraging targets.

The charge for violating the limit is very onerous- 300 basis points over LIBOR, for all of the excess cash capital usage. This 300 basis points is based on a 2-yr projected average cost of funds for the Firm.

#### V. Other items:

a. New Short term stress measure (working on-includes loss of secured funding)

We are planning on having a conference call on Monday April 21<sup>st</sup> to discuss this in more detail. Nothing was presented at the quarterly meeting.

b. MCO:

We discussed briefly the MCO presented in the Feb month-end Finance Committee Package. The contingent section of the MCO appeared to be light with respect to inclusion of charges with respect to contingent collateralization on derivatives (only \$100 million), other outflows (\$100 million); Contingent Commitments



(pre-funding) (\$1.2 billion); and nothing for relationship revolvers. Also, I didn't see anything for stressed haircuts either?

Paulo made some mitigating statements:

With respect to the lending commitments, Paulo said that 75% of this is done through the bank entities and thus included in their liquidity plans not the holding company. He also said some is funded through Aegis. Also with respect to the relationship revolvers, he noted that they are much easier to sell if they are actually paying a coupon (i.e. when drawn).

Overall, this area doesn't seem to be very conservative regarding the potential funding contingencies. (***Lori/Michelle-Do you all think this is a fair statement – if not I'll take out?***)

c. Lehman Brothers Commercial Bank (an ILC)::

They discussed their desire to potential move over some of the businesses (especially financing businesses) currently in the broker-dealer to the bank as a way to reduce the "secured fund stress scenario". They stated that they would like the 3-yr probationary period (which ends in August 2008) to be ended earlier and wanted to know our abilities/thoughts here. Is this a State of Utah issue or FDIC issue or both?

We said we would talk to you, Matt.

4/16/08

Lehman Price Verification meeting  
August 10, 2006

The meeting was led by Gerry Riley, the capital markets controller.

- Capital markets is responsible for daily P&L production, forecast P&L, and closes the books at the end of the month. They are also responsible for valuation, as part of daily P&L production, and this is the area upon which we focused in this meeting.
- Reporting to Gerry are Joe Gentile, who is the global FID controller, and John Neave, the global Equity controller. They are responsible for all aspects of those businesses – from daily P&L to more complicated valuations. Neeraj Chopra also reports directly to Gerry, and he heads the valuation group. The valuation controllers (Scott Goswami for rates, Brian Sciacca for credit, Jerry Shi for equities) report both to Neeraj and their respective global product controller (John or Joe). Gerry prefers this structure so that no product controller exists in a vacuum, i.e. focuses only on valuation or more routine P&L, and so that at the end of the day, he was one person owning each of the businesses (John and Joe) to whom he can direct any questions. (I'm a little unclear about the actual reporting structure, and apparently there is a reorg in process as they cannot currently provide us with an updated org chart. I'll update when this becomes available).
- Front-office traders are responsible for marking their inventory daily, and PC has a monthly formal price validation process. All variances beyond a specified threshold are documented and may be adjusted, with the any business-PC variance resolution falling under Scott Simon, the product controller (checking on who/where he reports). However, on a daily basis the "P&L guys" perform risk-based P&L explains.
- Lehman bases its valuation off of the fair value measurement, essentially sticking with levels 1,3, and 4. 1 is screen shot (e.g. equities), 3 is model with observable inputs (e.g. OTC equity, corporate loans, whole loans), and 4 is items with no observable markets and or inputs (correlation, fund derivatives, residuals). Lehman sets de minimis thresholds based on some sort of measure (PV01, market value, vega, etc), and then sets threshold based on fair value levels.
- About 18 months ago, Lehman set up a complex derivatives transaction review committee, initially to get a handle on EITF 02-3 – to ensure that decisions were being made consistently when judgment calls were made. This committee used to just include controllers, but now accounting policy and QRM attend as well. There are about 25-30 members, all at least at the VP level. The committee meets for 1.5 hours/week. The committee looks at absolute P&L size (all trades over \$5 million), P&L over a given percentage of notional (5% of notional on trades over \$10 million) and trades posing additional valuation issues. The valuation controller for an area is responsible for ensuring that a trade goes to committee if it qualifies, and if there is no specific valuation controller, then the product control manager is responsible. The product control manager presents the trade during the committee.

- At the May meeting, three trades were presented: 2 CPPI fund derivatives and a forward equity trade, where Lehman is paid on trade date and delivers Intel shares in the future, with the number of shares based on the volume weighted average price between trade and maturity date (committee determined that the trade was a derivative transaction, and that the \$500 million was considered short-term debt, putting the trade under FAS 155). Gerry noted that the valuation people tend to be fairly well-grounded in the accounting rules.
- FID walked us through the pricing variance for the month of May, divided into two categories- remarked and resolved. Remarkable was \$22 million in aggregate, and resolved (where there is a logical explanation) is \$50 million. We also walked through price verification coverage, again by levels (1, 3, and 4). Coverage may be given in terms of market value (esp. for level 1), or risk-based, which is a dollar figure derived from a greek. We also discussed recent price verification projects, such as re-calibration of cap/European swaptions skew – the entire portfolio now undergoes full repricing. PC gets a snapshot from Totem of the vol surface (through the submission process that we have heard about at other firms as well), and then tries to fit the LB skew model to the Totem prices. The model has 8 parameters, which PC fits to the Totem data through calibration. The model is then repriced with the new parameters and a variance is determined. Another project was to initiate price testing of commodities options. The list was fairly extensive, and can be seen in the presentation.
  - With respect to actual price verification in FID, governments are verified using independent prices. The same holds for core fixed income derivatives. Mortgage options, an area in which Lehman is one of the biggest (if not the biggest) players, are independently valued using Black Scholes with external inputs. PC has full access to RAMP, and use this for pricing purposes – their prices are then sent to Totem.
  - PC verifies all cash CDO was market value over \$1 million. They verify pricing on all synthetic CDOs – this tends to be done mainly out of London. They take yield curves from rates (verified by IRP rather than CDO controllers), and credit spreads from corporate credit (again, verified by credit controllers not CDO controllers). The CDO controllers are responsible for using consensus data provided by mark-it to generate CDS spreads, PV01, and correlation for various attachment points and maturities, and those are then submitted to Mark-It who returns the consensus data, which can then be compared to Trader's marks (I think that the CDO controllers actually do this, right?) For a synthetic CDO squared, controllers will create a proxy CDO (adding up all mini tranches and netting overlapping credits) and model it. They will then run a Monte Carlo simulation to find corresponding attachment points. The goal is to figure out the subordination level of the proxy that will make its survival probability at maturity the same as the CDO master tranche (i.e. even

- though PC is doing the actual proxy pricing, it arrives at the same results as the desk). The proxy model results are sent to Totem for aggregation.
- For leveraged loans, if they are liquid, external prices are obtained. If they are illiquid, then PC benchmarks the position to similar securities based on underlying assets, duration, and credit rating.
- Equities had a slightly different summary, which highlighted all areas that had a variance over \$1 million, taken from a monthly packet given to the head of equities. This packet tends to focus on the change in variances month of month. Much of the variance tended to be in the volatility business. The summary also included global price testing results broken down by region (as opposed to products in the previously mentioned section), and price testing coverage (99% for trades where variance is based on market value, and 83% where variance is based on risk sensitivity). In testing dividend assumptions, PC tests 20 large positions. Recent projects include improvements in the convertibles space (established a hierarchy of vendor pricing), and improving accuracy of index and single name vol testing by submitting more to Mark-it for consensus pricing. PC also increased coverage of price-testing to include skew sensitive trades, like large collars (the big Home Depot trade fell into this category).
    - For stocks, futures, and listed options, PC verifies through external sources. For OTC options, warrants, and equity-linked notes, PC uses an equity volatility matrix to get independent vols (this matrix gets implied vols for indices and single names by capturing vols for listed options with various strikes and expiries. It then creates of vol chart for each name). PC then compares those estimated vol levels with the trader's estimates.
      - Lehman described the pricing of a level-4 equity linked note, where the holder gets either a coupon or a put, depending on a threshold. They tested correlations and volatilities – 2Y historical pairwise correlations for the 3 stocks (6 correlations) were obtained from Bloomberg, and then a pairwise implied correlation was calculated using an alpha adjustment factor taken from MarkIt consensus. The trade was revalued with this implied correlation to find a price variance (it was revalued on the trader's original pricing model, the one that is approved by QRM). Volatilities were obtained from external sources, and the difference between the outside and front office volatility is multiplied by the vega sensitivity to get a variance. (difference \* vega = volatility variance).
    - For convertibles, Lehman using a pricing hierarchy – IDC, Bloomberg, Trace price, and then convertible.com. However, if IDC would put the variance over the threshold, then it is generally not used (this struck me as slightly odd, because if IDC is the best one would think it shouldn't be struck just because it causes the largest variance. However, Lehman noted that it's not an automatic kick-out, and often when the variance is high its one of the times when IDC is not that accurate).

LHB 9/14/06

Lehman Quarterly Financial Review – Q4 2007

Meeting date: January 18, 2008

SEC: Michelle Danis and Lori Bettinger

### Revenue summary

- Quarter revenues were \$4.4 billion, with net income of \$886m. Lehman expects similar results in Q1 08.
  - Investment banking was down due to lower advisory and debt origination revenues – equity origination was up.
  - Capital markets was up v Q3, but affected by writedowns in real estate and securitized products in FID (\$860m). Equities had a strong quarter (\$1.9b).
  - IM had a record quarter
  - Non US revenues were 62% of the quarter's revenues, which was the highest percentage ever. While Asia did have a tremendous year overall, this figure was driven by the underperformance in the US rather than outsized performances abroad.

### Balance sheet

- The balance sheet was at \$691b at quarter end, up \$32b from the prior quarter.
- Equity roll-forward: There was a net increase of \$890m.
- Long inventory
  - For governments and agencies, b/s growth was driven by global rates (\$1.1b increase) and there was a \$4.5b growth in non-US governments, which tends to be related to the hedging of the rates book.
  - There was a \$1.5b increase in US loans in the corporate debt category which was predominantly made up of funded HY loans.
    - The US Corporate loan inventory is currently \$14.9b. The biggest pieces are the \$2.1b Archstone term loan, \$600m in CDW, and \$500m in TXU.
    - Lehman has \$6.8b in short corporate bonds, which are hedges against long CDS.

← --- Formatted: Bullets and Numbering

- We asked where auction-rate securities would be found on the long inventory analysis, and it seems that they would predominant be included in the “CP and other money market instruments” line (we subsequently got a more granular breakdown of this category).
- For mortgages and ABS, total balance sheet increased from \$88b to \$89.1b. Within whole loans, b/s decreased by \$5b due to sales of senior tranches (included is that \$5b is a \$2b reduction in subprime). Sales were offset somewhat by additional securitizations that were not fully sold. Trading securities increased by \$3.5b, predominantly due to the Applebees deals (and \$600m of Golden Gate). Commercial real estate b/s increased by \$1.8b due to non-consolidated positions, including Hilton and \$500m of Archstone mezz.
- Total real estate b/s in the US is at \$32.4b - \$12.2 consolidated and \$17.2 non-consolidated. In Europe, total b/s is \$15b, the largest position being \$2b for Coeur Defense, and Asia is at \$8.5b. Globally, real estate is using \$56b of b/s. PTG makes up \$21b of that total.

Deleted: (Did they say that the muni ARS are included in the Muncipal Bonds category?)†

- Bank balance sheets

- LBB is at \$16.3b, LBCB is at \$6.9b, and Bankhaus is at \$23.7b.

### Lehman Acquisitions

- On the Q1 horizon – Lehman is going to sell their controlling interest in Champion Energy (a retail utility) which was acquired as part of the Eagle transactions. They are also looking at a \$50m purchase of an asset manager with \$3b of AUM in the US (HNW?), a carbon trading company in China, and a broker-dealer in Brazil. Other transactions that we were already aware of included a \$37m investment in TradeWeb, and the purchase of Vandermullen, an NYSE specialist. Incidentally, Lehman made \$400k on the specialist in its first month, which seemed to stun everyone. It appears that they looked at this as a break-even business, or possibly even a loss-leader (much of the diligence appeared to be around “how much will we lose” as opposed to “how much will we make.”) Apparently, the specialists get some sort of regular compensatory payment from the NYSE (I guess for their business going away?), somewhat akin to how all residents of Alaska get “oil revenue” payments.

Deleted: (was it \$40k?)

### Investment Management

- Record quarterly revenues driven by AUM increases and minority stake revenue. AUM currently at \$282b.

- Project Surf: possible acquisition of 20% of a manager with over \$100m in assets (I think this is a hedge fund)
- Troubles with LibertyView: As discussed in the January monthly write-up, LibertyView's Asset Advantage and Income Fund, both mortgage funds, have had significant losses and will shut down. All outside investors have either exited or in the process of having their investments redeemed.
- Troubles with Grange: Grange offered enhanced cash funds to Australian municipalities and these products have seen many redemption. Lehman is now the sole client of this fund, and will likely consolidate its assets (~\$90m). In addition, Lehman is going to take litigation reserves for Grange. Laura noted that Lehman is going to be doing a "lessons learned" for this acquisition, which has obviously proved problematic on a few levels. We'll follow up with this.
- As an aside, IM closed its MLP opportunity fund in October 2007, total fund size of \$700m. This is distinct from the "MLP book" held by the equity division within capital markets, which had losses in December and is 100% owned by Lehman.

## Investment Banking

- Lehman's volumes were down across the board except for M&A completed and leveraged loans. Revenue was down in equity origination, leveraged finance, debt capital market – it held steady in financial advisory.
- HY contingent acquisitions facilities at quarter end were \$9.8b, down from \$27b the quarter prior (a big driver of the decrease was Archstone which closed in Q3). In total, \$14.8 was closed in Q4, and \$10.3b was sold or syndicated. This left a closed inventory of \$15.3b. Cumulative net losses on LBOs were \$318m – gross writedowns were \$1.389b and were offset by underwriting fees, M&A fees, carry P&L, and hedges. That said, in Q4 LBOs resulted in a \$385 profit (underwriting fees more than compensated for write-downs and some givebacks on the hedge profit).

## Capital Markets

- The discussion was led by Clement, the new FID controller, and Frank, the new equities controller. Gerry Riley did not attend.
- We did not spent significant time in this area, in part because we have been having detailed capital markets P&L discussion during our monthly meetings.
- FID

Deleted: [I am completely confused by the analyses on p. 2 and p. 4 of Gary's presentation – not seeing how the \$9.8bn on p2, beginning of Q4 commitments, corresponds to the \$9.8b on p4, labeled "Q3 closed funded/unfunded deals, and where that \$15.3 on p4 comes from!"]



- The \$700m reserve for ACA hits two sections in FID – the CDO line (\$200m) and Securitized Products (\$500m).
- Energy trading made \$118m, in line with Q3 (\$123m) and up significantly from the same quarter prior year (\$6m).
- Equities
  - In execution services, the US performed well primarily due to one blind risk trade. Europe was strong on the back of success in EMG (Russia, Turkey, E. Europe) and Asia ex-Japan and India performed well. Frank noted that Japan cash equities is currently being reorganized.
  - Equity strategies had a good quarter – a long delta position on the Hang Seng drove their gains.
  - Equity prime services had good client flows and strong yield enhancement business in Europe.
  - GTS did well in Q4 on the back of Indian equities
  - Equity volatility deferral – Lehman is developing a plan of attack to take back this \$129m deferral (they reserved an additional \$60m at the end of the year to bring the total deferral to this amount). They are working with E & Y to determine how to claw it back. The business has established key metrics with both internal and external auditors. The first goal was to get 70% of the positions off of SNM to Euclid (over 75% has now been completed) and the second was to get at least 80-90% of P&L moved to back office P&L, which has been 100% completed. The desk is not out of the woods yet, but there seems to be comfort that the control environment has been enhanced.
  - January so far was slow with client flows declining and prop losses in Asia. ← - - -

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- Clean P&L
  - The MIS is now functional around clean P&L. There is a 48 hour period to get all 59 sign-offs, and then immediate escalation. In addition, there is now a daily “gut check” by a SVP to assess the risk of a HC backtesting exception. As part of the new MIS, Lehman is setting up a materiality early warning system to make sure that, for example, one small desk in Asia does not hold the entire process up.

## Liquidity and Funding

- Current market overview: The market feels challenging, and Paolo doesn't expect improvement in the short term. The Countrywide acquisition didn't provide the market with that much of a bounce, and the credit guys are nervous. As for long-term investors, the market is divided between the big money funds (PIMCO, WAMCO, hedge funds, banks) who want fixed rate debt and sovereign wealth funds who are looking for equity-like returns. Some hedge funds and banks are active in negative basis arbitrage, where they buy protection, and then buy notes to lock in the spread. The finite amount of money is driving price right now, as supply is ample.
  - For Lehman's mid-December \$4b issuance, they received \$7.5b in orders, with more names than usual. There were 2 lead orders – an Asian sovereign wealth fund and PIMCO (at \$1.3b, I think the Asian fund's order was larger than that). In all, there were over 200 allocations, mostly to money managers (fewer insurance or pension names than usual).
- Lehman has a \$50b issuance plan for 2008. Of that, \$25-30b is needed for anticipated b/s growth of \$60b, and is therefore considered to be more discretionary. Paolo plans to do half via structured issuances (e.g. equity-linked structured notes), and the rest will most likely be public issuance (the latter being the more discretionary piece to cover growth). This task is not yet "unmanageable or scary." Lehman plans to go to new markets this year, including Mexico, Russia, Brazil, and India.
  - Lehman currently has \$30b outstanding in structured notes, of which 25% are under fair value. We asked about the P&L volatility associated with it, and Paolo acknowledged this but considers gains on structured notes to be true economic revenue, unlike Martin who seemed to view it as accounting P&L. Paolo said that the current cost of funding for Lehman is LIBOR + 40, which is very in the money in the current environment, and the marks reflect that. He seemed to expect this cost at the end of the year to rise to LIBOR + 55, a level he considered acceptable. On average, a 100bp increase in funding costs will cost \$1b which is not enough to "break the franchise." Paolo suspects that there might be a level at which structured note issuance will have to stop due to P&L volatility, perhaps around \$50b (I think that's \$50b overall, not \$50b subject to fair value treatment which would lead to a much higher overall outstanding).
- Regarding the banks, Lehman is coming off their 3Y ILC probationary period which may allow more flexibility with LBCB, and they plan on continuing to

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grow Bankhaus (which is now basically the size of the other two banks combined).

- We discussed the plans for LBB now that Aurora is no longer originating mortgages. 65% of assets in LBB must be QTI, or qualifying thrift investments. This was easy with all the origination activities, but may be more difficult for now. However, Paolo said that for now they want to keep their options open on the bank, which has many licenses in place (ostensibly a sunk cost).
  - We also talked about Bankhaus. Paolo told us about a loan originated by Bankhaus for Imperial Tobacco, which Lehman was required to fund upfront (i.e. Lehman had to post \$1b in collateral before the loan even funded). This led Lehman to syndicate half the commitment to BBVA, who did not require prefunding. Bankhaus is considering raising \$3b in Shorshine funding (>10Y deposits, over \$1 trillion outstanding in Europe, Lehman currently has \$4b). Bankhaus is also looking at opening a Korean and/or Chinese branch/license. In terms of possible concerns, Paolo noted that while Lehman has a good relationship with the BaFin and is not worried about outright losing the depositor insurance, there is a small chance that Germany's depositor insurance could be challenged in the EU for being favorable to Germany at the expense of others (their insurance is privately managed but government backed). However, this would not be a Lehman-specific event, and would have all sorts of other German banking implications.
- Q4: Lehman issued \$11.3b of LTD. For 2007, they began with \$78.4b, issued \$63.4b, and ended with \$118.2b (\$23.7b matured). In December, Lehman was able to issue sub-debt with a premium of 15-25 bps, which they seemed to be comfortable with.
  - Cash capital – at the January monthly we saw that the cash capital excess had dropped post quarter end, when it was at \$8 billion. This was due to the funding of Houghlin Mifflin as well as LTD coming due. At Q108 end, Paolo is expecting a surplus in the \$4b range.
  - Liquidity pool – as of November 30, it stood at \$34.9b. One change in calculation worth noting that as of Q4, Lehman is no longer counting AEGIS (the Lloyd's wrapped conduit set up to participate unfunded loans) in the definition of the liquidity pool. It is not really unsecured debt, and Lehman is looking at restructuring this facility. As more loans in the market are funding at close right now, this facility does not work as well, and they want to change the conduit's issuance so it is no longer extendible (obviously, it is much harder to place extendible paper right now).

- There were three weeks when Lehman was out of compliance with the MCO policy, which coincided with the Archstone funding and delay getting the money in (possibly from Fannie and Freddie?).
- Contingent liquidity risk update
  - Unfunded HG commitments: \$23.9b, 150 counterparties, average facility \$160m/name
  - Unfunded HY commitments: \$14.2b against 250 counterparties, average exposure less than \$60 million
  - Contingent HG acquisition facilities: \$10.2b against 8 counterparties (still consider these to be readily syndicated)
  - Contingent HY acquisition facilities: \$9.7b against 16 counterparties
- Tender option bond program (via a subsequently (1/30/08) emailed presentation)
  - Currently, Lehman's program has about \$7.2b in floaters against a bond market value of \$8.1b. The floaters have a 7 day put option which is effectively to Lehman.
  - In terms of municipal bonds deposited into the trust, 54% are Lehman's and 46% are done on behalf of customers (i.e. customers purchased the underlying tax exempt bonds and Lehman deposits these securities into the trust on the customers' behalf).
  - Of \$913m in residuals/IO (which effectively have the market risk as they take the first loss), Lehman has \$81m and clients have \$832m.
  - Lehman is exposed to a downgrade of either the muni itself or Lehman (while the downgrade trigger is below investment grade, Lehman thinks that in practice if their rating fell below A1/P1 the put would be exercised).
  - If the trust receipts did not roll, Lehman thinks other buyers would surface. 40% of the \$450b in tax exempt money market funds is in these TOB programs, and there are few other asset options for these managers. The top 5 holders of the floaters are big players (e.g. Fidelity, JPMC, Vanguard). The receipts can also be repoed if necessary.
  - So far, there has not been a failed remarketing. There is also over collateralization, as seen in the program numbers above.

- With respect to the monolines, only 31% of the underlying bonds are guaranteed. The trust receipts themselves are not wrapped by monolines.

#### **Regulatory update**

- LBIE went to Basel II this year, and is aiming for a capital ratio in the 140s (apparently Europe is floored).
- Neuberger Berman – the plan is to decrease the excess capital (currently \$193m) over the year

## Notes on Discussion with Gerry Reilly on mortgage residuals, 10/20/06

As part of the quarterly P&L review, we discussed Lehman's mortgage business with Gerry Reilly, with a focus on the mortgage residual position. During 3Q06, mortgage revenues were down 34% over 3Q05. Securitization volume was good, but they struggled in their origination platforms, especially in the subprime space. BNC, Lehman's subprime originator based in California merged with Finance America, causing some staff to leave. Loan production was \$1bn (month, quarter??) compared to \$24.8bn at BNC in 2005.

Another issue impacting Lehman during the third quarter was putbacks by investors. Over the summer, BNC was hit with a \$65m rep & warranty claim on BNC sales of whole loans to third party investors. Gerry commented that there are now firms popping up to find putbacks, and the trend will continue to grow. The lesson learned is that more attention needs to be given to underwriting. We will follow up on this issue.

The amount of residuals retained by Lehman has increased over the past several months. One factor is that Amaranth was Lehman's biggest investor in subprime resids. The general practice in a mortgage securitization was for the desk to sell the senior piece, and hold the NIM for a month. After 1 month, they would sell the NIM (rated piece with a maturity, also called the front end residual) and keep the back-end (or "baby NIM"). Now the desk is keeping the full residual (NIM plus "baby NIM"), although they have had some success at selling some of the NIMs in October. The collateral backing these NIMs consist of subprime or option ARMs (get exact percentages and exact market value). Lehman wrote down some subprime residuals originated by both BNC and third parties by \$18m as a result of poor performance.

Lehman also sells residuals repacks. In this case, the desk buys some residuals from Barclays, and they are resecuritized. Hedge funds typically purchase these. [Are these being retained as well?]

Gerry related that Lehman does not take a gain on the securitization until the residuals have been sold. [confirm this]

Michelle Danis, 11/15/06

Lehman Quarterly Price Verification Meeting – Fixed Income Division  
January 7, 2008

For SEC: Lori Bettinger, Michelle Danis  
For Lehman: Neeraj Chopra, Joseph Sapia, \_\_\_\_

We discussed price verification results for November 2007, Lehman's year-end, for the Fixed Income Division in general with a deeper dive into the Mortgage products results.

Neeraj gave us an update on the growth of the valuation group. In the US, there are currently more than 30 people, 14 of whom are at the VP level or higher, in the group. London, headed by Dunston Gothen (sp), an SVP, has 20 people. Asia has around 10 people. In India, they have 15 people who cover global books under the direction of regional controllers. For example, within the FX space there are 120 currency pairs that need to be verified and regional controllers verify the most material pairs, but as they have expanded the scope of their verification efforts they have had personnel in India perform the work under their direction. Personnel in India have also worked on deal review. By the end of the year Neeraj expects to have 80-85 people globally.

Interesting trades to note:

- The most significant valuation adjustments during November were the counterparty credit charges associated with ACA and XL. They are taking 95% reserves on trades with ACA and 25% reserves with respect to XL (although Neeraj pointed out several times that Research believes Lehman will have 100% recovery with XL).
- They changed the calculation methodology for the Reps and Warranties adjustment to incorporate an increase in expected losses.
- They are taking a \$30m valuation adjustment on the Italy trades to account for more funding reserves given recent market events.
- They have greatly expanded the coverage of products verified in the commodities space. In addition, they have initiated coverage of the Eagle Energy business.







General practices across the (ANC) desks.

- Overall contemporary risk is managed via combination of trade by trade margin as well as portfolio PE (delta) which would account for non-marginal trades.
- Delta approximates and substitutes for PE delta for non PE (CDOs) and non PE (CDOs) and delta.
- PE desks tend to subdivide the more complex trades (Emp) about an different cases: curve basis, in more complex products (branch), in more shared products (branch), in more shared products (branch). Firms used to apply portfolio margining, based on historical data series.
- Credit is a credible proxy for PE credit, but has been verified to be credit, based products. Margins for credit trades by a branch chief (this is also proxying initial margin on documented as a case-by-case basis, depending on the trade size).
- Lately, margins for CDS have tended to be changed quite often. This is in response to spread volatilities PLUS liquidity changes. More so on some times than others.
- A typical grid or margin table specifies the charge as % of notional, by spread level and trade maturity.
- CS do not collect protection on trades when CS had old protection. Other firms do collect a margin when selling protection, especially on high spread names, to protect against spread tightening. This charge is usually much less than, if buying protection.
- The following describes how CS develops the table, other firms will have roughly similar analysis.
- CS do not collect protection on trades when CS had old protection. Other firms do collect a margin when selling protection, especially on high spread names, to protect against spread tightening. This charge is usually much less than, if buying protection.
- The initial margin is meant to cover a "reasonable worst case" MTM over the close-out period can be a few days after default. Typically, the at risk period is assumed to be two weeks, but exceptions (Emp) have been made for structured credit. The standard way to figure the "worst case" is to use the 95% CL, but is different for structured products.
- For single name initial margin is based based on the greater of 1) the PE result of a two week, two standard deviation spread move, based on an analysis of historical data going back to 2001 for 240 obligors, and 2) for names with spread greater than 400 basis points, the expected loss on the underlying using risk neutral default probabilities (i.e., just looking at the underlying and ignoring collateral collected from the counterparty). This second component is aimed at potential idiosyncratic jump to default.

From call (05-07 - include here too later call)

Greg Hepper just called. He has confirmed internally that our plan to continue as before is okay with all concerned. Will be sending in the PE report on CD shortly.

- Identify discussed some topics to include in our quarterly discussion.
- Notes case - which are the notes from the call, are being drafted, right or a CDS or options.
- They're using exposure by risk factor (duration vs. credit) to manage CE and they probably a report related to that. We'll talk about that as well.

We'll do this up after we get the PE report and pursue that.

We spoke with Greg Hepper yesterday to discuss the nature of our future interaction.

- We proposed the option that requires the least bit of updating and spending, namely continue more or less exactly as before - quarterly and some ad hoc conference calls; production and submission of the PE report.
- We assumed quarterly that from the PE report which through we would be responsible to think for what to avoid, which the appropriate people to make sure. Assuming that change, we'd set up a call shortly after the collaborative work-related matters.

On a more general note, the market remains apparently not coming there (yet) to work on either any PE methodologies (but will take up the discussion later). I have called them to clarify various margin situations (yet to do details). Notes were also to discuss greater cooperation.

Let's, Steve, please add an necessary - Steve.

Rebut 9/23/08 - Q1 to Greg

- Most concerning aspects re: methodology, measurement, metrics, from recent market moves
- importance of trade measurement - measurement risk, with a minor caveat.
- avoid methods, risk, spread vs. risk, duration, liquidity premium
- for clear metrics (single name basis?)
- more attention to writing style?
- more attention to their contemporary evaluation of credit quality
- [quant default?] and attention aspects on required margins, capital
- i.e., current approach to capital and margin are probably based on margin volatility of the (ANC)'s credit-line dependencies. We'd discuss performance and all potentially may get larger and the expected default also get larger.

What changes, if any, contemplated?

- discuss above in terms of PE analytics as well as margin analytics
- e.g., we spoke with credit derivatives margins before, i.e.

When do these reports re-materialize

- look at last report, frame it.

Read up metric, come up with vs.

Overlap with CVA metrics - similar, evade.

Call with Greg - re: Credit Derivatives Margin methodologies

5/1/08

Call with Greg, Chris, Helena and Mike (7) about the CDS product team in Credit

Empire started by saying this would be the first quarterly call on margin methodologies changes. P.C. clarified that he thought we would only need one quarterly call to cover PE valuation, but that we simply wanted to add this as a potential item. The focus of this call was on CDS BC when there has been a lot of focus recently.

We basically discussed the work analysis that goes into using the initial margin schedule across the CDS product areas (plain vanilla CDS, Corporate Tranche, and CDS in ABS). The plain vanilla margin schedule is largely based on historical statistical analysis of spreads, the Corporate Tranche schedule is based on a combination of some quantitative analysis and subjective judgment, and the CDS in ABS schedule is largely subjective. A couple of general (non-product specific) points:

For each of these product areas the variance margin is simply based on the change in MTM on the positions (not that the initial margin couldn't be estimated). [This of course is more for hedge fund BC' dealers that do not exchange initial margin with one another and margin process is based on CDS thresholds]. Thus the focus is on using initial margin.

Credit goes on to do an additional - or portfolio margining for franchise business (system derivative product brokerage where that is actually the case). Margins collected on a trade-by-trade basis with an portfolio basis. Helms said that there are some one-off cases where a client will want to do a jump trade (both legs at the same time) and Credit will do an ad-hoc analysis for the initial margin. But, for instance, if a commodity adds a risk reducing trade (to an existing portfolio) the margin requirement will not go down (and may even go up). However, risk reduction will be reflected in the PE.

If that is the main reason for the "bustle" of payment by the counterparty portfolio, and one also fully update with the counterparty, then the net credit exposure, post collateral would fall by even more. It is not so simple, some reduction in credit exposure may occur because of possible diversification, but the benefit would need to be realized.

CDS is general on an issue where the margining process requires some active attention (as opposed to Basis or PE BC) where it usually the things are pretty much as simple.

→ They repeatedly described the Credit Derivative area as being less mature, and subject to greater changes in liquidity. In the "mature" area, margin terms are generally left unchanged.

The Credit team talks to reduce about liquidity and market conditions, risk is managed BC" with the other dimension being PE. Greg would be happy that some firms the independent credit risk department is really only managing along the exposure dimension, as the credit department do not set the margin terms (it is in fact correct).

Credit goes on to say that margin is not of two main dimensions by which risk is managed BC" with the other dimension being PE. Greg would be happy that some firms the independent credit risk department is really only managing along the exposure dimension, as the credit department do not set the margin terms (it is in fact correct).

→ The initial margin is meant to cover a "reasonable worst case" MTM over the close-out period, the close-out period can be a few days after default. Typically, the at risk period is assumed to be two weeks, but exceptions (Emp) have been made for structured credit. The standard way to figure the "worst case" is to use the 95% CL, but is different for structured products.

Plain Vanilla CDS

For single name initial margin is based based on the greater of 1) the PE result of a two week, two standard deviation spread move, based on an analysis of historical data going back to 2001 for 240 obligors, and 2) for names with spread greater than 400 basis points, the expected loss on the underlying using risk neutral default probabilities (i.e., just looking at the underlying and ignoring collateral collected from the counterparty). This second component was picked as a means of capturing more idiosyncratic risk.

→ Spread risk before the default - jump. The 2nd component does not get up to the early part, and is more what that should be based to names whose spread have already widened.

The historical analysis involved looking at two week spread moves and backing names into cohorts in order to come up with an initial margin table by spread level (we didn't go into the details there). For instance, a 3-year trade with an underlying spread of 400-500 basis points will extract initial margin in the range of 5% of notional. They are sending in the table (and tables below).

→ Not completely clear on how the "typical" of it is actually estimated, but above description is what we heard.

For corporate CDS initial margin is only collected when CS is buying protection (see note, but is worth differentiating from ABS below).

The corporate CDS schedule has not been revised as a result of the credit crunch. Credit has looked at the data and remained comfortable with the existing schedule (BC exactly same when the initial historical analysis was BC 3 year and 800 bps ago) below.

→ Was done in 2002-03. Claimed that recent moves are in the same range as those.

For Corporate indices the approach is the same, but without the second (expected loss) component [since there is no ITD equivalent for an index, also because that index spreads tend to be less volatile and less prone to jumps (diversified)].

Corporate Tranche

The ultimate metric is also a schedule, where the percentage (notional) of total margin is a function of tranche attachment and exhaustion points and tranche maturity. However, Helms said given the tranche, maturity, and current market level, the initial margin is determined. This is not so clear as the table is referred as spreads move, or if there are different tables for different spread levels. Helms stated that there are different tables for different indices, hopefully all of these details will be clarified when they send us the tables.

For bespoke Credit has to do some specific analysis of the individual trades.

Initial margin used in creating the table, three tables were recently revised. [P.C. I think] have good sense on the old methodology, which Greg described as "Wikipedia BC" but too to note if you want.

→ We were looking around metrics as that (C). The key was that the observed price moves of the tranche differed from model predictions, so we used an improved model case (CDS over the 800 - market default recovery), modeled some kind of rating. This was particularly problematic since some counterparty portfolio would contain "long-short" positions across the "optimal structure".

→ This was a response (reactive) to any question regarding the extent to which liquidity considerations influenced the required margin.

A 5 year mezzanine high yield index tranche currently pays 37% initial margin.

ABS CDS

For mezzanine, credit has basically thrown out historical volatility all together and goes with an approach on the far end of subjectivity. As a starting point, they are using the initial margin to include the largest 3 to 4 week move (didn't specify whether spread or price) to date, and based on top of that is some extra protection above fitness volatility BC" where again they had a lot of discussion with traders.

Credit actually increased the initial margin on some tranches (A and AA RMBS) after the credit crunch (ad before spreading of the initial margin).

→ This is CDS, incorrectly measured margins.

The approach was described as very simple but very conservative.

In the case they are collecting initial margin when selling protection as well as when buying.

→ Greg observed that "different models could yield very different numbers" but also that "technically are very important" (leading to significant divergence between observed moves versus model produced moves).

Call with Greg and John Daniels, Thu, May 1

Spoke with Greg and John re: possible extensions to PE report. John works on the reporting side of things.

1. Narrative, explanation of counterparty that have experienced large PE changes, relating those PE changes to market moves.

→ Obviously, this is easier for counterparties with "simple" portfolios, but for "diversified" counterparties whose risk arise from numerous risk factors, so direct analysis is problematic. John said that, as a monthly basis, they review those counterparties with large changes in their contribution to contemporary capital, and try to understand the underlying drivers. He said he'd look into that and see if some simple extracts from their single help.

2. Background descriptive data on margin status & arrangements.

→ This thought pretty together - one one-off, but the following kinds of data might be possible: (i) proportion of counterparties with aim and positive initial margin (also two way, vs. one-way?); (ii) periodicity of variation margining.

3. Background data on APFs - data on trade counts and perhaps some exposure-based metrics.

→ This should be possible and they will provide.

4. Related notes (outside the PE framework).

Quarterly, or as needed, update on revisions to margin parameters [discussing on the analytical aspects and your group's work].

→ Top of one week call. Also, John Daniels said he had to do this morning as a discussion regarding whether to use initial margin to BV or commodities trades (given the general view in volatilities of most counterparties). Perhaps can follow up with some details, notes, etc.

5. Pre-trade PE analysis - synopsis of any notable one-trial last quarter [if relevant - it seemed you did not spend much time on this].

[Helms generally, when in the analysis group typically considered - for what types of trades, counterparty, trade size?]

→ By period, Greg does not seem to do much work. The bottom line is one analysis. The bottom line is one analysis.

6. Include review/signature of hand-crafted, static parameters in quarterly PE discussion.

→ Such updates are rare. On ad hoc basis, will be so know.

David email to Greg re: Annex PE report & reply discussion

Hi Greg, hope things are going well. Wanted to follow up on the PE from Friday. I'm wondering when should expect the next report - we seem to have got off quarterly schedule. Second, we had some calls a few weeks ago regarding possible possible extensions to the PE report and related matters. I've mentioned the key items below (as per our notes - which I've summarized something). When convenient, perhaps we could talk about how to flesh them out a bit and look at possible time-frames for incorporating those elements. Obviously, much of this is experimental, we can start small, and fine-tune as we go along.

1. Narrative, explanation of counterparty that have experienced large PE changes in terms, relating those PE changes to market moves.

I believe you had said you could include data on risk factors that have shown significant moves; narrative aspects would be handled by Finance group.

2. Background descriptive data on margin status & arrangements.

3. Background data on APFs - data on trade counts and perhaps some exposure-based metrics.

4. Related notes (outside the PE framework).

Quarterly, or as needed, update on revisions to margin parameters [discussing on the analytical aspects and your group's work].

→ Top of one week call. Also, John Daniels said he had to do this morning as a discussion regarding whether to use initial margin to BV or commodities trades (given the general view in volatilities of most counterparties). Perhaps can follow up with some details, notes, etc.

6. Include review/signature of hand-crafted, static parameters in quarterly PE discussion.

**#8 Call with Greg, Philip & Tim: updated Equities PE, 04/01/00**

\* Purpose of call was to go over their Impact Analysis & methodology related questions Ed asks.

**I. Impact Analysis**

Philip that some affiliates? but this discussion.

\* Now there appear to have been some other methodology issues as well [e.g., not settlement prices etc.] Check with Greg what those are.

\* They still stand on their convictions. Highlight of impacts due to methodology changes:  
Total Equity Dividends CPE (Unlevered Potential Exposure, assumed over all consumption) declines by about 10% (32%).  
Investment Capital from Equity Dividends falls by 22% relative to 27% (not 37%) of P&E.  
[CHECK WHETHER THESE ARE REG-CAP or assumed Cqg NOS. FOOTNOTES: 1 ON P13 OF "BLOWUP REPORT" SUGGESTS THESE NUMBERS MIGHT BE AT THE 91% (MR) RATHER THAN 87% LEVEL.]

\* They also studied the impacts in other ways – larger impacts, impacts on ‘top’ consumption, etc.  
Main consumption expenditures decline as P/E constant with expectations. Also experienced increases – those were researched and explained.  
Consumers with biggest impacts tended to be those with concentrated in particular trade types which are most affected by the switch (over swaps and equity swaps) e.g., pension funds

\* Settlement Rates are now properly captured – GET A SENSE OF MAGNITUDE & RIE IF THIS NEEDS TO BE UNDERSTOOD FURTHER. The 2-week move is now rolled and is a ‘new’ 2-week move (CHECK what was done before). Perhaps all settlements were assumed to be at end of 2 weeks?

\* For consumption to which Ed has drawn attention e.g., other dividend, there were effects arising, e.g., from equity swaps. There was a known treatment necessary which led to an overstatement of exposure (at future time dates, cash flows that should already have occurred) and hence would not affect value at the time dates (was not being included – CHECK). I.e., aging was not handled correctly.

\* ‘True’ (assumed) APIS declined from 5.6% to 5.9% (of trade count, expected)  
\* Equity swaps and variance swaps accounted for 40% of modified trades (dividends): made cover or 3 exposure  
\* Previous model: variance of variance, along each path, was not being captured – hence potential understatement of exposure on variance swaps.

\* Dispersion makes need to be APPEF because certain risk factors were lacking, but are now being processed [RETABLE]  
\* Changes in loan valuations (receptions) attributable to death changes: 45 new loans rejections; 90 dropped off.

1. Risk factor paths are built up from daily shocks; i.e., discretization Delta  $t \leq 1$  day. But revaluations are carried out at only a small subset of dates?  
Ans: Yes. Moving to daily rates has been a huge IT challenge – huge files, CPU consumption...

2. Equity indices are constructed as the sum of individual equities that using constant, time-invariant weights – Eq. 13 p.77; whereas real-world equity indices are often value-weighted. Any analysis of the potential impact of this?  
No. However, the correlated risks will be weighed on index volatility.

3. R, up or R, down (p. 6) – are any additional checks carried out to see if the return data are actually ‘valid’ (even if they exceed R, up or R, down)? checked off ‘valid’  
‘In using the time-series data, if any positive 1-day return is greater than R, 1p or the magnitude of any negative return is greater than R, down, that return is set to 0’  
No, check data

4. Do there exist guidelines to establish historical data? – e.g., if part is deemed not representative of future.  
No

5. Why not date picks equally weighted, rather than targeted?  
Because EGARCH tends to weight recent data more heavily anyway.

6. Page 7: would it be desirable to rebalance the date pick set occasionally?  
This is done – not well as it should be.

7. Isn't  $N_p$  necessarily less than or equal to  $N_d$ ?  
Intense, in bootstrapping to the data that the given being in the parent distribution rather than just a sample. Thus, equated draws from the parent is still presumed to give an lid sample.

8. Is the history in segments rebalanced each day?  
Yes. In fact, DIA has required that they do the estimations every day and ensure a ‘convergence’ (large sample) limit

9. Would it not be the case that the conditional variance estimated via a GARCH model is likely to lag IV – because IV reflects market anticipations, whereas GARCH depends on realized checks, should be more effective.  
No. Market risk uses parametric variance. CERFA uses the CER data.

10. IV surface – same points as used by market risk?  
No. Market risk uses parametric variance. CERFA uses the CER data.

11. Eq. 14. In IV surface simulation, all same, unlike path gets the same shock. Bit of a departure from observed empirics. Discussion of choice & potential impact.  
Agree. In fact, maybe for long-dated variance swaps is too large, because of this. Also did some PCA analysis – the FC (likely) is dominant.

12. Serial correlation is possible in returns of low-cap stocks.  
They were not aware of this.

13. Obj. 17.7, argues, if the average over all times CER over all paths, (indexed by p)?  
It is an average over both paths and time series.

14.  $X_t$  is introduced as a historical data index, but is also used to denote a parameter (p. 10, eq. 7)  
No.

15. Discuss approach taken for simulating the IV of indices. Cases EGARCH cannot be applied since the index return is derived from underlying names, rather than as an independent return?  
Yes.

16. Sample empirical estimates of the relation between the 3M ATM vol and realized vol would be helpful.  
Will need

17. Page 35 & 36 seem to be contradictory estimates.  
Mistake: will need updated version.

**#9 Q and A for Greg on PE Equities**  
**Re: Greg, an overview of questions on Equities PE doc, for discussion, contribution and clarification.**  
1. Risk factor paths are built up from daily shocks; i.e., discretization Delta  $t \leq 1$  day. But revaluations are carried out at only a small subset of dates?  
2. Equity indices are constructed as the sum of individual equities that using constant, time-invariant weights – Eq. 13 p.77; whereas real-world equity indices are often value-weighted. Any analysis of the potential impact of this?  
3. R, up or R, down (p. 6) – are any additional checks carried out to see if the return data are actually ‘valid’ (even if they exceed R, up or R, down)? checked off ‘valid’  
‘In using the time-series data, if any positive 1-day return is greater than R, 1p or the magnitude of any negative return is greater than R, down, that return is set to 0’  
4. Do there exist guidelines to establish historical data? – e.g., if part is deemed not representative of future.  
5. Why not date picks equally weighted, rather than targeted?  
6. Page 7: would it be desirable to rebalance the date pick set occasionally?  
7. Isn't  $N_p$  necessarily less than or equal to  $N_d$ ?  
8. Is the history in segments rebalanced each day?  
9. Would it not be the case that the conditional variance estimated via a GARCH model is likely to lag IV – because IV reflects market anticipations, whereas GARCH depends on realized checks.  
10. IV surface – same points as used by market risk?  
11. Eq. 14. In IV surface simulation, all same, unlike path gets the same shock. Bit of a departure from observed empirics. Discussion of choice & potential impact.  
12. Serial correlation is possible in returns of low-cap stocks.  
13. Obj. 17.7, argues, if the average over all times CER over all paths, (indexed by p)?  
14.  $X_t$  is introduced as a historical data index, but is also used to denote a parameter (p. 10, eq. 7)  
15. Discuss approach taken for simulating the IV of indices. Cases EGARCH cannot be applied since the index return is derived from underlying names, rather than as an independent return?  
16. Sample empirical estimates of the relation between the 3M ATM vol and realized vol would be helpful.  
17. Page 35 & 36 seem to be contradictory estimates.  
CERFA  
\* Of course, comparing sites to realizations is inherently difficult because sites are ‘risk-neutral’ – CHECK THEIR BACKTESTING DOC.

**#10 Notes from call with Greg, Luc (5/1/00)**

1. Equity model will need to be updated: necessary, study to get into production by Mar end. Comparison with previous model. Previous model used to bootstrapping returns and vol surface. New, estimate an EGARCH process to estimate (and thus incorporate into sites) time-variant in variance, and by persistence along a time path. Note: the “probable” component of variance is generated from the estimated EGARCH while the random component is obtained by bootstrapping from the history of individual returns to the EGARCH model.

–> clarify: think CERFA, the unconditional distribution is not normal (though the conditional is) by approximately. implied vol is usually interpreted as a BS sense – i.e., normal return. So how we “square” data w/ a normal distribution of sites vs IV that has that?  
–> Public up on observed impacts. Check at other times

**Re: Model Variations**  
\* done by Bruce and Claude Dettwiler; incorporated additional regular notes – will need to update docs for both sites.  
\* ‘RR’ models: fully adjusted (prices and yields)  
\* ‘RR’ model – site and CER prices approx.; the tranche price (an approximation) is to be approx directly. Previously, the tranche price used a completed correlation, now uses the base correlation (contingent impact) on vol-to-risk.

\* AFC: independent volatilities are required.  
\* New backtesting of CDS, Swaps, Equities, FX. Limited limitation in production environment, so building prototype models etc. etc. is not  
-> Why investing so much resources into this. Because of the Risk Measurement committee?  
\* Realized vs. CER, working well  
-> how done?

**Re: Misc: RP stress test – For Claude Dettwiler (CD), Long Short (LSD) stress test now implemented and in testing mode.**  
**Re: Regulator reform**  
\* Formal: Will work on setting up CD (possibly some considerable work with new). May include underlying data in model or other format  
\* Parameters (regulator site model) – Greg thought they would be hard to interpret. This is true for complex things such as the RR model, but for simpler processes, one should be straightforward. Will follow up.  
\* Necessary: explanation of comparisons that have experienced large PE changes in sites, starting from PE changes in market moves. Thought this might be feasible. Should IR group would be doing it. Greg will talk to them.

\* Will include some data on risk factors that have shown significant moves.  
\* Background data on complete return at all frequencies. Get call require  
\* Background data on APIS – will get up when we can track could: some exposure figures)

\* Related risks outside the PE framework  
\* Agreed to do a quarterly or so model update on scenarios in energy parameters, PE analysis for once-off structured notes (but be likely spend much time on this.)

**Taxuff note to Greg, 07/08**

Mainly, we want to talk about possible future enhancements to the PE model.  
\* Formal – hard copy vs. electronic. If hard copy, how to streamline and add comments. Not.

\* As you know, a basic indicator we look to in the “implementation” of the PE components (in particular, the simulations) in market moves. We can approach that in several ways:  
(i) track key parameters (inputs to simulation models) – compare through time. Also highlighting those risk factors which have experienced significant moves.  
(ii) Identify trends (hypothetical active flow) and/or consumption which have experienced large PE changes (for other than just passive changes) and attempt to relate to site, news and ultimately to market moves.

- (ii) Conversely, for risk factors known to have experienced large moves, are there corresponding visible signals on the rates and FX (again, hypothetical or live trades/contingencies)?
- \* Additional hypothetical data, e.g.:
- (i) margin rates & arrangements (number of counterparties under different types of margin schemes, respective frequency of periodic margin/relative exposure amounts) that looking for bid/ask signals, not required for quarterly report.
- (ii) Non-collateral trades—risk types, exposure concentrations, concentration among critical counterparties.

We also thought it may help to get some data on an ongoing basis, for some of the other PE-related activities you engage which are outside the core PE framework, e.g.:

- (i) Updating of margins, hedges, etc. in response to market moves
- (ii) Constructed FX risks for structured, complex, trades.

As always, there are just possibilities we'd like to explore. We want to make that fine balance between feasibility, cost and usefulness (to you and us)?

Thanks again. Talk to you soon.

HP analytics with Greg & C. Tim, July 10.

\* Implications of fund strategy for design of analytics: Standard risk measures work best for static strategies—those the portfolio, etc. If a fund follows a dynamic strategy, this becomes less useful. But did not really speak to how many funds might follow dynamic, how many static, etc.: Also, cannot really tell from inspection of portfolio at a point in time whether a firm intends to follow a dynamic or static strategy.

\* Allowed an example such that for a dynamic strategy, a sizable loss resulted from accumulated smallish moves (Presumably, however, a jump would affect average damage too).

\* Notes on capital depends on leverage margin terms.

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\* Based on CDS, 4000 counterparties, they provided a breakdown by strategy (not exposed, only half had reported a strategy, but these were the biggest ones) Equity Long Short is the most common (39%). Other labels could subsume a lot of diverse strategies. believe gov's proportions are similar to that of the broader universe.

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Scenario Builder Platform

\* Both primarily risk-taxes analysis of general counterparties, but also used for IFRs.

\* First type consists of several "classes" of pre-determined stress tests. (Who fashioned these scenarios? Happen? Fitch Market Risk?) daily on every counterparty. These are not viewed as useful at all. Because the current version are (i) outcomes are "too extreme/unlikely", (ii) not "granular enough"—e.g., updates check is applied at the index level, not at individual stocks; (iii) not customizable.

\* To overcome some of these problems, created the scenario builder. Has allows the user to interactively build, save, edit scenarios. Certain limitations exist—e.g., cannot apply arbitrary yield curve deformation (twist, etc.)

This is most useful, e.g., to explore the impact of some type of market event—e.g., you appreciate...

Expected to be used occasionally (rather than regularly).

\* By probability for energy, FX, equities, energy and metals, credit distribution is being tested.

\* That conversation would be subject more development to be done in equities (e.g. pair to individual names as risk factors)

>> Can you comment to me the risk factors that can be perturbed and the types of perturbations that can be applied?

\* Existence of risk factors is introduced every night?

<<<<<<<<<<

IBMR

IBMR actually includes 3 different tools: (i) VaR-based margining model (implemented and in use) (ii) Algorithmic stress tests—in process, testing for credit derivatives, equities will be next; (iii) automatic scenario generation—more events, only prototype at present. production possibly next year.

\* VaR-based margining: IBMRs with VaR-based (pre- or post- or intra) approach was a VCA's.

Algorithmic stress test: The stressor, while not user-specified, have high or conditional—e.g., the shock applied may depend on the level of a name's CDS spread. Testing credit distribution at present, equity derivatives next.

These stresses were developed in DPE and are used there for margining. Today's discussion concerned in use for risk evaluation. (part in the hot here, discuss needed).

Automatic scenario generation: scenario that are purely empirical and partly judgmental. (i.e., shock magnitudes would have some probabilistic interpretation (e.g., 6sd moves), but would be compatible with a plausible economic story.

>> Discuss the example.

—on occasionally on the IFRs, viewed as a tool that will be used occasionally, at the bank rather than a workhorse.

Long-term risk models—use these counterparty names (underlines) for each strategy? cannot drill each information at present.

#9 Sent to Greg 10/07/10

Hi Greg, thanks for the heads up. We've recently had conversations (and will continue to) with the PSA on FX valuation and we've sent them the same paper, or they are aware of our approach, in broad terms. We have no objection to your sending the quarterly report to them. To the extent it reduces the burden on the firm by avoiding duplication of effort, that is a very desirable outcome. However, a few provisions and qualifiers:

- 1. The report is not ending and because we need the data we have some general questions on the data collection and content and we would like to say risk that regularly.
- 2. The PSA may have differing needs or views on the content or format of the report. While constructive and reasonable communication/coordination could be accommodated, we would want to do that on a case-by-case basis, with the consideration of the merits of those proposals. We'd appreciate your keeping us posted on developments.

Thanks











\*\*\*\*\*  
1. Revised findings related to the Risk Management Framework (RMF) process.  
2. Revised findings related to the Risk Management Framework (RMF) process.  
3. Revised findings related to the Risk Management Framework (RMF) process.

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**From:** P.C. Venkatesh

**Subject:** Comments on “Merrill Lynch’s An Introduction to the Potential Credit Exposure Model” (December 2004)

**Date:** 12/10/2004

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Comments based on “An Introduction to the Potential Credit Exposure Model” doc dated December 2004.

## 1 Re: “Section 2.2: A Simple Illustrative Example”

Consider two instruments dependent on  $N$  underlyings,  $S_1, S_2, \dots, S_N$ . Denote instrument values by  $V_1, V_2$ , or more explicitly as functions of the underlyings:  $V_1(S_1, \dots, S_N)$ , and,  $V_2(S_1, \dots, S_N)$ .

Likewise, changes in instrument values are given by  $\Delta V_1, \Delta V_2$ , or more explicitly as:  $\Delta V_1(S_1, \dots, S_N)$ , and,  $\Delta V_2$

Portfolio value and changes are given as:  $V_p = V_1 + V_2$  and  $\Delta V_p = \Delta V_1 + \Delta V_2$

### Assumption 1: Normal—Risk Factor

Assume that the underlyings are generated by  $K$  common “risk factors”  $f_1, f_2, \dots, f_K$  (usually,  $N \gg K$ ). Assume that the risk factors are each standard Normal, and mutually independent (i.e., identity correlation matrix). *However, the underlyings are dependent/correlated, and hence, so are  $\Delta V_1$  and  $\Delta V_2$ .*

Under the Normal-Factor assumptions, each underlying can be written as, e.g.,:  $S_i = \beta_{i1}f_1 + \beta_{i2}f_2 + \dots + \beta_{iK}f_K$ , and likewise,  $\Delta S_i = \beta_{i1}\Delta f_1 + \beta_{i2}\Delta f_2 + \dots + \beta_{iK}\Delta f_K$ . Correlation between  $S_i$  and  $S_j$  arises through the product terms  $\beta_{im}\beta_{jm}$  for  $m = 1, 2, \dots, K$ .

Also note that, under the assumption of multivariate normality, correlation completely describes the dependence among the random variables.

### Assumption 2: Linear instruments

It is assumed that the instruments are *linear* functions of the underlyings. This implies that  $\Delta V_i$  can be written as, e.g.,:  $\Delta V_1 = \alpha_{11}S_1 + \alpha_{12}S_2 + \dots$ . For the factor-representation, first let

$\sigma_{\Delta V_i}^2 = \text{variance of } \Delta V_i$ ,<sup>1</sup> and then write:

$$\begin{aligned}\Delta V_1 &= \sigma_{\Delta V_1} (w_{11}\Delta f_1 + w_{12}\Delta f_2 + \dots + w_{1K}\Delta f_K) \\ \Delta V_2 &= \sigma_{\Delta V_2} (w_{21}\Delta f_1 + w_{22}\Delta f_2 + \dots + w_{2K}\Delta f_K)\end{aligned}\tag{1}$$

To elaborate a bit, note that

$$\begin{aligned}\text{Variance}(\Delta V_1) &= \sigma_{\Delta V_1}^2 \left[ w_{11}^2 \sigma_{\Delta f_1}^2 + w_{12}^2 \sigma_{\Delta f_2}^2 + \dots + w_{1K}^2 \sigma_{\Delta f_K}^2 + 2\text{cov}(\Delta f_1, \Delta f_2) + \dots + 2\text{cov}(\Delta f_1, \Delta f_K) \right] \\ &= \sigma_{\Delta V_1}^2 \left[ w_{11}^2 + w_{12}^2 + \dots + w_{1K}^2 \right]\end{aligned}$$

since  $\text{Variance}(\Delta f_j) = 1$  and  $\text{cov}(\Delta f_j, \Delta f_k) = 0 \forall j, k (j \neq k)$ . Thus, the  $w_{ij}$ 's are defined such that  $\sum_{j=1}^K w_{ij}^2 = 1$

## 1.1 Results and Expressions

The objective is to compute peak potential credit exposure of the portfolio. *Assuming the trades are nettable*, we can work with the “usual” portfolio formulas.<sup>2</sup> That is, for any joint realizations of the underliers, first calculate portfolio value as being the simple sum of the constituent trades (which is the equivalent of all trades being mutually nettable); locate the extreme positive value of the portfolio and treat that as the estimated PCE. If all the assumptions are met, this can be a simple very calculation relative to the simulation approach.

### 1.1.1 PCE in the space of the “underlyings”

Knowing the correlation structure (matrix) among  $S_i$ , we can work out the corresponding correlation between  $\Delta V_1$  and  $\Delta V_2$ .<sup>3</sup>

Portfolio value, and change thereof, are, respectively,  $V_p = V_1 + V_2$ ,  $\Delta V_p = \Delta V_1 + \Delta V_2$ . Letting  $\text{Variance}(\Delta V_i) = \sigma_{\Delta V_i}^2$ ,  $\text{Variance}(\Delta V_p) = \sigma_p^2$  is given by

$$\sigma_p^2 = \sigma_{\Delta V_1}^2 + \sigma_{\Delta V_2}^2 + 2\text{cov}(\Delta V_1, \Delta V_2) = \sigma_{\Delta V_1}^2 + \sigma_{\Delta V_2}^2 + 2\sigma_{\Delta V_1} \sigma_{\Delta V_2} \rho_{\Delta V_1 \Delta V_2}.\tag{2}$$

<sup>1</sup>To avoid cumbersome notation, I omit the “time-scaling” that should be present in the variance terms; just assume that all the variances are scaled to the appropriate time horizons.

<sup>2</sup>If they are not nettable, the approach described here is not usable. Furthermore, in a non-simulation approach, aggregation of PCE across nettable blocks is not straightforward.

<sup>3</sup>To illustrate, suppose  $V_1 = \alpha_{11}S_1$  and  $V_2 = \alpha_{22}S_2$ —i.e., each instrument depends on only one underlying. Then  $\text{cov}(\Delta V_1, \Delta V_2) = \alpha_{11}\alpha_{22} \text{cov}(\Delta S_1, \Delta S_2)$ .

The 99th percentile value of  $\Delta V_p$  (implicitly at a date  $\Delta t$  into the future) can be written as  $\Delta V_p^* = \mu + 2.33\sigma_{\Delta V_p}$ <sup>4</sup>. Dropping the  $\mu$ , we get the expression in the document:

$$\begin{aligned} PCE(t) &= \max [V_{10} + V_{20} + 2.33\sigma_p, 0] \\ &= \max \left[ V_{10} + V_{20} + 2.33\sqrt{\sigma_{\Delta V_1}^2 + \sigma_{\Delta V_2}^2 + 2\sigma_{\Delta V_1}\sigma_{\Delta V_2}\rho_{\Delta V_1\Delta V_2}}, 0 \right] \end{aligned} \quad (3)$$

### 1.1.2 PCE in the factor space

To express equation 3 in factor space, we only have to write  $\sigma_p$  in terms of the factors. Working through the substitutions (from the expressions for  $\Delta V_i$  in equation 1) :

$$\begin{aligned} \sigma_p^2 &= \text{Variance}(\Delta V_p) = \text{Variance}(\Delta V_1 + \Delta V_2) \\ &= \text{Variance} \left[ \sigma_{\Delta V_1} (w_{11}\Delta f_1 + w_{12}\Delta f_2 + \dots + w_{1K}\Delta f_K) + \sigma_{\Delta V_2} (w_{21}\Delta f_1 + w_{22}\Delta f_2 + \dots + w_{2K}\Delta f_K) \right] \\ &= \text{Variance} \left[ \Delta f_1(\sigma_{\Delta V_1} w_{11} + \sigma_{\Delta V_2} w_{21}) + \Delta f_2(\sigma_{\Delta V_1} w_{12} + \sigma_{\Delta V_2} w_{22}) + \dots + \Delta f_K(\sigma_{\Delta V_1} w_{1K} + \sigma_{\Delta V_2} w_{2K}) \right] \\ &= (\sigma_{\Delta V_1} w_{11} + \sigma_{\Delta V_2} w_{21})^2 \sigma_{\Delta f_1}^2 + (\sigma_{\Delta V_1} w_{12} + \sigma_{\Delta V_2} w_{22})^2 \sigma_{\Delta f_2}^2 + \dots + (\sigma_{\Delta V_1} w_{1K} + \sigma_{\Delta V_2} w_{2K})^2 \sigma_{\Delta f_K}^2 + \\ &\quad 2\text{cov}(\Delta f_1, \Delta f_2)(\sigma_{\Delta V_1} w_{11} + \sigma_{\Delta V_2} w_{21})(\sigma_{\Delta V_1} w_{12} + \sigma_{\Delta V_2} w_{22}) + \dots \end{aligned}$$

But  $\sigma_{\Delta f_j}^2 = 1$  and  $\text{cov}(\Delta f_j, \Delta f_k) = 0 \forall j, k (j \neq k)$ , yielding

$$\sigma_p^2 = (\sigma_{\Delta V_1} w_{11} + \sigma_{\Delta V_2} w_{21})^2 + (\sigma_{\Delta V_1} w_{12} + \sigma_{\Delta V_2} w_{22})^2 + \dots \quad (4)$$

### 1.1.3 Equivalence between the representations

To show the equivalence to equation 2, consider a 2-factor case,  $K = 2$ . Expanding the squares in equation 4,

$$\sigma_p^2 = \sigma_{\Delta V_1}^2 (w_{11}^2 + w_{12}^2) + \sigma_{\Delta V_2}^2 (w_{21}^2 + w_{22}^2) + 2\sigma_{\Delta V_1}\sigma_{\Delta V_2}(w_{11}w_{21} + w_{12}w_{22})$$

Since  $(w_{11}^2 + w_{12}^2)^2 = (w_{21}^2 + w_{22}^2)^2 = 1$ , this reduces to

$$\sigma_p^2 = \sigma_{\Delta V_1}^2 + \sigma_{\Delta V_2}^2 + 2\sigma_{\Delta V_1}\sigma_{\Delta V_2}(w_{11}w_{21} + w_{12}w_{22})$$

Comparing this to equation 2, equivalence is obtained if  $\text{cov}(\Delta V_1, \Delta V_2) = \sigma_{\Delta V_1}\sigma_{\Delta V_2}(w_{11}w_{21} + w_{12}w_{22})$

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<sup>4</sup>It seems like  $\mu$  (the expected change) is assumed to equal zero— a questionable assumption for some series (e.g., equities) for long enough  $\Delta t$ .

Again, straightforward substitution and algebra shows this is the case:

$$\begin{aligned}\text{cov}(\Delta V_1, \Delta V_2) &= \text{cov} \left[ \sigma_{\Delta V_1} w_{11} \Delta f_1 + \sigma_{\Delta V_1} w_{12} \Delta f_2, \sigma_{\Delta V_2} w_{21} \Delta f_1 + \sigma_{\Delta V_2} w_{22} \Delta f_2 \right] \\ &= \text{cov} \left[ \sigma_{\Delta V_1} w_{11} \Delta f_1, \sigma_{\Delta V_2} w_{21} \Delta f_1 \right] + \text{cov} \left[ \sigma_{\Delta V_1} w_{12} \Delta f_2, \sigma_{\Delta V_2} w_{22} \Delta f_2 \right] \\ &= \sigma_{\Delta V_1} \sigma_{\Delta V_2} w_{11} w_{21} + \sigma_{\Delta V_1} \sigma_{\Delta V_2} w_{12} w_{22} \\ &= \sigma_{\Delta V_1} \sigma_{\Delta V_2} (w_{11} w_{21} + w_{12} w_{22})\end{aligned}$$

## 1.2 Re: “2.3 The PCE Model”

More on this later



**Validation of Potential Exposure Methodologies at the CSE Firms**

by

**Steve Spurry, P.C. Venkatesh \***

**This Draft: February 26, 2007**

**Preliminary**

**Please do not circulate without authors' permission**

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\* Securities and Exchange Commission, 450 5th St., N.W., Washington, DC 20549.

(202)-551-5549; fax: (202)-772-9273.

Internet: [sspurry@sec.gov](mailto:sspurry@sec.gov); [venkateshp@sec.gov](mailto:venkateshp@sec.gov)

Thanks to Matt Eichner and Mike Hsu for their valuable comments. The opinions and views expressed herein are the authors' and do not necessarily reflect those of the Commission or its staff.

# 1 Executive Summary

Firms subject to CSE<sup>1</sup>-supervision by the SEC incur substantial **counterparty credit risk** in the course of their normal operations. Measuring these risks requires specially-designed, dedicated methodologies and systems—usually referred to collectively as Potential Exposure or **PE-systems**. The outputs from these systems are key inputs to several important downstream applications—in particular, measurement and governance of counterparty credit risk, and computation of regulatory (and, possibly internal risk or economic) capital. This paper outlines our approach to assuring ourselves that, at the CSE firms, the PE-methodologies are sound and their outputs are reliable and of good quality. Developing a coherent validation strategy is especially important for us, since the CSE-firms are among the earliest adopters of the Basel II standards (which permits the use of *expected potential exposure* for calculating regulatory capital).

In brief, our approach has three components. One, quarterly reports submitted by the firms that allow us to evaluate, on an ongoing basis, the empirical performance of a firm’s PE methodology and the robustness of its internal validation program. Two, reviews by OPSRA<sup>2</sup> staff of the analytical and technical components of the firms’ methodologies. Third, as part of ongoing supervision, we review the processes and infrastructure supporting the exposure calculations and keep abreast of all other developments that potentially affect the exposure calculations or systems.

This paper focusses primarily on the first component, namely the quarterly report. In developing the form and content of this report, we have worked closely with the firms, building on, to the extent possible, metrics and analyses already being employed by the firms. The collaborative approach to designing the report mirrors our general philosophy to not be prescriptive but allow the firms to propose the specifics that are consistent with our general principles and their internal processes. It emphasizes measures and indicators that are intuitive, easy to interpret and provide timely signals of possible developing flaws. Notably, statistical backtests, whose shortcomings (well documented in the case of daily Value-at-Risk) are particularly acute in the PE-context, do not figure prominently. The data in the report, when reviewed against the backdrop of market events and moves in risk factors over the previous quarter, will help to

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<sup>1</sup>Consolidated Supervised Entity.

<sup>2</sup>Office of Prudential Supervision and Risk Analysis.

highlight *prima facie* “unexpected” behaviors which may be indicative of potential flaws in the PE-methodology.<sup>3</sup> Thus, the report will provide a concrete basis for a focussed, ongoing dialogue on the empirical performance of a firm’s PE methodology and the quality of the firm’s internal validation tools.

Section 2 provides some general background and context, including basic definitions, which may be helpful to readers less familiar with this subject. Section 3 explains the role of the analytical components in generating PE values, the compromises often made in typical implementations and the resulting impact (errors and inaccuracies) on PE values. Common types and sources of potential mismeasurement errors are surveyed in Section 4. Section 5 describes the contents of a typical quarterly report and explains how these measures assist in ongoing validation of the PE methodology—both internally at the firms and for our assessment of the firms’ validation program. Section 6 briefly describes the nature of OPSRA reviews of firms’ methodologies.

## 2 Background: Counterparty Risk, Potential Exposure, etc.

In the course of their trading and market-making activities, CSE-firms enter into bilateral trades with a broad range of *counterparties*.<sup>4</sup> Principal trade types include over-the-counter (OTC) derivatives, and securities financing transactions. Typically, the contractual payoffs are directly linked to levels of observable risk factors (e.g., equity prices or interest rates) causing the mark-to-market (MTM) value of these contracts to fluctuate in response.<sup>5</sup>

Consider the case in which a financial institution (FI) has a single trade with a counterparty. If the counterparty defaults, the FI suffers a loss if the trade has a *positive* MTM value (from the FI’s standpoint) at the time of default; a *negative* (from the FI’s standpoint) trade value means

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<sup>3</sup>For example, the report includes intra- and end-of-quarter views of two (intermediate) outputs of the PE-system: (i) projected future distributions of major risk factors (e.g., swap rates, FX rates, crude oil prices), and (ii) CE’s and PE’s of generic trades (swaps, FX options, oil forward contracts). One would normally expect these quantities to be responsive to the underlying market drivers—e.g., a sharp market move in the forward curve for crude oil prices should (generally speaking) have some impact on the projected distributions of oil prices and PE’s of oil forwards.

<sup>4</sup>Counterparty types include other financial institutions, corporate clients, hedge funds, sovereigns, local governments, and clearing houses.

<sup>5</sup>Changes in MTM’s may also result from changes in unobservable factors, such as liquidity- or risk-premiums.

that the FI owes the defaulting counterparty. For a single trade, therefore, only positive trade values contribute to credit exposure; negative trade values contribute zero credit exposure.

If the defaulting counterparty has a portfolio of trades with the FI, the loss or exposure (incurred by the FI) on the default date depends on the extent to which “winning” trades (those with positive MTM) are allowed to offset against losing trades (those with negative MTM). These are governed by **netting** rules, which are legal constructs.

The amount the FI would lose (prior to any recovery) if the counterparty were to default today is called the *current exposure* (**CE**). But, of course, a counterparty may default at *any future* date during the contractual life of the current (“today’s”) portfolio of trades—this gives rise to a *potential future exposure* (**PE**). The amount the FI would lose at future default date would depend on the actual MTM realized at that future default date. From today’s vantage point, the MTM that might prevail at that future date is not a known, single, number, but is rather best described by a range or probability distribution of possible values. That is, the PE for a future default date is, unlike the CE, not a single number, but characterized as a probability distribution of possible values. This distribution is tightly linked with the possible outcomes of the market variables, or risk factors, driving the market values of the component trades. The distribution of exposures at each such possible future default date is generally different, because of differences in the distributions of the underlying risk factors and in the “age” of the portfolio (i.e., some trades may have matured; remaining maturities would be different). A basic purpose of **Potential Exposure (PE)-methodologies** is to generate quantitative estimates of these exposure-distributions.

### Exposure measures

In their totality, the exposure-distributions constitute a vast amount of data. Accordingly, several summary measures are used to compactly characterize them. Note that CE just depends the current MTM of the portfolio (with applicable netting), and is therefore independent of the PE-methodology. Common summary measures of **PE** include: (i) a time-profile of a relatively extreme quantile from distributions at future dates; (ii) the single largest such quantile within the time profile (*Peak PE*); (iii) an extreme quantile exposure at the 2 weeks hence; (iv) a time-profile of the expected exposures at future dates; (v) the time-average of such expected exposures over the first year. It is worth emphasizing that all of these quantities are “estimates” or “forecasts”

made based on *current* data—the current portfolio, the current values of the driving risk factors, and so on.<sup>6</sup> As we progress in calendar time, these variables change and the estimated exposures are updated as well. For example, the exposure distribution computed tomorrow will differ from today’s as existing trades age, new trades are added and market factors evolve.

It may also be helpful to view the PE-measures as being equal to the CE plus an “add-on.” For reasons detailed later, it is preferable to compute this “add-on” in a reasonably rigorous fashion, using simulation. However, somewhat *ad hoc*, rule-of-thumb specifications are also occasionally used, in particular for dealing with complex or novel trades.<sup>7</sup>

#### Risk mitigants and reported exposure

FI’s may use various types of risk-mitigants to reduce the actual exposure faced. These include, for example, margining and collateral agreements (e.g., initial margin plus daily variation margining), third-party guarantees, termination/amendment rights, credit derivatives, etc.<sup>8</sup> Some of these risk-reducing effects are explicitly recognized in reported exposure, while others are not. For instance, where margining agreements are in place, exposures are often reported *net* of margin. As a result, reported exposures may differ from the exposure calculated by the PE-system and from pre-margin exposures. It is difficult to generalize because margining practices and reporting conventions<sup>9</sup> vary widely—across firms and, even within a firm, across counterparties and trade-types. One has to be cognizant of these complications when comparing reported CE’s and PE’s, and in evaluating validation schemes of PE-methodologies.

In general, the risk-mitigants do not completely eliminate counterparty credit exposure. For example, even under a daily margining scheme with zero threshold in effect, the effective period of risk, from date of counterparty default, is usually assumed to be two weeks (ten business days)—over that period, the counterparty would either make good on a margin call, or else the FI will liquidate the portfolio at the MTM prevailing two weeks later.<sup>10</sup> Thus, at each possible future

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<sup>6</sup>As noted in the previous paragraph, these forecasts are made for multiple horizons, covering the “maturity” of the portfolio.

<sup>7</sup>If trade counts rise, the incentive grows to move to a rigorous specification as the *ad hoc* rules are generally conservative and tend to overstate economic exposure.

<sup>8</sup>Discussion of these schemes is outside the scope of this document.

<sup>9</sup>I.e., the exact treatment of risk-mitigants for reporting purposes.

<sup>10</sup>The risk of course is that during that two-week period the amount owed the FI could have increased. This

date of counterparty default, the effective period of risk is the two weeks following that date. Incorporating this “dynamic” mechanism into the PE-methodology poses some implementation difficulties, which we point out later.

### Uses of exposure measures

Exposures and other outputs computed by PE-systems are used by several downstream applications. They are used in credit risk measurement and governance—e.g., comparison against counterparty credit limit. They are used as inputs to computation of regulatory and economic capital measures. The PE-systems could also be used, in principle, to estimate required upfront or initial margin. Actual implementation practices however suggest that its usage for this purpose tends to be limited.

## 3 Design & Implementation of the PE Methodology

In brief, the PE-system seeks to estimate the counterparty exposure generated by *today’s* portfolio over the life of that portfolio. As a practical matter, one takes snapshots of the exposure at a relatively few representative dates (“horizons” or snapshot dates), rather than at each single time-point. Conceptually, for each horizon, the PE calculation consists of the following steps: (i) generating possible future risk factor scenarios (“states of the world”) for that horizon; (ii) re-pricing each trade in each future state (at that horizon); (iii) calculating portfolio-exposure in each future state, subject to netting and aggregation rules; and (iv) sorting the computed exposures across states to yield an exposure-distribution, from which summary statistics are extracted. These steps are repeated for the target set of horizon dates.<sup>11</sup> Table 1 sketches this sequence of computations.

There are several key design and implementation choices with respect to steps (i) and (ii),

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also emphasizes that what matters is the *replacement* cost of the contract. That is, even though the FI may not seem to incur an out-of-pocket cash flow/cost due to a counterparty default, the FI may have put on hedges to counteract the market risk in the contract. The FI would have lost money on the hedges.

<sup>11</sup>A variation sometimes seen is that the scenario generation is not an explicit first step; rather, the scenario generation and the trade revaluation are commingled so that only simulated trade values are directly available from the PE-system.

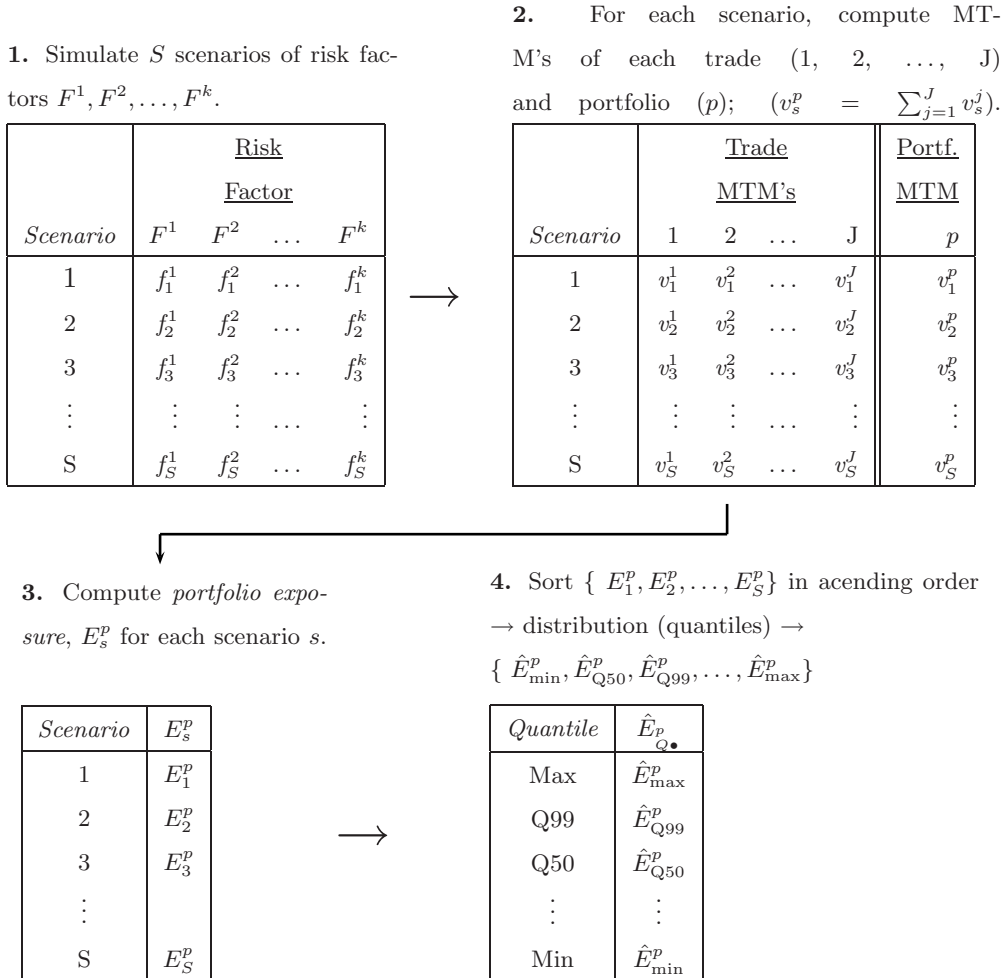
which we discuss below.

Alternative processing

At present, the bulk of trades are processed through some variant of the above scheme. A relatively small fraction (under 10%) of trades may be handled differently. Trades may be systematically (or occasionally) excluded from the simulations for any of the following reasons: because the relevant risk factors are not simulated, the pricing algorithm is too complex or key contract provisions cannot be captured in the simulation. Incorporation of such trades into the regular process is often a future goal. PE's for such trades may be generated via custom calculations or via pre-computed credit factor tables. For the latter, the product of the trade notional and the credit factor is treated as an estimate of the trade's peak PE. In any event, exposures computed via alternative schemes can be aggregated with regularly processed exposures only in rather *ad hoc* ways, introducing biases into reported portfolio exposure.

**Table 1: PE Steps**

Illustrative steps in calculating PE (for a single, arbitrary snapshot date) are shown for a counterparty with  $J$  trades. Collectively, the  $J$  trades are driven by  $k$  different risk factors (each trade may be driven by only a subset of risk factors). In Step 1,  $S$  risk factor scenarios are generated, and trades are repriced at these scenarios in Step 2. The actual calculation of portfolio-level credit exposure (Step 3) differs according to the nettability of the trades. For example, if *all* trades are in the *same* netting set, the exposure for the  $s$ 'th scenario is given by  $E_s^p = \text{Max} \left[ \sum_{j=1}^J v_s^j, 0 \right] = \text{Max} [v_s^j, 0]$ ; whereas if *each* trade is in a *different* netting set,  $E_s^p = \sum_{j=1}^J \text{Max} [v_s^j, 0]$ . ( The generalization to the more typical cases where subsets of trades are mutually nettable is straightforward.) In Step 4, the exposures are sorted to yield a distribution (of  $S$  quantiles), from which PE statistics are extracted. Naturally, each quantile corresponds to a particular scenario; this is useful in understanding what types of risk factor scenarios lead to large credit exposures.





### 3.1 Design choices

For ease of exposition, we will treat the choices relating to scenario generation and trade revaluation separately, as if they could be made independently. In practice, there may be a natural affinity for certain pairings while other combinations may be incompatible.

#### 3.1.1 Scenario generation

##### Mechanics of scenario generation

Typically, scenario generation is achieved by simulating numerous possible paths that the set of risk factors might jointly follow, from today ( $t = 0$ ) to a future date  $t = T$ . In generic terms, a simulation-path of a risk factor is constructed by “piecing together” simulated changes in the risk factor over subintervals  $[\{0, t_1\}, \{t_1, t_2\}, \dots, \{t_{n-1}, T\}]$ . The change in a risk factor over each subinterval  $\{t_k, t_{k+1}\}$  is assumed to consist of a predictable component (the expected change or “drift”) and a stochastic or random component—the chosen statistical distribution specifies precisely the properties of each component.<sup>12</sup> Importantly, the magnitudes of each component will vary with the *step-size* of the subinterval,  $\Delta t_k = t_k - t_{k-1}$ .

The sequence then is simply this. Starting with an initial value of the risk factor: (i) compute the predicted change, (ii) simulate a random shock or perturbation to the risk factor, and (iii) append these two components to to the initial value, to obtain a simulated value (i.e., new level) of the risk factor.<sup>13</sup> A simulation path for the risk factor is generated by repeating this process, treating the prior simulated level as the initial value. When extended to multiple risk factors, the change components across the risk factors may be mutually correlated, and the drift may

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<sup>12</sup> That is, the simulated level of the risk factor for the  $s$ 'th path at snapshot date  $t_i$ , denoted by  $r_{s,t_i}$ , is obtained as  $r_{s,t_i} = r_{s,t_{i-1}} + \Delta r_{s,t_i}$ . For a simple process, the change component  $\Delta r_{s,t_i}$  could be written as:

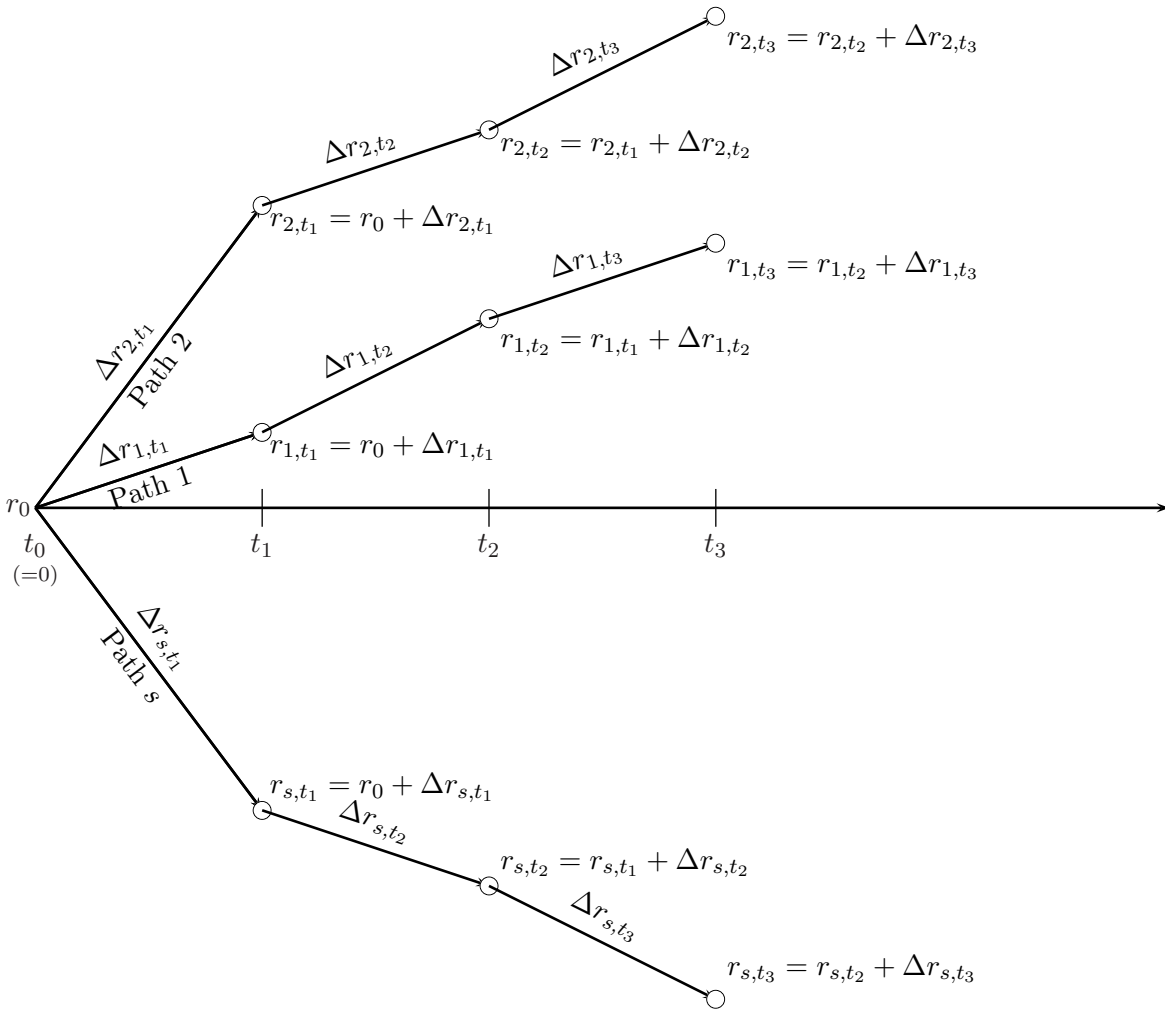
$$\Delta r_{s,t_i} = \underbrace{\mu(r_{s,t_{i-1}}, t_{i-1}) \times \Delta t_i}_{\text{“drift”}} + \underbrace{\sigma(r_{s,t_{i-1}}, t_{i-1}) \times \sqrt{t_i - t_{i-1}} \times \epsilon_{s,t_i}}_{\text{“shock”}}$$

where  $\mu(r_{s,t_{i-1}}, t_{i-1})$  is the instantaneous drift (rate),  $\sigma(r_{s,t_{i-1}}, t_{i-1})$  is the volatility, and  $\epsilon_{s,t_i}$  is a draw from the standardized distribution associated with the specified process (e.g.,  $\mathcal{N}(0, 1)$ ). The notation emphasizes that both the drift (predictable change) and the volatility can vary with the level of the risk factor and calendar time.

<sup>13</sup>The predicted change and the shock conform to the chosen statistical model. Also, the expected change component could depend on earlier shocks along the path—i.e., it need not be completely determined at  $t = 0$ .

**Figure 1: Path simulation**

The diagram provides a visual depiction of the textual discussion of the mechanics of path simulation for a single risk factor. Starting from the initial value of the risk factor,  $r_0$ , a path is constructed by piecing together simulated changes over future subintervals. That is, the simulated level of the risk factor for the  $s$ 'th path at snapshot date  $t_i$ , denoted by  $r_{s,t_i}$ , is obtained as  $r_{s,t_i} = r_{s,t_{i-1}} + \Delta r_{s,t_i}$ . (See also footnote 12.)



depend on the levels of other risk factors—these facets would have to be incorporated into the simulation. Figure 1 provides a pictorial depiction.

Important implementation choices in this regard are two related quantities, the the number of steps ( $n$ ) and the step-sizes ( $\Delta t_k, k = 1, \dots, n$ ). Typically, small step-sizes are used for nearby snapshot dates and larger ones for more distant ones. The implications of alternative choices are discussed later.

### Choice of statistical models

The starting point is to posit statistical models of the relevant risk factors, describing their future evolution, individually and collectively. These models define the probabilities of future outcomes of the risk factors.<sup>14</sup>

Firms tend to use one of two different approaches, which we label here as “real-world” and “risk-neutral”, to choosing the statistical models. Under the real-world approach, one criterion is that the chosen model for a risk factor reflect (at least approximately) key empirical properties of that risk factor as observed in historical data.<sup>15</sup> However, other considerations, often competing, play a significant role as well— e.g., that the model should lend itself easily to simulation; that the required parameters be easy to estimate and be stable and robust. Such trade-offs lead to familiar models such as the Normal and Lognormal being the dominant choices for stochastic models of risk factor behavior.<sup>16</sup> Clearly, this approach is straightforward and intuitive, and can be tailored to the PE-context.

The “risk-neutral” approach invokes the statistical models that are embedded in the front-office derivatives pricing models. Key criteria are efficiency in producing prices and hedge recommendations. A high premium is placed on analytical and implementation tractability, especially

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<sup>14</sup>Speaking somewhat loosely, specifying a statistical model amounts to: (i) choosing a a particular distributional family/type (or, alternatively, the dynamics of the risk factor); and (ii) assigning numerical values to required parameters. Typical parameters are means and variances (to govern the properties of individual risk factors) and correlations to capture dependencies across risk factors.

<sup>15</sup>Of course, this is sensible only if these properties are expected to recur in the future. If there is reason to believe that the future will be very unlike the past, other assessments may be used.

<sup>16</sup>The Normal and Lognormal can accommodate some commonly observed properties, such as mean-reversion (the tendency for a rate/price to revert to a secular average level). But features such as jumps and the tendency for volatilities to depend on rate levels cannot.

the ability to “calibrate” easily to traded instruments. Capturing real-world properties that might be considered for measurement of tail risks is not a fundamental criterion. They are termed risk-neutral distributions, because it is customary to assume a risk-neutral economy to price derivatives. The risk-neutral “drift” (expected instantaneous growth rate) of a risk factor can differ significantly from its real-world drift. For example, under the risk-neutral assumption, the S&P 500 stock index would be expected to appreciate at the risk-free rate, whereas the real-world drift would include a risk-premium and therefore be substantially greater. Over longish horizons (e.g., a year or more), this will lead to noticeably different PE’s (for the same portfolios). In credit markets, the risk-neutral default probabilities (implied from market spreads) are substantially larger than the historical experience—again, possibly because of risk and liquidity premiums. The other important difference, relative to the real-world specification, is that key parameters are usually not estimated from history, but inferred from current market data, during the process of calibration.<sup>17</sup>

To sum up, PE’s computed under these two approaches can be numerically quite different and not necessarily comparable. It is also the case that different validation metrics have to be used for each approach. We do not seek to enforce the use of one approach or the other. But we do expect firms to be cognizant of the differences and build their processes accordingly.<sup>18</sup>

### 3.1.2 Trade revaluation

At a rather abstract level, virtually all models for pricing financial derivatives can be described as conforming to the “risk-neutral discounted expectations” approach. This amounts to specifying and projecting risk factor evolution in a risk-neutral (rather than real-world) economy, propagat-

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<sup>17</sup>Every model is characterized by some *parameters*—e.g., mean and volatility in the simplest models—whose values need to be supplied exogenously, to make the model fully operational. Calibration is a process by which these parameters are inferred from market data. Specifically, the parameters are chosen such that the model then reproduces (to some tolerance) the prices of target market instruments (usually liquid, actively traded contracts, which could be used as hedges or as “building blocks” for complex instruments). In general, trading desks will recalibrate frequently; risk measurement systems may recalibrate less frequently.

<sup>18</sup>As an aside, it is worth observing that, under a real-world framework, the PE-modelling groups “design, own and operate” all major components of the system. Under the “risk-neutral” framework, there would tend to be greater reliance on the front-office staff who manage the desk pricing models. This might confer some administrative benefits—e.g., flexibility in doing what-if and stress test analyses.

ing the instrument’s cash flows (as a function of the risk factor(s)) and discounting at the riskfree rate (rather than a “risky” rate).<sup>19</sup> Of course, numerical methods are used to actually obtain prices and other outputs of interest. While subscribing to the above paradigm, the numerical schemes may differ according to the statistical model(s) assumed for the underlying risk factor(s) and the instrument’s payoff structure and contractual features (early exercise, termination, conversion, etc.). As a result, the numerical methods that implement pricing models differ widely in their complexity and computational burden.

The major methods can be grouped into three broad categories: (i) closed-form expressions (the simplest and fastest; versions available for a range of basic products—vanilla options, interest rate swaps, etc.); (ii) trees/finite-difference methods (deliver fast and accurate results for a broad range of instruments, including those with early exercise features, moderate path-dependence—a prime choice for instruments dependent on up to two risk factors); and (iii) Monte Carlo simulation (slower, accuracy dependent on number of simulations; necessary for instruments dependent on numerous risk factors or with complex path-dependence.) While certain pairings of instrument and method are natural, they are far from being absolutely necessary. For instance, by ignoring certain contractual features one may be able to apply a less time-consuming method and obtain approximate results—e.g., treating an American option as an European option, one could use a closed-form expression. For PE purposes, sufficiently accurate results may be obtained via *approximations*—. Thus, the basic trade-off is between computational speed or burden versus accuracy (in prices or risk-sensitivities), a subject of enduring interest among researchers (academics and practitioners).

In the PE context, the key point to note is that the computational burden is substantially magnified (relative to the desk’s needs) since the repricings have to be carried out at each simulated scenario at each horizon in the simulation set. In that sense, the PE calculation is like a succession of VaR calculations. Therefore, PE-modelling groups have to make judicious choices with respect to revaluation models.

For certain instruments, it may be possible to use a front-office model.<sup>20</sup> In other cases,

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<sup>19</sup>The set of possible outcomes are the same under the real-world and risk-neutral spaces; however, the probabilities of individual outcomes are different—hence the payoffs as such are unchanged, only their probabilities are altered.

<sup>20</sup>Sometimes, different desk-pricing models (with different risk factor dynamics) may be applied to different instruments, even with closely related underlying risk factors. This can give rise to some inconsistencies. E.g.,

this may be impractical, so that an approximate model or a version adapted to the PE-context may be used instead. Such approximations and adaptations can take many forms—e.g., treat an American or Bermudan option as an European (by ignoring the early exercise feature) and hence price via the closed-form formula. The potential errors introduced by such approximate models, *vis-à-vis* a benchmark such as a front-office model, are *not* constant, but can vary with the levels of the risk factors. It is, therefore, important to regularly monitor the performance of such models.

## 3.2 Implementation issues

A sampling of implementation issues are noted below to provide a flavor for the kinds of decisions that have to be made, once the broad scenario generation and revaluation methodologies have been chosen.

### 3.2.1 Scenario generation

- Number of scenarios: The mathematical specification of a statistical model is translated into subsequently usable simulated values (of the risk factor) via draws from a random number generator. Thus, the simulated distribution is a “noisy”, imperfect depiction of the mathematical specification, particularly so in the tails of the distribution, a common focus of interest. The degree of noise is related to the number of simulation draws used; but increasing the number of draws is computationally costly.
- Discrete “snaphsots”: Since the counterparty could default at any future date, in principle, it would be necessary to compute exposures at a large number of future horizons (e.g., every day over the life of the portfolio). This would be computationally infeasible and also probably not necessary. Standard practice is to generate “snapshots” corresponding to T different future horizons;
- Number of steps in simulation: For certain statistical models, a statistically valid distri-

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in the interest derivatives world, a one-factor model (which implies that rates of all maturities are perfectly correlated) may be used for certain instruments and a multifactor model (which allows for imperfect correlations across maturities) for others.

bution of a risk factor at a snapshot date can be obtained in a single step.<sup>21</sup> While the savings in computational time are clear, this can create problems for pricing path-dependent instruments, since the path is not simulated at all.

- Step-sizes in simulation: In the more general case, the number of steps and the step-sizes have to be specified. The fewer the number of steps and the larger the step-sizes, the lower the computational burden. However, larger step-sizes result in increasing “discretization error”—i.e., the simulated distribution begins to diverge from the target distribution.

Another unrelated problem arising from the use of discrete snapshots is that the peak exposure of a trade may fall between the simulated horizon dates; how this is handled differs across implementations.

- Omitted risk factors: Because of lack of data or other reasons<sup>22</sup>, certain risk factors may be omitted from the simulation.
- Estimation: under the real-world approach, parameters are estimated from historical data. The length of history to be used, estimation techniques, etc., are decision variables..
- Calibration: under the risk-neutral approach, there are several decisions concerning the calibration: instruments to include in the calibration set; frequency of (re)calibration (if different from the front-office practice), and so on.
- Separate simulations: The discussion so far (e.g., section 3) has suggested that the entire set of risk factors (across product classes—equities, rates, currencies, commodities, etc.) are simulated jointly. In the real-world framework, while possible<sup>23</sup>, this is not always the practice.<sup>24</sup> For desk pricing models, such “global” modelling considerations tend to be

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<sup>21</sup>For example, for a Normally distributed variable with constant volatility and drift, the distribution at any arbitrary future date can be obtained *without* simulation—i.e., in a “single step”.

<sup>22</sup>E.g., under the risk-neutral approach, if the front-office model does not allow for stochastic volatility, then implied volatility cannot be a risk factor. Or, only parallel shifts of a yield curve may be simulated.

<sup>23</sup>E.g., by specifying cross-factor correlations

<sup>24</sup>Specifying correlations, either from historical estimation or on theoretical considerations, is not always easy. One issue would be whether to use different correlations for short horizons versus long horizons (risk factors may be “cointegrated” over long horizons). However, allowing for such parameters (correlations) seems quite valuable, e.g., for carrying out what-if and stress analyses.

inherently unimportant, and therefore unlikely to be part of the native model specification. Consequently, in a risk-neutral PE framework, such specifications have to be introduced exogenously. Implications are considered later.

## 4 Types and sources of mismeasurement

As sketched above, the basic steps of PE methodologies are conceptually straightforward, but they do require some design and implementation choices, introducing nuances and variation across implementations. Moreover, given the sizeable amount of data to be sourced and processed and the numerous statistical and revaluation models deployed, production versions tend to be rather large, complex systems wherein errors and mismeasurements can creep in from various points. Outlined below are the major common and likely sources. Naturally, this is not meant to be an exhaustive, but rather an illustrative, list.

### 4.1 Position & related data

Several different types of data have to be assembled for the PE calculations. Position data (trade type, trade terms such as maturity, currency, strike, etc.) and other contract provisions (e.g., cancellation/extension options)) may be sourced from middle- or back-office systems. Counterparty information (obligor legal entity, netting status,...) are sourced from other specialized databases. Current market data on risk factors may be obtained from front-office or other risk systems.

Errors can arise because of incorrect data entries or errors in file/data transfer, to name only two possibilities. Firms have a battery of ongoing processes and routines to detect and correct errors in these areas. Such efforts would include staff from, e.g., operations, middle/back offices, controllers, and trade reconciliation teams.

### 4.2 Scenario generation

The earlier discussions have already hinted at the many questions that might be raised about a particular statistical specification employed in the simulation. They are reiterated below.

- Omitted risk factors



- Omitted parameters—e.g., certain correlations may be assumed to be zero, or, more generally, actual cross-factor dependencies may be more complex than specified in the methodology.
- Actual statistical properties (dynamics or distributional) are different from what is assumed in the simulations: parameters need to be updated, or more fundamentally, dynamics or distributions need to be revised. It is necessary to keep in mind, however, that the “true” statistical properties of risk factors are, effectively, unknown and unknowable. Thus, while updating based on recent experience seems like a sensible practice, it is not a logical or statistical necessity.
- Instruments with early-exercise features or path-dependent cash flows may be mispriced—for reasons described in 3.2.1
- simulation noise

### 4.3 Trade revaluation

Mismeasurements in revaluations could arise from the following:

- The use of approximate or customized models.
- A front-office model used in the PE-system begins to systematically diverge from market prices. Our view is that such model deterioration should be monitored as part of ongoing PE validation (even though it usually falls to other teams to remedy defects in front-office models).
- Under the “real-world” scenario generation approach, the current MTM produced by the PE-system may differ from the desk mark (even if both use the same pricing model), because of differences in assumed risk factor dynamics. This inconsistency potentially raises a more fundamental question about the reliability of the PE numbers. But this is an inherent drawback of the real-world scenario generation approach and not easily fixed. It does underline the importance of tracking this type of discrepancy over time.

- Under the risk-neutral approach, the MTM generated by the PE-system (i.e., PE at  $t_0$ ) may differ from the desk mark if the PE-system is not recalibrated at the same time as the desk.

#### 4.4 Portfolio exposure and aggregation

Full-fledged simulation (i.e., all the risk factors are simulated jointly) offers two important benefits over alternative approaches to scenario generation. First, since the exposure calculations are done at the scenario-level, netting is automatically done correctly. Second, the diversification (at the portfolio-level) arising from the less-than-perfect correlation among risk factors is recognized automatically as well. Deviating from full-fledged simulation gives rise to the kinds of mismeasurements noted below.

- When the risk factors are not simulated jointly (e.g., if different product areas (interest rates, equities, etc.) are simulated separately), the question arises of how to aggregate exposures from these different simulations. The methods vary—but it is a possible source of mismeasurement if the natural diversification and cross-product netting are not properly accounted for.
- For various reasons,<sup>25</sup> the exposures for certain trades may need to be calculated outside the simulation framework. The question arises of how to aggregate exposures of such trades into the simulation-computed exposure—all approaches invariably give rise to mismeasurement of portfolio exposure. E.g., the peak exposure of the *trade* may be fed as a *constant* value to all the “regular” simulation scenarios.
- The reported time-profile of peak/tail-quantile exposure is constructed from the distributions at the snapshot dates. As noted earlier, the peak exposures of certain trades (and hence, portfolios) may lie *between* the snapshot dates.

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<sup>25</sup>The relevant risk factors for the instrument may not be simulated; there may be no revaluation formula for the instrument in the PE-system; certain trade details may be missing or fed incorrectly.

## 4.5 Other

Finally, to give a flavor of the varied sources of errors, we mention one other—the modelling of collateral in the presence of minimum transfer amounts and non-zero thresholds for margining. In this case, it becomes necessary, in the simulation, to keep track of when the last margin call might have been made and for what amount—as noted previously, such “path-dependence” may be difficult to incorporate. Approximate procedures may be used, giving rise to inaccuracies.

## 5 Ongoing PE validation report

### Challenges to validating PE methodologies

It is worth first commenting on the particular challenges to validating PE methodologies. A core component of a PE methodology is the statistical model used to describe the future evolution of the risk factors—in effect, it is a forecasting model. The “classic” approach to evaluating such a forecasting model is to compare model-predictions against observations or realizations. Obtaining reliable statistical inferences under such an approach requires a “reasonable” sample size. In a PE-context, one is dealing with long-range forecasts (e.g., multi-year horizons); so, to obtain a good-sized sample of realizations<sup>26</sup> requires reaching fairly far back into history. It may be difficult to obtain a sufficiently long history of high-quality data; more perniciously, over longer intervals, the statistical process may be “non-stationary”—loosely speaking, the model properties may have changed over time. Thus, statistically-oriented “backtests” are very difficult to apply in the PE-context.<sup>27</sup> Recognizing these difficulties in specifying a particular validation technique, the Basel document has only a broad requirement that PE-models/methodologies be validated.

### 5.1 Overview and rationale

We will be requiring firms to submit a periodic report in connection with ongoing PE validation. The report will include a core set of metrics, developed in consultation with each firm, to track the empirical performance of the PE-system, plus supplemental analysis firms may optionally

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<sup>26</sup>The inferences are valid only if the observations are *statistically independent*—i.e., non-overlapping.

<sup>27</sup>Statistical backtests have been shown, even in the context of daily market risk VaR backtests, to be ineffective because of their “low statistical power.” In part, this is due to the difficulty of obtaining a “reasonable” sample size. This problem is severely aggravated in the PE context.

provide. We will have detailed discussions with the firms concerning the contents of each report. The documentary evidence in the report coupled with the discussions will help us evaluate the performance of the PE-system and the firm's internal PE validation program.

We have worked closely with the firms to develop an initial set of metrics and analyses suitable for such a report. We have sought to emphasize measures and analyses that are, on an ongoing basis, meaningful and intuitive indicators of the quality of the model outputs. These include, for example, comparison of model outputs to some empirical equivalents/realizations, analysis of model outputs in their own right, and occasional ad hoc analyses depending on market events. Tests focussed purely on "statistical hypothesis testing" (e.g., backtests based on exception-counting) are only one of many measures.

One important theme in the chosen measures is that they provide timely signals of possible developing flaws. For example, several metrics examine the responsiveness of various PE measures to changes in market conditions. Differences in expected and actual behaviors of such metrics, particularly around significant shifts in market dynamics, will be a trigger for discussions with the firms. Another theme is that the chosen metrics represent, to the extent possible, modifications and extensions of diagnostic and validation tools already employed by the firms.

In evaluating firms' PE validation programs and developing PE validation metrics, we will take a broad view of what constitutes validation. All analyses, processes, etc., aimed at generally assessing the quality and integrity of the reported CE and PE numbers will qualify as candidates. In our judgment, such a holistic view is essential, given the diversity in firms' methodologies, internal structures and processes, and so on. It recognizes that metrics that are sensible in one context may be quite meaningless in another, and that relative weaknesses in certain areas may be offset by strengths in others.

## **5.2 Contents of the periodic report**

The reports submitted by the firms will include a common set of data and metrics across firms as specified by us, plus whatever supplemental information each firm chooses to include. The common data will fall into these broad categories: (i) background data; (ii) data on simulated risk factors; (iii) data on CE's and PE's; (iv) miscellaneous. We elaborate on each below.

### 5.2.1 Background information

This part of the submission will focus on background data which will help in understanding firms' exposure profiles but are not part of the routine CSE-submissions. The motivation is to develop a good sense of how well the reports will cover and represent the firm's actual exposures. In particular, if areas of material exposures will not be covered (for operational/logistical reasons) under the initial submissions, this will be a way to alert us of that. Additionally, we would like to identify significant or interesting pockets of exposure, and clearly understand the methodology in these areas. The following kinds of quantitative data are aimed at these broad goals.

#### 1. CE's, PE's (aggregates) by.<sup>28</sup>

- broad business area (Fixed Income Derivatives, etc...)
- domicile of counterparty
- counterparty type (hedge fund, corporate, ..)
- counterparty rating

With some variations, much of the above information is already supplied to us via the routine CSE-submissions; they're included here for completeness.

Below, we outline some non-standard extensions. We emphasize that these're *not* for profiling a firm's potential dollar losses, but oriented towards other types of questions—e.g., understanding exposure to “model/methodology risk” (how reliable is the methodology in areas of “large” exposures? what is the exposure in weakly-modelled areas?). While the metrics will numerically be aggregates across counterparties, they should not be interpreted as a firm's total dollar exposure. We would look for CE and PE by:

- product type (exotics, complex derivatives, long-dated trades, exotic underliers, CDO tranches, inflation swaps,...),
- risk factor (natgas prices,...),
- model

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<sup>28</sup>(before and after collateral, if possible)

## 2. Lists of Large CE's, PE's:

Again, we already receive basic data of this type as part of each firm's monthly and quarterly filings. Some useful extensions might include CE and PE figures:

- broken down by some of above subcategories,
- by margined and unmargined counterparties
- by "wrong-way" risk counterparties

### **5.3 Simulated risk factors**

Firms will be providing us data relating to end-of-quarter conditions as well as intra-quarter fluctuations, for key risk factors representing each broad product area. The data will be in the form of plots and summary statistics of projected future distributions.

Specifically, as of the date of a simulation run, the projected future distribution of a simulated risk factor can be summarized by a few percentiles (e.g., 95th, 75th, 50th, 25th, 5th). These projections will be available for different horizon/forecast dates (2 weeks ahead, 6 months ahead, 5 years ahead, etc.). For term structure types of risks, a few points—e.g., 3M, 2Y, 5Y, 10Y—will be chosen as representative risk factors.

For the end-of-quarter data, we will receive plots of projected distributions for select horizon dates. This gives a sense, at quarter-end, of the ranges of future factor-moves anticipated by the PE-simulation models.

Intra-quarter data will be based on snapshots during the quarter (e.g., at weekly intervals). In this case, we will focus on on the projected future distributions at a few "anchor" horizon dates (e.g., 1-year ahead—this selection could be factor- and model-dependent). The changes in projected distributions can be analyzed to see if they are consistent with and reflective of observed moves in risk factors/inputs. These changes address the broad question of whether the "models" for scenario generation are working "as expected" (is the model output consistent with changes in input values?) In particular, one would expect (absent complex interactions and other offsetting features) large observed moves in risk factors or inputs to induce changes in the

projected distributions.<sup>29</sup>

#### Future extensions

Going forward, we will seek to extend along the following dimensions:

- Segregate by: high-exposure areas, risk factors that have proved "easy" to model as well as "difficult" ones, risk factors subject to low and to high estimation error.
- Where static inputs or parameters are assumed—e.g., some cross-factor correlations—an occasional comparison of realizations against the assumed values.
- Comparisons against prototype alternative models of risk factor dynamics.
- What-if and "stress" tests.
- Maintain a a (short) list of key omitted risk factors, and, if possible, occasionally assess the impact of their exclusion.

#### **5.4 CE and PE**

In similar fashion, firms will also be providing us end-of-quarter and intra-quarter data on CE's and PE's. We are requesting that firms report these data for: (i) live portfolios; (ii) "generic" trades (e.g., on-the-run 5-year interest rate swap; 1-year ATM option); and (iii) portfolios of generic trades. Our expectation is that we will have a large and representative set of generic trades as the process unfolds.

We will receive end-of-quarter CE's and PE's (time-profiles of exposures) for such trades. We will also receive intra-quarter CE's and PE's (for selected horizon dates). Again, the idea is to see how the computed exposures track observed changes in risk factors, inputs, and market conditions. One variation here is to compare the each CE to the 2-week prior PE forecast.

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<sup>29</sup>Key inputs to the scenario-generation models include the *current* levels of the risk factors as well as "process parameters" (volatilities, correlations, etc.). Current levels of market-observable risk-factors are relatively easy to obtain and are therefore likely to be updated frequently, e.g., daily. Process parameters are different. If front-office dynamics are used for scenario-generation, recalibration is likely to take place fairly often (e.g., weekly, at least monthly). If the "real-world" approach is used, updating may be done less often, e.g., quarterly. In such cases, we will emphasize the importance of having mechanisms to monitor divergence between parameter values being used by the PE methodology and market-implied parameter values.

Ideally, these analyses should be based on CE's and PE's uncontaminated by the effects of upfront and daily margins (and of other risk-mitigants whose contribution varies with exposure level or with time). E.g., under daily margining with zero threshold and zero minimum transfer amount, the reported CE, post-margin, would be zero every day—in which case, comparison of CE against the 2-week prior PE forecast would be meaningless. We will discuss the practicality of such reporting, mindful of systems constraints.

Under the “real-world” scenario generation approach, the current values computed via the PE revaluation formulas may not match up with the desk marks, from which CE's are derived. This inconsistency potentially raises a more fundamental question about the reliability of the PE numbers. But this is an inherent drawback of the real-world scenario generation approach and not easily fixed. It does underline the importance of tracking this type of discrepancy over time.

#### Future extensions

As with the simulated risk factors, the following additional types of analyses could be done.

- Report CE and PE for, and extend some of above analyses, to generic “strategies”<sup>30</sup>
- For portfolios, the model-predicted change in CE (i.e., revalue the trades, using the PE reval formulas, at the new levels of the risk factors) could be compared against change in CE based on market prices/desk marks. If realized cross-factor correlations (joint movements) differ significantly from those assumed in the methodology, exposure diversification predicted by the methodology would be different than realized “diversification”/offset, and that may show up in portfolio CE.
- Comparisons against prototype alternative reval approaches, new pricing algorithms.
- What-if and stress tests.
- Obtain CE and PE numbers that are not adjusted for risk-mitigants.
- Analyze PE contributions computed outside the simulation framework more systematically.

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<sup>30</sup>Long-short; curve plays; dispersion trades; arbitrage (capital structure, credit); basis trades (CDS vs. bond), etc. across product areas.



Assess their impact on reported PE's by counterparty, etc. Examine how such PE's are updated in response to changing risk factors, market conditions, etc.

#### 5.4.1 Supplemental information

The periodic report will be supplemented by information emerging from other internal analyses and processes.<sup>31</sup> For example:

- As part of major methodology revisions, “parallel runs” are conducted to study the effects of the methodology-revision on model outputs.
- Model-related issues that are identified via model-control processes (price-verification; P&L explanatories, Internal Audit, etc.)
- Operational matters—bad data feeds, file transfer problems, et cetera—impinging on the computation or reporting of CE and PE numbers.

## 6 Bottom-up approach

The second prong of our PE validation program is a “bottom-up” approach. Here, we will focus on understanding the technical, analytical and implementation details of the PE methodology and its components. We will be doing this for a subset of models selected on considerations such as materiality of exposures, model complexity, and so forth. We will develop specific questions based on the technical documentation supplied by the firms. For example, we would seek to fully understand: (0) the products and instruments covered by each model; (i) the simulation structure—the assumed dynamics for the risk factors; the estimations /parametrizations of these processes for the simulation; construction of the simulation paths, and so on; (ii) the revaluation schemes at the future dates, including approaches to non-vanilla instruments; (iii) aggregation approaches. We will commence this field work once the periodic reports are well underway.

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<sup>31</sup>Discussions of major project initiatives relating to the PE-methodology (models, etc.), infrastructure (feeds, systems, . . .), reporting conventions, and the like (any of which could ultimately affect reported CE's and PE's) take place as part of our ongoing supervision. Firms also notify us of “minor” changes.

For some applications, firms often build custom analytics and methodologies outside the regular PE framework—notably, to measure the risks and size (theoretical) initial margins to hedge fund counterparties. We will review these as well.

## 7 Summary and Conclusions

Supervisors and firms alike have a strong interest in ensuring that PE-methodologies are well-constructed and that the outputs of the PE-systems are sound and reliable. Developing a coherent validation strategy has been an important priority for us, since the CSE-firms are among the earliest adopters of the Basel II standards (in particular, the use of *expected potential exposure* for calculating regulatory capital).

This paper focusses primarily on one component of our validation approach, namely a quarterly report submitted by the firms that allows us to evaluate, on an ongoing basis, the empirical performance of a firm’s PE methodology and the robustness of its internal validation program. As discussed in the text, validation of PE-methodologies poses some unique challenges. In particular, the amply documented deficiencies of statistical backtests for daily market risk VaR are substantially exacerbated in the PE context. We have opted therefore to emphasize simple but plausible and intuitive metrics that provide timely signals of possible flaws in the methodology. It is also worth reiterating that the metrics in the report are patterned after ones used within the firms for internal risk measurement and governance, underlining their relevance and usefulness for us as well as for the firms.

**Subject:** Model Control at Lehman: meeting (June 20, 2005) notes

**Date:** June 27, 2005

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As part of the CSE review, the purpose of the meeting was for Lehman staff to introduce to us the bank's "Model Control" framework. This note summarizes the discussion of the meeting. The "Risk Management Group: Quantitative Risk Policies and Procedures Manual" has related narrative (p. 7-9). Attendees from the SEC were Lori Bettinger, Matt Comstock, Jim Giles, Mike Hsu, P.C. Venkatesh. Lehman staff present included: Eduardo Canabarro and Manhua Leng from GRMD, Gerry Reilly and Neeraj Chopra from Product Control, Beth ? from Audit.

## 1 Background and preliminaries

### 1.1 History

The Model Control framework is a recent initiative at the bank, and, in fact, as of this writing, is formally in effect only in the Equity division. Some aspects of the initiative serve to provide clearer structure and formality to existing practices. Other aspects of the initiative, however, are new to the organization.

#### Questions:

- Approximate dates re: evolution of this framework (relation to SOX 404)
- Which aspects are genuinely new and significant (e.g, possibly, standards on model documentation?)

The main tenets of the framework are outlined in the document "Risk Management Group: Quantitative Risk Policies and Procedures Manual" (p.7-9). The discussion during the meeting concentrated on valuation models—i.e., those used by traders for marking their books, and by Product Control for price verification.<sup>1</sup>

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<sup>1</sup>Other types of models/methodologies may be subject, in some form or the other, to some components of the Model Control framework—e.g., text in the manual indicates that the VaR and MPE methodologies will be reviewed by the Model Validation group (part of QRM). This is reasonable in that these methodologies are clearly distinct from FO models in some important respects—e.g., "security" concerns are considerably lower, and, since

Questions:

- If the Model Control framework is meant to apply firm-wide, should it not be part of a firm-level manual, rather than of just GRMD's manual?
- Moreover, since one important purpose of the policy is to formalize the responsibilities of the various parties, that would have to be a firm-level, rather than GRMD-level, manual.
- Get a clearer statement regarding the scope of models/methodologies subject to the new framework (which elements apply to what type of model/methodology).
- What does the bank see as the chief objectives of a Model Control framework?<sup>2</sup> (I.e, how well do the proposed mechanisms meet the intended objectives?)

## 2 Main elements of the framework

As presented, Model Control responsibilities rest with three broad groups: (i) Business units, including Quantitative Research, Analytics and front office Technology ; (ii) Risk Management (GRMD); and (iii) Product Control. These responsibilities are broken down across the groups as follows.

The business units are clearly central in many respects and bear the most responsibility—ultimate "ownership" of a model resides with the business. Quantitative Research has some basic responsibilities: developing, implementing, testing and fully documenting the models. Additionally QR is also charged with populating and maintaining the model inventory/library; tracking they do not require price-verification and the like, there is no comparable role for Product Control. However, since these methodologies are also developed and owned by QRM, there is certainly a question as to the *independence* of the review.

<sup>2</sup>There can be a broad set of possible objectives:

- independent assessment/check of: model quality, model risk, suitability, etc..
- develop recommendations on: limits, reserves/valuation adjustments, operatin range of model
- controlled environment for housing models: prevent and detect unauthorized access; prevent and detect use of unapproved models; prevent and detect unapproved use of approved models
- change control processes: approvals, notifications, etc.

model usage and compiling related statistics—note that such functions should arguably fall under Independent Model Validation (i.e., GRMD). As represented to us, another crucial function played by QR is an internal peer-review process of QR-developed models. Most importantly, QR has the first line of (temporary) approval authority for both QR-developed models as well as trader-developed "spreadsheet" models. In other words, trades cannot be booked on a model which does not have QR-approval. While technically a "business unit", they do not report to individual traders. Analytics and technology (within each business) are responsible for implementing the models—maintenance control of the computer code, implementing regression tests, and providing notification of code changes and releases.

Questions:

- May want to meet with the QR groups to assess a number of things; reporting lines; how some "independence" is achieved within an internal peer-review, and the review of trader spreadsheet models is conducted; what sort of limits they place; how they assess model risk, etc.
- Will need to look over some of the model binders to get a better sense of this.
- The BU is responsible for notifying RM and PC of new models and "material" changes to exiting models, and to provide related documentation. Illustrations of what constitute material changes; standards thereof?

In principle, Risk Management has a broad range of responsibilities vis-a-vis Model Control: e.g., model review/validation, providing guidance to Controllers on model-related matters, and most importantly, ultimate (along with Product Control) approval authority. However, in practice, Risk Management's role is expected to be more circumscribed. It is expected that RM will diligently monitor: (i) the flow and pipeline of new models approved by the businesses; (ii) review developer-supplied documentation for compliance with standards prescribed by the Model Control framework. But GRMD is unlikely to be doing detailed model review/validation, relying instead on the QR peer review. I.e., GRMD would not be evaluating the theoretical framework, the model assumptions. Nor would it evaluate issues arising from the choice of a particular numerical implementation—e.g., stability/error of prices, sensitivities. It might consider more

closely issues related to calibration, observability of inputs. It is also unclear to what extent Risk Management will be assessing the appropriateness/suitability of a model for its intended usage. GRMD might develop a metric of model risk based on the sensitivity of a model to unobservable inputs.

Questions:

- Look at sample reviews, including ones Manhua selects as having high GRMD contributions. Have her explain how she went about the review.
- Assess the quality of QRM's contributions.
- Did more complex models get a more detailed review?
- Have them point out instances where GRMD has provided guidance to Controllers on models (scope, calibration, limitations, valuation adjustments)
- On model spreadsheet, look at some recent approvals and get a flavor of what was done (e.g., just approval of documentation compliance, or something deeper?)
- Many models show approval dates of several years ago. Plans for re-review; topic at Model Control Committee?
- Is there a similar inventory of "utility" routines—curve constructors; skew-builders, etc.?
- Inquire if above characterization of expected GRMD role is reasonable.
- What is GRMD's expected expenditure of time on each of these functions?
- Perhaps we should eventually form an opinion of the Model Validation function, relative to peer practices,<sup>3</sup> to self-stated goals, to past representations? Taking into account context and the ground realities.

Product Control was also presented as being a key participant in the Model Control framework, via their functions of: (i) price-verification of model input parameters; (ii) reviewing model

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<sup>3</sup>There is wide variation across firms in Model review/validation in several aspects/dimensions. E.g.: (i) scope/purview—types of models; what aspects of models should be reviewed; implementation accuracy;..

suitability for transactions as per model documentation and risk management guidance; (iii) assessing and approving model valuation adjustments. Product Control is well-situated to detect/uncover misuses of a model—e.g., if a trader chose to mark a trade using a model not approved for that trade, this may be detected when Product Control price-verifies (monthly) the trade using the approved model for that trade. Likewise, if the trader marks to an unapproved model, and this model’s sensitivities are different from that of the approved model, this may show up in the daily ”sensitivities-reconciliation,” or possibly in the daily P& L explanatory exercise.

Questions:

- Is there such a ”sensitivities-reconciliation” procedure? (carried out by product control.
- P& L explanatory are not done at trade-level but at higher levels of aggregation; therefore, only ”large” trades are likely to be detected this way. Note, however, that Product Control cannot police or resolve other kinds of model risk. E.g., for a model with a key unobservable input (e.g., volatility or credit correlations) on a product with no liquid proxy, a trader’s mark may differ from Product Control’s simply because each employs a different value for the unobservable input. This is not quite a model defect—rather a disagreement over input values.

## 2.1 Stages of a model

A typical sequence is the following. Since all (valuation and FO) models must first pass through QR, initial approval comes from QR. This is considered to be ”temporary” approval. Along with temporary approval, QR may place limits, e.g., in the form of volumes/number of trades to be priced by the model. Additionally, PC may require reserves on temporarily approved models.

A model is considered to be ”fully approved” only when they have approvals from BU, RM and PC. Limits may be placed at this stage as well.

We were told that the time taken for a model to graduate from temporary to full approval varies considerably, according to the model’s complexity. As a general rule of thumb, Equity models tended to be modest variations and quickly addressed; FI models were more complex and took longer.

Questions:

- Are limits *required*, or optional for temporary approvals? Perhaps we could look at some temp approvals and see what limits have been placed.
- We could look at some reserves required by PC for new models.
- Look at turnaround times for a sample of models.
- Are limits placed with respect to a range of market-observable parameters?. I.e., values of certain market parameters, e.g., FX volatility/skew may indicate a profound change in market conditions, under which the original model may not be applicable

## 2.2 Model Control Committee

A Model Control Committee has been formed, to provide a forum for discussions of issues related to model control. It does not have approval authority. It is chaired by the BU and members include senior representatives from QR, Analytics, RM, PC and Technology; other guests may be invited as appropriate. The committee has scheduled meetings every month and may meet on an "extraordinary" basis as well. Its mandate is quite broad and enumerated on p. 6 of the presentation doc.

### Questions:

- Do we want to look at some meeting minutes?
- Ask Eduardo as to some of the interesting discussions that have transpired; significant outcomes (e.g., re-review of a model, etc?)

## 2.3 Model documentation

A standard documentation template is required, so that the documentation for each model has to address each of the required elements. The specific elements are enumerated on p. 7 of the presentation doc. In my view, the list is quite reasonable.

The model documentation is made part of the Model Control database.

### Questions:

- A possibly useful addition would be to require developers to sketch alternative models in existence and the reasons for their choice.



## 3 Status of the Framework

### 3.1 Implementation at the Equity division

\* The new process is in place for the Equity division and key aspects include: (i) institution of regular monthly Model Control Committee meetings; (ii) development of a complete and measurable model inventory; (iii) an approval process with automatic notification and full audit trail. The inventory contains details on: (i) the approval status, the volumes/risks of each model (weekly report); (ii) daily report on lists of models with temporary approval; (iii) display of PC-required reserves for models with temporary approval. As per the presentation, the Model Control Committee uses this inventory report to prioritize reviews and re-reviews.<sup>4</sup>

#### Questions:

- The text reads "The enhanced control framework is implemented for new or materially changed models." Which raises the question of whether the framework applies *only* prospectively? I.e., the set of models existing as of circa Dec 2004 will not be re-reviewed for conformance with the new standards?
- How does the Model Control Committee use this report to prioritize reviews? What elements of this report is used to make those determinations? I.e., which elements are indicators of high/increased model risk?

### 3.2 Implementation at Fixed Income Division

The framework is not yet formally in place for FI. In the interim, control is effected via a set of "Primary controls" and "Detection controls."

The set of primary controls are enumerated on p. 15 of presentation doc. Meeting notes: Has been in place over last 6-7 months [??CHECK]. Model Control Committee considers model

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<sup>4</sup>Eduardo observed that, as supported by the report, the bulk of trades are booked on models that have been extensively time-tested, so that the associated model risk is quite low. He said the proportion of "exotic" trades, booked on models where model risk, a priori, might be higher, is quite low. Nonetheless, the firm argued that because of proprietary content, SEC staff would be allowed to review the model documentation only on Lehman premises.

vintage as a criterion for periodic re-review. Technology is independent of business; has a 10-step change control process.

The set of detection controls are enumerated and discussed on p. 15-20. Meant to detect "model change" -  
• Product control does so via P& L process; new transc [?]; day 1 P& L -  
• Operations: trade capture; MO picks up unique features of trades; margin and settlement process (counterparty confirms)

Questions:

- Would like to better understand the difficulties in instituting this framework at FI; compared to the Equity implementation, what are the pieces not yet present in FI (e.g., agreement on model documentation standards)? what remains to be done, anticipated timetable, etc.?

## 4 Miscellaneous

Models are not rated or graded along any dimension (e.g., model-risk). It would seem that an important objective of a Model Validation exercise would be to develop metrics of model risk.

**From:** P.C. Venkatesh

**Subject:** Model Development and Model Control at Morgan Stanley

**Date:** March 19, 2005

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## 1 Introduction

MS employs quantitative models (i.e., those involving mathematical, statistical and computational components) in a variety of forms and settings. Several models are essential parts of critical functions at the bank, and MS has accordingly established a “model control process.” to safeguard the integrity and operation of these models. The process is meant to implement policies set forth in Section 9.5 of the Authorizing Guidelines and the attendant Risk Management procedures. It is important to note that the scope of the Model Control Process is restricted to *valuation* models. For this discussion, Valuation models are further defined as models used for Marking the books of existing trades (Mark to Model), or for generating risk measures that are explicit inputs to Firm risk systems.<sup>1 2</sup>

### 1.1 Some background: why are models and model-controls necessary?

Before proceeding to the specifics of MS’s model control processes, it may be helpful to first consider the role of models at institutions such as MS, and the need for model-control processes.

In some cases, securities *identical, in all respects*, to the bank’s positions/holdings might trade in an active and observable market—an example being exchange-traded shares or futures contracts. In such cases, the bank’s positions could be re-priced using the directly observed prices; no model is necessary. In some markets, e.g., OTC derivatives, it may be very difficult to find a traded price for a contract identical in all respects to the bank’s holding will trade again. For instance, for interest rate swaps, active and liquid markets exist for certain maturities—e.g., 9 years, 10 years, and so on. So, in trying to revalue a trade with remaining maturity of, say,

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<sup>1</sup>The definition includes models used for calculating Portfolio Valuation Adjustments that impact the Firm’s Books and Records; however, bank personnel indicated that these were not significant (??–reword this)

<sup>2</sup>Thus, VaR and PE methodologies do not fall under this scope. “Non-valuation” models used in trading decision are also not in scope.

nine and a half years, one would be unable to find a direct market quote. A swap rate for nine and a half years has to be inferred from the observable quotes on 9 and 10 year instruments. The numerical procedure (and associated assumptions) to compute this inferred value constitute a model, albeit a fairly simple one. As another example, quotes may be available on 1-year European call options on GM for strikes of 20 and 30, and we may to value an option with strike of 40. Again, the approach would be to assume that a certain option pricing model is applicable, infer the necessary information (market-implied parameters) from observed quotes to reprice the trade on the books. Alternative option pricing models may be used in this inference step;<sup>3</sup> in general, leading to different repricing values for the target/existing trade. For some range of values of the underliers, option values can become highly sensitive to parameter inputs; that is, small changes in input values lead to large changes in the option price. Put differently, small deviations in estimating the market-implied parameters can lead to large changes in the repricing of the existing trade. In other words, the repricing becomes sensitive to the actual computational procedure used in the inference or calibration step.

To sum up, models may be the only means of estimating a fair value for many trades on a bank's books. But different models can yield different revaluations for the same trade.<sup>4</sup> This is the basic reason why model-controls, in the broad sense, become necessary.

## 1.2 The varied uses and users of “Valuation” models at MS

To gain a feel for the varied uses and users of “Valuation” models, recall that these are the subset of models which: (i) are used for Marking the books; and/or (ii) feed the Firm's risk systems. That is, the model outputs include a price as well as a set of risk-sensitivities. The models are housed in a secure environment from which different user-groups (with appropriate permission/access rights) can access the models.

Traders use the models, at end of day, to mark their books and to “publish” their risk exposures, based on the risk-sensitivities.<sup>5</sup> The phrase “controller context” was frequently used.

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<sup>3</sup>E.g., the basic Black-Scholes model or the so-called “stochastic volatility” model.

<sup>4</sup>The term “model” here is used in an all-encompassing sense to include assumptions about the stochastic properties of the underlier(s); the computational procedures to carry out the calculations, and so on.

<sup>5</sup>Of course, they may also use the models to develop price-quotes, to analyze risk-management and hedging alternatives, etc.; but these do not impinge on the control aspects.

While I could not find a categorical definition, it seems to refer to agreed-upon methods for say, interpolation of yield curves, generation of volatility surfaces, and so on.<sup>6</sup> Hence, if the trader used a method outside the controller context, that could give rise to a discrepancy relative to the Controller’s Mark.

Controllers are responsible for Marking the books and are thus a key user-group of models.<sup>7</sup> Their use of models for this purpose is roughly along the lines described in subsection 1.1. Accordingly, it is a policy requirement that model documentation supply enough concrete, operational guidelines to enable controllers to do so—e.g., what market inputs to use.<sup>8</sup>

MRD uses the risk exposures (to which traders have signed off) as inputs to its VaR calculation.

## 2 General elements of the model control process—Policies

As outlined in the the document “Model Control Process“, dated March 3, 2005 and the presentation by P. Orban, the model control process is built around the following main elements:

- Documentation standards expected of model developers
- A model rating system and related processes
- Model review process
- Model inventory management
- Model change control processes

A brief description of each of these elements follows. More details can be found in the documents cited above. But first, we digress briefly to discuss MS’s distinction between Base and Product models.

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<sup>6</sup>The raw/input data for these calculations could come from external observations *or* be trader-supplied. “Context” restricts the calculation method, not the source of inputs.

<sup>7</sup>During the review, we developed a general idea of how Controllers use models for this function, as documented in other sections/memos (Mark Review; Valuation Adjustments; P&L explain). It is expected that we will have more detailed conversations concerning the mechanics in future reviews.

<sup>8</sup>Although, Controllers indicated that there is considerable room for improvement of documentation in this regard.

## **2.1 A digression: Base and Product models**

The term Base models seems to cover a broad range of ideas and implementations. On the one hand, it includes basic building blocks for Product models, including different methods of valuing payoff functions (quasi-analytical) or “simulating” underlier evolution—e.g., Monte Carlo or Finite Difference. On the other hand, models to calibrate parameters from market observables—e.g., yield curve inbootstrapping methods; volatility surface generators— are also included under this heading.

Product models define the way one or more base models may be used to value a particular product. It is the level that at which different financial instruments are distinguished.<sup>9</sup>

A Valuation model is a Base model paired with a Product model.

## **2.2 Documentation standards**

In addition to basic model description, types of inputs, etc., it is required that the scope and limitations of the model be clearly specified. Necessary information to conduct an effective Mark review must be included. The nature of model risk should be identified along with recommendations on model risk valuation adjustments. Models are expected to be subjected to extensive and varied testing, all of which have to be documented.

## **2.3 Model Ratings**

A 4-category, letter grade scheme (A through D) has been devised. The lower the rating the greater the restrictions/limits on the use of the model—the A-rated models are intended for extensive use, with no limitations. Guidelines are offered as to the meaning of each rating category.

## **2.4 Model Review**

Models are developed by the Business Unit’s Analytical Modelling section. They are first subject to a peer review within the Analytical Modelling group, assigned an initial rating, and a request

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<sup>9</sup>Page MS 15911 indicates that a product model can be mated with more than one base model, resulting in more than one valuation model for a product. BUT WHICH ONE WILL THE CONTROLLERS USE?

for a **New Model Approval (NMA)** i submitted. If a trade is executed, it is treated as C-rated. In the second stage, it goes through the NMA process, where it is reviewed by a larger group, comprising individuals from other areas, following which a BU rating is assigned. At this stage, model limitations and treatment of Day 1 P&L is proposed. Finally, MRD carries out an independent model review. MRD has the final say—it may reaffirm or reduce the BU rating. At each stage, the turnaround time is required to be 3 months or less. Models are also required to be re-authorized annually.

## **2.5 Model inventory management—monitoring**

Each division is required to organize a Model Control Group with predefined responsibilities. The primary responsibility is ensuring and certifying that the Model Database is complete, and help with the administration of Model Limits.<sup>10</sup>

## **2.6 Model change control processes**

A “regression testing” policy applies, requiring testing of model codes to determine if changes to valuations or risk numbers are as expected after any major production turnover.

## **2.7 Other control mechanisms**

Other control mechanisms worth noting are:

- C and B rated models may be subjected to documented model risk valuation adjustments.
- C models are not eligible for day 1 revenue recognition.
- The policy requires zero exposure to D rated models. They require approval on a trade-by-trade basis; are highlighted in reports.

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<sup>10</sup>The necessary tools are already automated in IED; in FID a spreadsheet system, requiring traders and controllers to certify models individually is used.

## 3 Model development and controls—implementation

### 3.1 IED

Rick Shypit, Global Head of Analytical Modelling (based in NY) gave us an overview of model development and model-controls within IED. The Analytical Modelling group consists of about 11 individuals in all, virtually all Ph.d's in technical fields. The group, also called QED, develops models, works with Risk Management and Trading to analyze trades. They are considered to be an independent research group, not dedicated to any particular desk. While retaining responsibility for all analytics, it works closely with IT/QPG (Quantitative Programming Group) to implement pricing models. The IED analytics library actually consists of two sub-libraries: the QED library of exotic derivatives and convertibles models, and the core QPG library (vanilla models, utility routines, etc.) However, both sub-libraries are subject to the same control processes and a seamless interface is presented to users.

Notably, QED staff themselves were said to produce production-ready code. An alternative approach is for model developers to deliver technical specifications to the group maintaining the production libraries, which then produces production-level executable code. This has the advantage of introducing an indirect test of “implementation accuracy”—i.e., developer code may contain errors (“bugs”) in translation of the mathematical specification to code. However, this concern is mitigated by the existence of other safeguards discussed below.

Model development in IED adheres to firm-wide development environment standards (MSDE). These types of standards are common in code and application development; important features include: procedures to ensure that the same source code, and hence the same analytics will be used across all users, regions, etc.<sup>11</sup>; progressive permissioning, regulating read-write access.<sup>12</sup> A Controlled Product Framework (CPF), whose centerpiece is the *QTree* concept, is employed.<sup>13</sup>

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<sup>11</sup>Production and test releases are all distributed the same way, namely on network drives—unlike, say, distribution of DLLs via e-mail which can lead to poor distribution control of releases.

<sup>12</sup>AFS (Andrew File System) uses tokens to ensure secure authentication.

<sup>13</sup>Details on *QTrees* can be found, e.g., at <http://www.qef.com/guide/pages/>. Here is an excerpt from their introduction: “QEF is a software toolkit and framework used by development teams to control their software constructions. It consists of approximately 214 programs that together provide a construction system, which combined with a version system, enables any developer to build any release of any software product on any machine at any time. Developers control all their builds with a single set of commands, regardless of platform,



QTrees include so-called Builder files which, very loosely speaking, facilitate getting input (Deal terms/contract information; market data; model-specific schedules, valuation methods; etc.) to the libraries, retrieving output from the libraries (valuation results), and archiving them. This is key to tracking model performance, and for “regression tests” during a version change, audit purposes, and so on. Practical benefits include the abilities to: book exotics trades without IT intervention; ease of applying user authentication; maintenance of an audit trail, etc. A good balance is struck between a flexible means of booking exotics trades, while maintaining control and transparency.

The New Model Approval Committee is the forum where a New Model receives its BU rating (the second stage of the model rating process). The Committee includes representatives from Analytical Modelling, BU Controllers, Valuation Risk Control (VRC), Divisional Risk Management, the Traders, and MRD. It meets weekly for discussing new models and reviewing approval status of previously-rated models. E.g. if a relatively low-rated model is bumping up against its notional limits, more resources (possibly including the AM/QED team) may be directed to “model improvement” so as to qualify for a higher rating. Discussions of Marking guidelines, valuation adjustments also take place here.

An extract from the presentation (MS 15977), reproduced here, sketches the “Life-stages of a Model.” A new Base model may take several weeks to months to be developed fully. It is said that the model is subjected to “complete” stress tests. Company IT/QPG then prepares it for delivery to Risk systems and subjects it to further testing. A Product model (in IED, aka Exec model) undergoes a Peer review with basic tests, including comparison with alternative pricing models. An initial rating is proposed, documentation and request for approval is submitted to the NMA; meanwhile a limited number of trades may be executed.

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development language or compilers. Many popular construction targets (program, library, debug, profile, install, release, etc.) are supported right out of the box; and you can customize QEF to support new constructions. QEF takes into account the complexities of the modern software development environment. It scales to small, medium, and large projects. The QEF toolkit can manage even the most complex software constructions, thousands of source files stored in hundreds of directories and spanning numerous platforms. With large software projects, QEF can save developer hours, which translates into many thousands of dollars. QEF provides a consistency that simplifies post-release maintenance. With the QEF toolkit, you can build all your software in a consistent way. No matter what the project, development language, platform, release or developer, a single set of commands builds the product.”

Samples of Base and Product model documentation were made available to us to illustrate how the documentation standards were being implemented. At some later date, it is expected that we will review these submissions and engage in further conversations with the bank, with a view to understanding: the choice of Base model, the tests performed, the scope and extent of model reviews (AM peer, NMA, MRD), rating assignment and tracking, reserves and mark review guidelines provided to controllers, and so on.

## 3.2 FID

Joe Langsam, Global Head, FID Analytical Modelling gave us an outline of model development within FID. and implementation of model control processes, FID is just commencing the task of implementing the model control processes. It also lags IED in terms of technological infrastructure. We discussed the the challenges facing FID. Some revolve around integration. FID is much larger and more diverse than IED, and model development has occurred separately and independently—a type of silo effect. Six different major booking/Front Office systems are in use. Much of the code has been, and continues to be, written in different programming languages—obviously a potential obstacle to achieving commonality and inter-operability. Others pertain to basic matters of systems and human resources and capabilities. Some of the models (e.g., IRD exotics) entail time-consuming simulations, a consideration in selection of system size and design. It was pointed out that certain types of instruments, while not difficult to price, pose difficulties for risk representation—MBS, converts, and exotic baskets were cited as examples.

At present, FID Analytical Modelling has about 50 staff members, distributed across business lines and geographically. External academic consultants are used extensively, a practice heartily endorsed and which was seen a very valuable partnership, bringing in new perspectives and ideas . But the entrenched structures are inherited and reorganization is contemplated. A desire was expressed for more individuals with expertise in high-performance computation (to develop better and faster algorithms), mathematical finance and core financial modelling. Groups dedicated to specific tasks/functions may be created—e.g., one for systems maintenance and operation; a tactical development and modelling group; enhancing the model control group.<sup>14</sup> In this regard,

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<sup>14</sup>The model control group at present functions mainly as a support group, ensuring that proper processes and procedures are being followed; sign-offs collected; maintenance of the model database, etc.

more staff are being hired in India to do specialized work—including testing and tool-building. For example, a commodity project was run in India, with a Principal Components Analysis carried out to parametrize a stochastic volatility model. In the FX area, a faster Basket Model was created.

He noted that these model enhancements do have tangible and observable impacts. For example, the introduction of the stochastic volatility model for commodities helped to eliminate the drift/bias and reduced the volatility previously observed in the “P&L Explain” analysis for this area.<sup>15</sup> He noted that he had requested NMA reviews for the commodities stochastic volatility model and compound options (options on options) model. New model requests generally arrive from all business lines. He mentioned for example that FX would like a stochastic volatility, rather than a local volatility, model. Credit trading and products are also prominent in this regard.

One noteworthy feature at FID is the use of a general-purpose 5-factor HJM model, calibrated to market data (caps/ floors, swaptions to capture the vol calendar patterns and perhaps some moneyness effects) that serves as the basic term structure model employed for pricing and risk measurement of all instruments. Hence, risks can be aggregated across traders, instruments, etc in an internally consistent manner.

### **3.3 Independent model review—MRD**

#### **3.3.1 Background**

Sections 3 and 9.5 of the Authorizing Guidelines (supplemented by sections V.A.6 and VIII.E of Risk Management Procedures) provide the mandate and authority for MRD to conduct independent reviews of BU-developed models. The Research Group within MRD is responsible for performing the model reviews. It is headed by Louis Scott and has a total of 6 full-time staff, supplemented by external (academic) consultants. Each staff member is dedicated to a product area (Credit, Equity, Commodities, IRC). The staff have Ph.D’s in technical fields, plus years of experience with model-building.

Guidelines for independent model reviews have been set forth (pp. MS 345-346). However, not all reviews have to cover every single point—there is the notion of short form and long form

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<sup>15</sup>The P&L explain process is described in other memos.

reviews. There do not be formulaic distinctions between the two, but would seem to flow from the “guiding philosophy” that takes into account the materiality of the positions being priced and whether the model is used for pricing or for risk management.<sup>16</sup> Additionally, while a written report is generally expected, it is not always required—another item we should follow up on later.

### 3.3.2 Review process

In full generality, a review is expected to go through a 9-point “checklist”. The list incorporates the major items one would expect in a thorough review. However, the expectation clearly is that the evaluation be based on BU-submitted documentation, rather than carrying out independent implementations and tests. The review culminates in MRD issuing the final model rating—which either reaffirms or alters the BU rating. Following the review, the group internally determines whether or not a formal written review is necessary. Unresolved issues, model rating downgrades would necessitate formal written reviews. When warranted, MRD will negotiate a set of agreed actions, people responsible, target dates, with the BUs and other relevant parties—this will be tracked. Reviews are archived in a database. MRD also tracks the model inventories which the Trading Divisions are required to maintain.<sup>17</sup>

We asked Louis to give us some illustrations of how some of the checklist items are interpreted in practice.

- He cited two examples of how the theoretical basis of a model was examined. The first was the CPPI trade, for which MRD initially felt that the Marking rule was rather crude because it ignored the possibility of jumps in the underlier. He priced the trade using his own model (Duffie-Pan-Singleton calibrated to the skew) and concluded that the Marking rule was acceptable. As a second example, Shypit recalled how a 23 parameter VGMSA model was found to deliver counter-intuitive results for down and out options compared to up and in options, and thus “failed” this test.

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<sup>16</sup>The wording here is slightly at odds with that in the Model Control Process document. Namely, the wording here raises the possibility that, for the same products, different models could be used for pricing and for calculation of risk exposures. We should get this clarified.

<sup>17</sup>As noted earlier, these databases are expected to include information on model ratings, limits and so on. While this is fully automated in IED, the process is still rather manual at FID.

- Calibration: The ability of a model to calibrate well to market observables was mentioned as a key determinant of a high rating. Once in production (i.e., past Stage I) Controllers maintain a history of a model’s calibration performance. Even though this may be a short history, it may still provide useful information. Louis indicated that calibration performance of new models varies quite a bit.
- Numerical methods: Louis recalled that he had once suggested an improved numerical integration technique.
- Model limitations: Models employing analytic approximation were said to be a leading cause of limitations being imposed.<sup>18</sup> In IED systems, model ratings and limits are part of the database, so that limitations are tracked automatically; whereas this is still a somewhat manual process at FID. Another fallback is the EOM Mark review, as part of which reports of variance by model rating are produced.
- Valuation adjustments (other than EITF 0203): Louis said that in some cases, markets are self-correcting, so that the valuation adjustments reverse themselves—this was the case with compound cliquets.
- Rating upgrade: In the case of oil options, after introduction of the stochastic volatility model, Louis supported the view that the model was sufficiently improved to merit a rating upgrade. This was supported by P&L explain results.

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<sup>18</sup>Analytic approximations have several desirable properties—they are extremely quick to compute, require minimal calibration, provides risk-sensitivities that are intuitive. Their main failing is that they can fail to pick up market realities (e.g., vol patterns with respect to moneyness and time-to-expiration)—hence, their use has to be limited in certain ways.

9. MF questions from the IRB on IRB's scenario model

Subject: Scenario values for the IRB's scenario model

10. In addition, the IRB's model sets up two data and creates and sets up input. As a result, the model is not fully defined.

11. What scenario data is the starting point of application of the IRB model at the deal level? Yes, but our judgement/default models are loan level models.

12. Starting at the deal level, the response might be as follows:

For a given IRB scenario, assume that the same IRB applies to all the individual loans in the deal - "Deal" - Yes, we are not certain here. The IRB model is applied down to the MSA level to account for housing market volatility.

-> How does any other important modeling assumptions? Not specifically.

As noted in the write-up, the IRB's scenario corresponds to a particular IRB path, which determines the CLETV rates of the underlying loan, and other functional specifications obtain the CLETV rates to default propensity and severity.

-> (think of a typical functional relationship would be helpful)

The CMR and severity are typically functional forms of the underlying drivers such as age, size, etc. CLETV, propensity, etc. CLETV is probably the most important one and directly linked to IRB path. To determine the CMR, we first calculate at each time step (monthly) the value for each underlying driver denoted by X, and then use it as an exponential form such as  $\exp(-\alpha X)$  to transform the underlying driver values to underlying severity/default rates. Then the CMR (1 -  $\alpha$ ) could be applied to the determination of severity and typically a linear transformation is used with boundaries.

Having generated the "score" and then, the calculated rates of the deal are modeled (generally, as 1) to figure out the cash flows to each security class for that IRB scenario? That's right.

-> What discount rate is applied to PV those cash flows-- is the Discount Margin rate, unless otherwise indicated?

Yes, in the scenario, zero discount margin over their curve was used for discounting.

-> The Cash Loss Figure are an individual values? Yes, they are scenario by scenario and individualized.

-> would the most granular IRB model perhaps incorporate a stochastic element to the IRB evolution?

Our mortgage modeling group is working on that.

3. Progressing to the ARX index

-> They always would be applied to each deal comprising the ARX.

-> Is a single scenario IRB applied to all component deals? Would it be important/desirable to apply a deal-specific IRB?

Yes, one single IRB model for all component deals. However, the payment/default models are loan level models, they take into account of geographic, distribution of underlying loans and their contribution to the IRB path.

3. Numerical Results

-> Do the Cash Loss and Cash Default Figure correspond to the collective "score" of the component deals of the ARX?

These numbers are really more about the underlying mortgage books when we use the IRB's model through the deal.

-> Are "high" or "low" based Rates of Return corresponding to the observed price and Cash Flow corresponding to the assumed IRB scenario?

[Hence, the possibility of negative yields when prices are "too high" relative to the scenario cash flow]

Yes, you can see that from the perspective. However, as we use different IRB scenarios, the negative yields are due to the losses when the index price is fixed, heavy loan scenario will generate low cash flow in the future. To compensate, one has to lower the DRM in order to peg up the price. At the best, you figure DRM can actually rise negative.

4. Calibration issues

-> Could applying different IRB's specific to each component deal of the ARX possibly alter the calibration "assumptions"? At a practical level, it would offer more parameters (degrees of freedom) for the calibration exercise.

Yes, a different IRB model for a different rate for example may be better. One also could use one IRB model but adjust different loan weights to IRB paths.

Another way around this would be using a stochastic IRB model where one could assign different probabilities to different IRB paths, and therefore a different default scenario in order to calibrate to the index.

-> Also, it seems the main conceptual concerns would be at the deal level--i.e., the common assumptions apply to all security classes.

distribution, common asset pool. But the model will have some deal. Our payment/default models are loan level models.

5. Check from the pipeline modeling section

-> Since the larger CMR from the two models is inherently used downstream, given the figure implied from the ARX is dominating?

We don't see implied numbers from ARX. We use the default model and pipeline modeling vectors parallelly through the underlying mortgage books and the CMR at any time in the run of time.

10. MF questions from the IRB on IRB's scenario model

Subject: Scenario values for the IRB's scenario model

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We don't see implied numbers from ARX. We use the default model and pipeline modeling vectors parallelly through the underlying mortgage books and the CMR at any time in the run of time.

MF questions from Kallie on Q1, week 10

MF and also Name May 2007, 2007.pdf

FC:

Re: MFC Issues

1. The issues are as described in the attached report I expect to you earlier today.

Q1 or Regression Testing

The backtests are based on specific market and transactions data and are done. This report is ready for use. The primary deal used today for the test is the one that the model being used today. The report will be used to compare the model being used today to the model being used today. The report will be used to compare the model being used today to the model being used today.

2. The test are specific to validation and not necessarily downstream based on some specific market data, which is used in the database. In particular, the test are based on the data that is used in the database. The test are based on the data that is used in the database. The test are based on the data that is used in the database.

3. Here is a sample list of regression changes that would typically occur in a regression.

Volatility Swap

Release Notes (2006-2007) Volatility is not off volatility

Issue: the test are not properly used and not properly done.

Release Notes (2006-2007)

Issue: the test are not properly used and not properly done.

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Release Notes (2006-2007)

Relevant Items (2007/06): Items to Read is not there to list any more

Model Review Status - your question regarding this dates my understanding, which may reflect the implementation of the... As of the date of the meeting with the Board in 2007, one of which was my early call... I am not sure if the Board is planning to... I will continue with James and Karl on the Structured Credit issues you raised in your email.

Agenda:

88 Deal - annual to Graham Kelly on our meeting & his date from Dec 17 meeting. 89 Deal - annual to Graham Kelly on our meeting & his date from Dec 17 meeting. 90 Deal - annual to Graham Kelly on our meeting & his date from Dec 17 meeting.

- 1. In the past, Steve Karz has been leading on the more detailed model reviews, commentary, model comparison or other analyses. We found these to be extremely useful, and would like to revisit them in part of the package next to us. (E.g., with respect to the most recent MFC minutes, my analysis relating to the RPA, Biomarkers, and the CMS Spread Index)
- 2. Perhaps you can let us know where it would be best to start our regular quarterly meeting (e.g., Feb - March?)

Q1 vs MFC Issues:

- 1. Would like to better understand the issues relating to "RPA Biomarkers and Regular Funding" and the CMS Spread Index.
- Q1 vs. Response Timing:
- 1. Benchmark and market data: Are the benchmarks called out for particular sectors? (e.g., non-issuer - state, non-callable parameters), trade prices (USD) particular market data (e.g., direct input - e.g., swap rates, used as calibration input, etc.)? (e.g., "control variables" if it is the "control" we would like to be against that called market data?) Or, do the "benchmark" model rates with respect to market data (e.g., direct input - e.g., swap rates, used as calibration input, etc.) control?
- 2. Scope of work: Are the comparisons based only on calibration and "local" risk sensitivities? Or, are extreme boundary values (of inputs, market data, etc.) also being (plugging in the future)?
- 3. For some of the benchmark scenarios, some background and narrative on what motivated the scenarios would be helpful. (e.g., Variance energy, basis, and others if your choosing)
- 4. Model Review Status: Is the display for the complete scenario (including strategies & asset FV) shown every time reviews are being done as in 2007?

Other topics:

- 1. Following reviews of possible modeling and price verification challenges (given the structured credit, we are arranging for a fully targeted discussion on these topics - risk management, price verification, etc.) - e.g., with James Bull and co-authors. To help us prepare, it would help us greatly if we could get model descriptions and an other ad hoc analyses for the relevant products. Plan of course, your commentary and insights.
- 2. Likewise, we have heard that trades have been needing to make adjustments to get the model prices to fit observed values. Again, model descriptions and details of the main issues would be much appreciated.

Re: portfolio review forthcoming Model Validation meeting. I thought it might be helpful to check again that (a) modeler's benefits can be more objective and approach in the area.

Essentially, we are looking to develop a working knowledge of the pricing models employed by the firm (which will help us better appreciate and understand model related issues arising from e.g., valuation/risk verification, and in measurement of market and credit costs), and a thorough understanding of the processes and mechanisms that contribute to "model control". Our primary objective for this purpose is the Independent Model Review, but we also identify "leverage" with model developers, contributors and internal audit. In working with the Model Review unit, we examine their model reviews (or other model documentation) and engage in close, ongoing dialogue (preferably plus follow-up on key findings). Examination of the model reviews helps us understand the technical components of the models, but also gives us insights into how model documentation and calibration practices work in practice. We also find modeling issues are actively discussed by various contributors, to be very useful in identifying "model control practices" - items from these minutes are our ongoing project for broader, detailed discussion.

Agenda:

% Meeting notes, Wed, June 20

% Meeting notes, Wed, June 20

% Meeting notes, Wed, June 20

- \* Mortgage models had not been reviewed (part of scope) by Model Validation. By Sep 2006, mortgage models were required to be validated under the policy, and a priority list was developed. They are sticking to that review schedule, despite disruptions in the marketplace and internal staffing. The priorities are viewed as consisting of: "core models" (segmented by "pragmatic checks").

The intent is to apply the same "review guidelines and principles" to mortgage models that derivatives models are subject to. The priority list helps the Model Validation catch up with the backlog - over a period of about 2 years - and then move to proactive pre-approval process of newly developed models.

Agenda: Model Review:

\* Review team: (including Internal Audit) will be reviewing the model. It will verify the model code for implementing the MFC models to be used for the review. \* Main recommendations to EAST - the MFC Pricing Piece Index is an important input to model valuation and should be explicitly modeled. The review contains some suggestions along these lines.

Comments by EAST and Product Line Risk Manager:

\* The suggestion for model review controls backlog for re-implementation by EAST and Risk Manager concerning the review. These are almost always both. Dialogue does take place - e.g., in the form of pre-meetings, rather than written, but has not been translated to written dialogue. This plan to explore these somewhat more formally in the future.

Read Back to Boarding:

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1. Introduction  
2. Background  
3. Methodology  
4. Results  
5. Discussion  
6. Conclusion

1.1. Overview  
1.2. Objectives  
1.3. Scope

2.1. Context  
2.2. Literature Review  
2.3. Theoretical Framework

3.1. Research Design  
3.2. Data Collection  
3.3. Data Analysis

4.1. Key Findings  
4.2. Statistical Analysis  
4.3. Interpretation

5.1. Implications  
5.2. Limitations  
5.3. Future Research

6.1. Summary  
6.2. Recommendations

1. The purpose of this document is to provide information on the status of the project. This document is intended for the use of the project manager and the project team. It is not to be distributed outside the project team.

2. The project manager is responsible for the overall management of the project. This includes the development of the project plan, the assignment of resources, and the monitoring of progress. The project manager is also responsible for the communication of project information to the project team and to other stakeholders.

3. The project team is responsible for the execution of the project plan. This includes the completion of tasks, the reporting of progress, and the identification of problems. The project team is also responsible for the maintenance of project records and the communication of project information to the project manager and to other stakeholders.

4. The project plan is the document that describes the scope, schedule, and resources of the project. It is the primary tool used by the project manager to manage the project. The project plan is developed in consultation with the project team and other stakeholders.

5. The project schedule is the document that describes the timing of the project. It is the primary tool used by the project manager to monitor progress and to identify potential problems. The project schedule is developed in consultation with the project team and other stakeholders.

6. The project resources are the people, equipment, and materials that are used to complete the project. The project manager is responsible for the assignment of resources to the project and for the monitoring of resource usage. The project manager is also responsible for the identification of resource needs and for the procurement of resources.

7. The project communication is the process of sharing information about the project with the project team and other stakeholders. This includes the development of project reports, the holding of project meetings, and the use of other communication tools. The project manager is responsible for the overall management of project communication.

8. The project records are the documents and other information that are generated during the project. These records are used to track project progress and to provide a historical record of the project. The project manager is responsible for the maintenance of project records and for the communication of project information to the project team and to other stakeholders.

9. The project problems are the issues that arise during the project that prevent the project from progressing as planned. The project manager is responsible for the identification of project problems and for the development of solutions. The project manager is also responsible for the communication of project problems to the project team and to other stakeholders.

10. The project success is the achievement of the project objectives. This is the ultimate goal of the project. The project manager is responsible for the overall management of the project and for the achievement of project success. The project manager is also responsible for the communication of project success to the project team and to other stakeholders.







**Subject:** VaR section for report

**Date:** December 22, 2005

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This section provides an overview, and general background, of the VaR methodology at BS. A companion document provides substantially more detail and discussion of the VaR components.

In our judgment, the bank's VaR methodology is generally adequate and within the mainstream/range of industry practices. The basic framework is quite similar to that employed at many peer firms. The analytical and statistical components are generally based on clear and straightforward theoretical principles. The firm employs a broad range of risk factors—the set of general market factors is similar to that at other firms and a wide set of residual risks are captured. The revaluation approaches are also quite standard.

In the course of our review, we have also identified several implementation aspects and details for future review. For some of these, we expect to recommend that the bank carry out sensitivity and additional empirical analyses to assess their impact on measured VaR. [In this draft, these recommendations are described in the companion document, and in the attachments listed under “Follow-Up” items.]

## 1 VaR at BS—General Background

### 1.1 Organization, responsibilities, etc.

Market risk measurement is a collaborative effort, principally between personnel from the Financial Analytics and Structured Transactions (FAST) group, the Risk Management Department (RMD) and Information Technology (IT).<sup>1</sup> FAST personnel have executed (and will continue to oversee) the overall design and architecture, as well as the “nuts and bolts” analytics and technical specifications of the VaR system. Risk Monitors/Managers, members of RMD, work in concert with FAST personnel to ensure that the VaR specifications remain properly aligned with the firm's books (e.g., complex trades are represented properly in VaR) and current market realities (e.g., changes in market conventions, changes in empirical properties (parameter updates),

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<sup>1</sup>Four individuals from FAST and six from IT are dedicated to market risk measurement projects.

updated mapping of instruments to risk factors, etc.)<sup>2</sup> The IT group has created a platform, RIO (Risk Information Organized) to run the risk models, create various reports and deliver them via the RIO interface through the firm.

While the collaborative process appears to have worked reasonably well, the roles and responsibilities appear to be somewhat loosely defined. OPSRA staff feel that more precise delineation and formalization of roles and responsibilities would be desirable.<sup>3</sup>

## 1.2 History and evolution of VaR at BS

The current VaR system is the product, in response to internal and external imperatives, of a concerted effort to have in place a firm-wide view of market risk.<sup>4</sup> Prior to that, most derivatives desks already had their own, customized VaR-like methods. The challenge for FAST was to integrate the different approaches so as to fashion a reasonably consistent and uniform methodology, while respecting the unique/diverse needs of each/different desks.<sup>5</sup> The FAST team opted to use Historical Simulation (hereafter, HistSim) as the core approach, which they believed could more easily accommodate the nuanced requirements of different desks. The modelling of specific risks and aggregation would be done at the “top”, i.e., outside the HistSim framework. In the process, some desk-approaches were totally revamped while others were only modified in minor ways.

## 1.3 Future plans

FAST personnel outlined, *in very informal terms (i.e., no timetables)* their general plans and priorities re: the VaR system. One goal is to “harmonize” treatment of a product across desks—e.g., the risk of a given swap should be the same whether viewed by FID or by the mortgage desk—at present, they can differ because of different risk factors (maturities used in risk factor estimation, etc.) With the passage of time, the bank has accumulated more data, and plans

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<sup>2</sup>Other functions performed by Risk Managers vis-à-vis VaR are discussed elsewhere in the report.

<sup>3</sup>E.g., at present, neither the “primary ownership” of, nor the process for, changing/modifying a risk factor seem to be clearly established. Likewise, no one group has yet been given clear responsibility for documenting the implementation details of the VaR system.

<sup>4</sup>The “LTCM crisis”, impending CSE requirements were among the stimuli cited.

<sup>5</sup>The Fixed Income division was much more concerned about incorporating lots of tenors and maturities, whereas for the Mortgage desk far fewer yield curve points are required.

to carry out extensive re-estimations—primarily for specific risk parameters. Moreover, data quality has also been improving for some products (e.g., credit derivatives) possibly warranting a re-estimation in those areas. On a more general note, the “educational” process re: VaR continues.

## 2 A brief digression: basics of VaR

The basic purpose of a VaR system is to produce a (probability) distribution of possible portfolio values (or changes thereof)  $k$ -days (e.g.,  $k = 1$ , or  $k = 5$ ) ahead.<sup>6</sup> Typically, this is accomplished in three generic steps<sup>7</sup>: (i) scenario generation<sup>8</sup>—generating the distribution of possible *joint* outcomes of the underliers or risk factors that instrument/position values (or changes thereof) depend on; (ii) revaluation—revaluing each instrument/position in the portfolio at each simulated scenario/joint outcome; and (iii) value or P&L distribution—for each scenario, summing up all the instruments’ values (changes) yields the portfolio value/change for that scenario; sorting the portfolio/value changes yields the P&L forecast distribution, from which target quantiles can be selected.

Three approaches are commonly in use, often one in conjunction with another—i.e., the approaches are not mutually exclusive. These have acquired the labels: (i) Historical Simulation, (ii) Monte Carlo (“MC”), and (iii) Variance-Covariance (“V-COV”). HistSim and Monte Carlo are actually just methods of scenario generation—step (i) above—and place no constraints on how steps (ii) and (iii) are carried out. With V-COV, such a clean separation is generally not possible. Institutions with large, diverse portfolios nowadays generally use HistSim as the core approach, supplemented by MC, or less commonly, by V-COV. One reason for the popularity of HistSim is that it is nonparametric—no (explicit) assumptions regarding the risk factors’ statistical distribution or parameters are required. The other two methods, in contrast, are parametric—they do require such statistical assumptions.

Under the HistSim approach, histories of past joint outcomes of the risk factors are assembled—

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<sup>6</sup>I.e., the distribution specifies the possible portfolio values as well as the likelihood/probability of each value.

<sup>7</sup>True for Historical Simulation and Monte Carlo Simulation, but not for the Variance-Covariance method.

<sup>8</sup>Not to be confused with the other common use of this term to refer to a predefined set of joint outcomes for the risk factors.

successive observations could be at daily or weekly intervals, for example. Scenarios are generated by making random draws from the history, by assuming that each historical observation is equally likely<sup>9</sup> to recur over the VaR-horizon—i.e., the next day or week.

Clearly, HistSim is best suited for risk factors for which high-quality (reliable, long histories) data are available. This criterion is usually satisfied by most of the important “general market”/systematic risk factors (e.g., Treasury and swap curves, FX rates), but also by certain issuer-specific factors—e.g., stock prices.

Under the parametric approach, key statistical parameters—the mean, standard deviation and possibly correlations—of a risk factor are first estimated either subjectively, or using whatever (possibly limited) data are available. It is also assumed that the risk factor follows a familiar distribution—the Normal assumption is by far the most common, although the  $t$ -distribution is also used occasionally.

Discussion of approaches to revaluation and aggregation (steps (ii) and (iii)) is subsumed under discussion (to follow) of the bank’s approaches to these steps.

### 3 Overview of BS’ VaR Methodology

#### 3.1 Scenario generation

BS employs HistSim scenario generation for most systematic risk factors as well as for equity returns (where available). At present, the bank has about three and a half years’ of data for most of the series—the target is to be running VaR on four years of prior history. The data are for weekly, rather than daily, observations, in line with BS’ standard of one-week VaR horizon.<sup>10</sup>

The bank also employs the parametric approach, chiefly for idiosyncratic or residual risks. Roughly speaking, these are security-specific risks or risks (variations in instruments’ prices) not explained by the systematic factors. In all cases, the factors underlying these risks are assumed to be Normally distributed and all correlations are assumed to be zero. Of course, P&Ls from

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<sup>9</sup>If desired, different weights can be assigned to each historical observation. One popular variant is to weight recent observations more heavily (this is called “exponential weighting”).

<sup>10</sup>Arguably, the appropriate VaR horizon is different across desks, dependent, e.g., on the time required to hedge or defease risks, the expected holding period, etc. For many derivatives desks, a one-week horizon might be too long.

different positions exposed to a particular factor are assumed to be perfectly correlated (e.g., issuer-specific P&L for all bonds of a firm).

For certain risk factors with insufficient histories, *proxying* is employed. Exploiting the risk factor’s putative relationship with an HistSim risk factor, either synthetic histories are generated or parametric properties are estimated.

More detailed discussion of risk factors used by BS can be found under the heading “Salient VaR features by product area.”

## 3.2 Revaluation

For some basic products such as cash equities, the reval follows more or less directly from the factor change. For more complex products, alternate revaluation schemes become necessary. As a general rule, positions are not subject to “full” revaluation at *every* simulated scenario, because of the computational cost. Instead, computationally less-burdensome approaches are adopted. Under any approach, however, the actual calculations are done by Front Office systems and supplied to the VaR system.

One approach is to use (approximate) revaluation schemes based on “risk sensitivities” are used.<sup>11</sup> These are analogs of analytic partial derivatives—namely “Greeks”, PV01’s, and the like. Being “local” risk measures, these should perform quite well for “near-linear” instruments<sup>12</sup> and may be acceptable for options that are “monotonic”<sup>13</sup>

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<sup>11</sup>A simple example is how a straight bond might be revalued. Under “full” revaluation, each individual cash flow of the bond would be repriced (discounted) at the appropriate simulated rate—and this has to be done for each simulation scenario. Under approximate revaluation, first, the bond’s PV01 is calculated—this is the change in the bond’s value if the current yield curve underwent a parallel upward shift of 1bp. (This is one, and not the only, way of calculating PV01. It is obviously very closely related to the *duration* measure.) Then, for all simulation scenarios, the bond’s change in value is approximated as the PV01 times the simulated change in the yield—considerably fewer calculations than full repricing. For option-like instruments, the so-called Greeks are used for this purpose.

<sup>12</sup>For a linear instrument, the change in value is effectively a simple, *constant* multiple of the change in the risk factor. The crucial aspect is that the multiplier to be applied is more or less constant across the range of risk factor values. For a nonlinear instrument, applying such a constant multiple results in a poor approximation, relative to full revaluation, at larger values of factor changes. Adding higher-order sensitivities alleviates but does not cure the problem.

<sup>13</sup>The directional impact of a factor change determines whether or not an instrument is monotonic. An instrument

Another approach is to use revaluation grids (usually 2-dimensional). The grid is a table of instrument values, obtained by applying full revaluation, at selected values of each underlier/dimension. Inter- and extra-polation are then used to estimate instrument values at other values of the underliers. BS uses these grids, for example, for equity derivatives, with the stock price and implied volatility as the two dimensions.<sup>14</sup>

### 3.3 Aggregation

It is straightforward to compute a position's value (or value-change) for each HistSim scenario—by multiplying factor sensitivities by risk factor changes or by looking up the reval grids, as appropriate. For a given HistSim scenario, simply adding up the P&Ls for all positions gives the aggregate, portfolio P&L for that HistSim scenario. Repeating this for all HistSim scenarios (i.e., for all historical dates) yields an aggregate P&L HistSim series. Treating gains as negative losses, and sorting the P&L *losses* from lowest to highest, the 95th percentile of the sorted distribution is the estimated HistSim VaR (at the 95th percentile). Note that this aggregation exercise can be carried out any desired level—desk, division, firm-wide, etc.

The bank combines this with the P&L “risk” arising from the parametric risk factors by using what may be called a parametric approach. The bank assumes that the HistSim P&L and the parametric-risk P&L(s) are draws from independent Normals with different variances. The combined variance is then just the sum of the individual variances, and the combined VaR is just 1.65 times the combined standard deviation.

## 4 Assessing the VaR system

There are four broad dimensions along which the output quality of a VaR system can be evaluated:

(i) integrity/quality of input position data; (ii) quality of scenario generation; (iii) quality of

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is monotonic, e.g., if its value always increases as the risk factor decreases, over the whole range of risk factor values.

A noncallable bond is a simple example of a monotonic instrument. At any yield level, its value always decreases (increases) as its market-required yield rises (falls). In contrast, a callable bond behaves like a noncallable bond over a range of yield levels, but changes character below a certain yield level, as it becomes more likely that the bond will be “called.” Many derivatives with complex payoffs are typically not monotonic.

<sup>14</sup>A 2-dimensional grid captures the “cross-partial” effect—the instrument's change in value for a given change in the stock price also depends on the concurrent change in implied volatility.

revaluations; and (iv) quality of aggregations. These are also the main channels through which “inaccuracies/errors” can creep into a VaR system.

The companion document highlights, desk by desk, areas where the qualities of scenario generation and/or revaluation deserve further discussion/analysis.<sup>15</sup> Here, we note certain issues with the bank’s approach to aggregation.

One of the strengths of the HistSim approach is its nonparametric nature. In the aggregation stage, however, the bank’s calculations rest entirely on parametric arguments. E.g., the bank assumes: (i) that the P&L due to HistSim factors is Normally distributed, and (ii) that the “combined” P&L is also Normally distributed. If the actual distributions were fatter-tailed than the Normal, the measured VaR would understate the “true” VaR. We will discuss this point further with the bank.

## 5 Salient VaR features by product area

To gain a better appreciation for the bank’s VaR system, this section highlights how principal risks for different product types are addressed.

### 5.1 Credit Products

The principal risk for credit products is due to spread changes. A security’s spread change is assumed to be driven by: (i) the change in a rating/industry index spread, (ii) the change in an issuer-specific “average spread”<sup>16</sup>, and (iii) issuer-specific term structure effects<sup>17</sup>. The first is captured via HistSim and the last two via parametric add-on, with different types of assumed inter-correlations. This general approach is applied (with some tweaks) to a wide array of products exposed to issuer-credit-risk, including corporate bonds (other than those already in default), emerging market bonds, credit derivatives and municipal bonds. Additionally, for defaulted debt and credit derivatives, risk due to changes in anticipated recovery are also considered.

P&L’s stemming from HistSim risk factors are aggregated in the “natural” way. P&L from the non-HistSim factors are “added in” via the parametric approach with different types of assumed

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<sup>15</sup>Assessing quality of input position data is generally outside OPSRA’s purview.

<sup>16</sup>Average across all issues for that issuer.

<sup>17</sup>Maturity-specific deviations relative to the issuer’s average spread.



inter-correlations. Thus, for the  $i$ 'th issuer, all sources of issuer-specific “residual volatility” are added up (i.e., they are perfectly positively correlated). Maturity-specific risks are correlated within an issuer but uncorrelated with the “residual volatility” above.

### 5.1.1 Noteworthy items

#### Restructuring risk

The bank also accounts for “restructuring” risk which stems from the fact that credit default swaps on the same issuer may differ as to the set of credit events under which they pay off—in particular, some CDS's do, and some do not, recognize “corporate restructuring” as a credit event. The bank uses the CDS of one type of provision (e.g., Modified Restructuring for North American investment grade names) as a VaR benchmark, and hence CDS's with alternate provisions would carry a “basis risk,” which is captured in VaR.

#### Correlation risk for synthetic CDOs

The values of a CDO's tranches change as the market revises its views on the distribution of the overall future default rate of the CDO's reference asset pool. It has become common practice to model the distribution of the overall default rate via a so-called correlation parameter (a higher correlation means greater uncertainty about the future default rate—i.e., higher probabilities of more extreme (very high *or* very low) default rates). Although the correlation parameter is not directly observed or directly traded, it is possible, under certain assumptions, to compute implied correlations from prices of actively traded standardized tranches—these are the so-called base correlations. The bank has compiled a 2-year history of weekly observations on base correlations of each of 5 tranches of 18 different indices—these are the standard, actively-traded tranches. Tranches of custom or bespoke CDOs are mapped to one or more of these standard tranches.<sup>18</sup> Sensitivities of the tranches to base correlations are supplied by the desk. This “correlation-risk” contribution to VaR is assumed to be statistically independent of other VaR contributions for aggregation purposes.

It should be noted that this is an area with relatively high “model risk”—models are relatively

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<sup>18</sup>For standard tranches with insufficient history, there is a fallback procedure. This should become less important as time passes and better historical data is accumulated.

immature and are being fine-tuned. BS and other institutions are studying the behavior and performance of alternative models. We have flagged several specific items for further review and will also be keeping abreast of industry-wide developments.

## 5.2 Interest rate products

Products in this desk face exposure to changes in yields/rates across the spectrum of maturities. The bank employs a factor-model to estimate interest rate risks that are “common/systematic” across the maturity spectrum, which are then represented as HistSim factors. Interest-rate related risks (of individual securities) that are security-specific or non-systematic are captured via parametric (non-HistSim) methods. A single, HistSim, implied volatility risk factor is also used.

This approach is applied to government bonds desk and the fixed income derivatives desk.

## 5.3 Mortgage products

A 5-factor model is used to estimate the systematic components of interest-rate changes, and to develop associated HistSim risk factors. Changes in the “mortgage basis” (which encapsulates the refinancing incentive) are decomposed into a “systematic” and a “residual” component. The systematic component, due to the systematic IR changes alone, is determined internally within the bank’s pricing model—as such there is no explicit risk factor for this component. The residual component is the variation in the mortgage basis not explained by changes in Treasury and swap rates, for which a HistSim factor is used.<sup>19</sup> It is worth noting that, across institutions, a variety of approaches are used for “mortgage VaR”; BS’ implementation has some innovative aspects.

The above approach to interest rate risk is applied to all residential mortgages.

### Residual risks for residential mortgages

The starting point is a bank-developed model, with the acronym PORC, that is used for valuation and risk analyses of residential mortgages.<sup>20</sup> Residual risks are estimated by examining

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<sup>19</sup>A single implied volatility factor is used—the 1-year option on the 10-year swap rate.

<sup>20</sup>Inputs to the model include Treasury and swap curves and implied volatilities for points on those curves. The residual term of the mortgage basis is also an input. As already noted, the systematic component of the mortgage basis (current coupon on 30-year fixed less the 10-year swap rate), is derived from the swap and Treasury rates HistSim risk factors.

the unexplained price-variation, relative to the PORC model, of different types of mortgage instruments. The actual estimation and aggregation of residual risks are quite elaborate and described in greater detail in the companion document.

Estimation is carried out only for agency securities. Residual risks for jumbo primes and Alt-A's are parametrized by agency "residual-risk" standard deviations, inflated by 10%—this is to account for their observed higher residual price-volatility, relative to agencies. For prime and Alt-A ARMs, "residual-risk" standard deviations that are 50% of those applicable to fixed-rate non-agencies, are used.

Subprimes are believed to behave differently than mortgages of higher credit-quality in at least two respects: (i) they exhibit low interest-rate related prepayment sensitivity, but (ii) are sensitive to credit perceptions. Accordingly, the residual risk approach is more akin to that of credit products. The bank first estimates "cash-flow" or "zero-volatility" spreads and durations for each position. Via empirical estimation, the volatility of the cash-flow spreads is divided into two components, a market-wide component common to all positions and an issuer-specific component based on the loan originator.

For scenario generation and aggregation, both the market-wide component and the originator-specific component are handled via the parametric approach. Each security or whole loan is mapped to a particular issuer. All risks attributable to a particular issuer/originator are assumed to be perfectly correlated. P&L variations from the market-wide component are assumed to be perfectly correlated across all (subprime) positions, but uncorrelated with the originator-specific variation.

### Commercial mortgages

Products include whole loans held for securitization as well as secondary market securities (tranches of previously issued CMBS). These products are subject to both interest rate risk and credit risk.

HistSim risk factors for commercial mortgage-backed securities (CMBS) include: (i) interest rate changes— weekly changes on USD CMT (Constant Maturity Treasury) rates for five different maturities,<sup>21</sup> and (ii) changes in the spreads of CMBS indices of different ratings—4

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<sup>21</sup>Unlike residential mortgages, commercial mortgages contain provisions preventing or severely discouraging prepayments by borrowers (e.g., an extended *lockout* periods of 10 years). So a CMBS essentially behaves like an

investment grade CMBS categories, 2 sub-investment grade and one IO. These spreads are viewed as “systematic” credit-risk indicators. The bank believes that deal-specific credit risk is minimal, and hence no attempt is made to capture it.

Each whole loan position awaiting securitization is tranching in the same proportions as the most recent deal, whereby the above treatment for CMBS securities can be applied.<sup>22</sup>

### ABS & CDOs

Interest rate data on USD CMT rates for 5 different terms are used. Each bond is mapped into one of the 5 terms based on expected life; floaters are mapped into the shortest bucket.

Spread data are collected for these ABS categories: auto, credit card, home equity, manufactured housing, high LTV loans and student loans. For CDOs, spread data on high yield bonds, high yield loans and asset-backed securities are collected. Spread indices are further broken down by rating categories, fixed/floating (for some products) and seasoning. These capture the broad market components of these instruments’ credit risk. Each bond is mapped into a spread bucket based on tranche type.

Bond-specific credit risk components are also calculated using the same approach and parameters as for corporate bonds. Assuming equivalence of ratings to the corporate bond scale, the specific risk volatility associated with a corporate rating is applied.

## 5.4 Equity and Equity Derivatives

The principal risk factors relate to movements in stock prices (single-name and indices) and in the term structures of implied volatility. For the price-levels of equities, the preferred HistSim factor is name-specific weekly return histories. When such historical data are insufficient or unavailable, proxies are developed using procedures described subsequently. To the extent possible, name-specific implied volatility term structures are also fed as HistSim factors.

Where computationally feasible, revaluation grids/matrices are used to capture the nonlinearities *and* the cross-partials inherent in option positions.

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ordinary noncallable bond with respect to changes in default-free interest rates.

<sup>22</sup>However, tranches below B are assigned the credit risk of the B-tranche. The very junior tranches tend to be very small portions of the overall transaction, and the bank has also indicated that they tend not to retain these pieces.

The bank captures the market risk of positions in the Risk Arbitrage desk as follows. The principal source of market risk is whether or not there is a deal-break risk over the VaR-horizon (e.g., 1 week). If the deal breaks, the loss is estimated by assuming that *Target*'s stock price reverts to its pre-announcement level. If there is no deal-break over the next VaR-period, the market may revise its estimate of  $p$ , resulting in a change of the "spread" between the Offer price and the *Target*'s current stock price—with attendant changes in portfolio value. The volatility of this spread is estimated from an historical database (internal to BS). Using a deal's current implied deal-break probability, a separate simulation generates events of deal-break and "no deal-break"; appropriate valuations (i.e., based on spread-volatility for the no deal-break case and from the price-reversion for the deal-break case) are then applied.

## 5.5 FX Positions

The bank trades cash and derivatives FX instruments. The principal risk sources are changes in FX rates and in implied volatilities, with changes in interest rates being of secondary importance. Each of these risk sources has HistSim risk factors. Where implied volatility histories are lacking, a proxy history is created by using the realized standard deviation of the FX rate over the prior three months. For derivatives, revaluation is accomplished via a grid, with the FX rate and the implied volatility as the two dimensions.

**Subject:** Companion document on Bear Stearns' VaR

**Date:** December 22, 2005

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## 1 Credit Products

The bank's inventory includes a range of products whose principal risk arises from changes in the credit-quality of "issuers" such corporates, sovereigns, municipalities, etc. The product suite includes high grade bonds, high yield bonds, emerging market bonds, convertibles, munis (bonds), and credit derivatives. These products are managed under separate desks/WhiteBook, mirrored in the discussion here.<sup>1</sup> The opening subsection provides a discussion of VaR-features that are more or less common across the desks (in this broad product area), and also serves as an overview and summary. Aspects unique to particular desks are covered at the appropriate juncture.

### 1.1 Common elements of credit-products VaR

#### 1.1.1 Overview

##### Risk factors

Broadly speaking, the principal relevant sources of risk are interest rate risk and credit-related risk. Interest rate risk factors are based off a default-free curve (e.g., US Treasury) or, if more appropriate, a swap curve. On the credit front, value changes due to spread changes and to changes in anticipated recovery are treated as distinct (and distinguishable) components.<sup>2</sup> Furthermore, a particular security's spread change is assumed to be driven by: (i) the change in a rating/industry index spread, (ii) the change in an issuer-specific "average spread"<sup>3</sup>, and

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<sup>1</sup>It appears that only linear products are booked here; products with optionality are elsewhere—e.g., Muni derivatives are in FID.

<sup>2</sup>The distinguishability problem...Credit spreads are observable; conceptually, however, they reflect other, more fundamental, unobservable, forces—such as anticipated default probabilities and recovery rates, liquidity and risk premiums, etc.

<sup>3</sup>Average across all issues for that issuer.

(iii) issuer-specific term structure effects. The first is captured via HistSim and the last two via parametric add-on, with different types of assumed inter-correlations.

### Revals

Position sensitivities, in the form of effective durations, are supplied from Front Office systems. Separate sensitivities/durations are supplied for interest rate factors and for the credit-factors. Only first-order sensitivities are considered (e.g., convexity terms are not used).

### Aggregation

P&L's stemming from HistSim risk factors are aggregated in the "natural" way. P&L from the non-HistSim factors are "added in" via the parametric approach with different types of assumed inter-correlations. Thus, for the  $i$ 'th issuer, all sources of issuer-specific "residual volatility" are added up (i.e., they are perfectly positively correlated). Maturity-specific risks are correlated within an issuer but orthogonal to the "residual volatility" above.

## **1.1.2 Some salient details**

### HistSim components

For interest rate (IR) risk, bonds are placed into 5 maturity buckets based on expected remaining life. Historical data on par CMT yields for these 5 maturities are then the IR risk factors. IR durations are based on 25bp up and down shifts in the selected yield.

Risk factors for credit risk are developed as follows. Each security is mapped to an appropriate industry—rating bucket. For each bucket, an index has been created by BS Research (this is also externally published), for which historical time series data are available.<sup>4</sup> Historical percentage moves in the index spread are applied to the current OAS of the security,<sup>5</sup> which multiplied by the security's spread duration gives the associated price-change.

The price-impacts arising from IR changes and from the HistSim component of credit (as

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<sup>4</sup>Weekly interest rate and spread changes are used. IR data on 8 ccy's and 5 tenors. Spread data: 12 industries and 3 rating buckets (AAA through AA-, A+ through A-, and BBB+ through BBB-). Additional 12 industries for high yield, so grand total of 48 corporate bond indices.

<sup>5</sup>Thus, securities with higher OAS experience a large basis point change in spread. However, the transformation is not exactly linear, and a cap is also applied.

above) are added together, which is the HistSim P&L vector for Credit Products.

#### Details—Issuer-specific component

The goal is to estimate the “typical” issuer-specific idiosyncratic (relative to the index) spread volatility. For each industry-rating bucket, for a sample of individual bonds, time-series regressions are run for each bond,<sup>6</sup> regressing each firm’s percentage change in spread on the percentage change in the index spread. Denote the average residual standard deviation (across all the sample bonds) in industry  $I$  and rating  $J$  by  $\bar{\sigma}_{I,J}$ . Then, the the standard deviation of the  $i$ ’th bond’s price-change is given by

$$\sigma_i^{\Delta P, Issuer} = D_{is} \frac{\bar{\sigma}_{I,J}}{100} S_i$$

, where  $D_{is}$  is the spread duration of the  $i$ ’th bond and  $S_i$  is the  $i$ ’th bond’s current OAS.

#### Details—Security-specific (maturity) component

The bank also seeks to measure security-specific variation arising purely from maturity differences.<sup>7</sup> In the bank’s setup, maturity-related differences can enter in two ways: (i) a non-flat credit curve, so that the Spread level (which is a multiplier) differs by maturity, and (ii) imperfect correlation of spread changes by maturity. The credit curve is divided into eight maturity buckets (namely?) and histories of CDS data are used.<sup>8</sup> For issuer  $i$ , let the mean CDS spread change (what about mod-R, etc.), over all 8 maturities, for day  $t$  be  $\Delta \bar{s}_{it}$ . For each maturity bucket, the time-series regression  $\Delta s_{ijt} = b_{ij} \Delta \bar{s}_{it} + \epsilon_{ijt}$ . Given the estimated  $b$ ’s and the covariance matrix of the  $\epsilon_{ij}$ . (for given  $i$ ), the variance in price-change due to maturity effects can be calculated.

### 1.1.3 Issues, Follow-ups, etc.

1. Are bonds with potentially stale ratings mapped differently?

Ans: Bank acknowledged the problem. Use of percentage (rather than “level”) spread

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<sup>6</sup>Is the sample representative of the actual portfolio —e.g., could be tilted towards the more actively traded bonds, with more historical data? If daily regressions, lagged adjustment. Frequency of parameter update?

<sup>7</sup>Other types of security-specific variations are not—e.g., seniority, security, etc. Some such features *may* be partly captured via rating differences (depends on whether the rating is meant to reflect obligor default probability or expected loss).

<sup>8</sup>Bond data is not clean enough to estimate maturity effects. Only CDS data are available. Bank believes that maturity effects should be similar across bonds and CDS’s.



shocks possibly mitigates the problem somewhat—but the more serious point is that the shocks are taken from the stale rating bucket; and these properties are different across rating buckets (e.g., lower volatility in higher-rated both for indices and specific risk). RECOMMENDATION: sensitivity analysis; or manual rating override.

2. Regarding equation 7 (p. 14). The  $b_i$  is implicitly assumed to be unity when assigning the “general-market-change” of a security’s spread change. Correct? If yes, to be consistent, it might be preferable to estimate the “independent volatility” via  $\hat{\epsilon}_{it} = \Delta s_{it} - \Delta s_{It}$   
Bank agreed. Probably a minor issue. Also, the index itself is value-weighted. However, the average of the estimated  $\beta$ ’s is used (in that sense, equally-weighted) for the  $\hat{\epsilon}$  calculations.
3. How representative is the estimation sample of the typical portfolio held by the bank?  
Ans: No definite stats. (Issue is possible selection bias—estimation sample must have enough historical data, which may tend to be biased towards survivors, more liquid, less volatile, etc. RECOMMENDATION: assess this numerically. Number proxied etc. Bank indicated that about one-quarter of the portfolio would have fewer than 2 years of data, and hence would not be in the estimation sample Plan is to update parameters every 6 months or so.
4. ☛ What is the “correlation” treatment of bonds of same issuer but in different rating buckets (e.g., because of different seniority, security, etc.)

## 1.2 High Grade Bonds

Bonds rated AAA through BBB– fall under this desk. Index spread data on 12 industries and 3 rating buckets (AAA through AA–, A+ through A–, and BBB+ through BBB–) are used as the HistSim risk factors.

## 1.3 High yield bonds

This desk covers: High yield bonds (below BBB–), distressed and defaulted debt; “bank” debt (**EXPLAIN**) and collateral being acquired for CLO production (collateral includes leveraged loans,..**WHAT ELSE**).

IR risk factors are the same. A majority of the bonds, bank debt and distressed debt are mapped to credit-spread indices of high-yield bonds in 12 industries. Firm-specific components of credit risk are estimated as described in subsection 1.1.2. Defaulted bonds are treated as equity, on the premise that eventual bond-recovery will be in the form of equity in the restructured firm.<sup>9</sup> The recovery volatility,  $\sigma_r$ , is estimated as the market-wide mean volatility of unleveraged equity.

#### Notes, Follow-ups, etc.

Some of these instruments have some characteristics that can make VaR-capture less than straightforward.

1. Expect idiosyncratic risks to be relatively higher for HY bonds (less systematic risk). It would be worth investigating how well the bank's procedures capture these risks.
2. Obtain more detail regarding the different types of bank debt and their VaR treatment.
3. For example, conversations revealed that the undrawn portion of commitments, lines of credit, is treated as being fully drawn/funded; this overestimates the risk. The overestimation was sufficiently large that there have been discussions with the desk, and, as a result, "spreads have been adjusted to look more like bond spreads." FOLLOW-UP: clarify the magnitude of overestimation and the adjustment procedure.
4. Obtain more detail regarding the collateral accumulated for CLOs—e.g., loan types, deal types, times to exit, etc. Are there any noteworthy concentration or specific risk issues?

### **1.4 Emerging markets bonds**

Basically similar approach.

Histories of spread indices (changes) for 32 countries are created from all sovereign bonds for a country. Each bond is mapped into a spread bucket based on country of issuance. Bond-specific risks are estimated using the "common" procedures. For the maturity-specific component, no

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<sup>9</sup>Some other banks treat distressed debt as well in terms of price, rather than spread, volatility, based on the nature of trading—they do not trade on a relative-yield basis, but on expected recovery. That is, for such bonds, default probability is high enough that default is viewed as being imminent.

separate estimation. Instead, parameters obtained for High Grade and High Yield are applied.

☛ How? Those are issuer-specific? ; **FOLLOW-UP**.

## 1.5 Credit derivatives

### Products and instruments

The range of products includes single-name CDS, “standard” index tranches, bespoke CDO tranches, and some swaptions (i.e., options to enter into a CDS)

### Risk factors

It is assumed that the IR sensitivity of these instruments is relatively small. Hence, an IR risk component for VaR is computed only at the aggregate desk level based on the aggregate dollar duration of the desk.<sup>10</sup> The basic credit-related risk factors are handled via the “common” methods outlined earlier. Same data frequency and bucketing. Specific risk parameters for the “parallel” move component are from HG and HY estimations—i.e., for same names. However, unlike the other credit products, recovery risk is considered for *all* credit derivatives, not just those on defaulted assets—the potential variability in anticipated recovery rates is estimated as earlier. Finally, the bank also incorporates two other types of risks unique to this product set, restructuring risk and correlation risk—these are discussed in greater detail subsequently.

### Revals

Unlike bonds, credit derivative positions are not bucketed to a particular maturity. Instead, *partial* durations, i.e., sensitivities to particular points/regions on the spread curve, are computed for each position.<sup>11</sup> An interesting feature of the tranche positions is that they generate *indirect* exposure to particular issuers. Tranche payoffs, and hence their market values, depend on the anticipated default likelihoods and recoveries (in the event of default) of a pool of reference as-

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<sup>10</sup>Credit derivatives are typically “unfunded”. Thus, unlike bonds or loans, their periodic “coupon/premium” payments typically consist of just credit-spreads (compensation for credit risks borne), and do not include a default-free component (time-value of money on the principal). If the spread is smaller than the default-free component, the interest rate risk will also be smaller. Also, contractual maturities are generally fairly short.

Very high-spread CDS are expected to default soon, effectively curtailing their maturity.

<sup>11</sup>Roughly speaking, a partial duration is computed by perturbing the *only* spread at a particular maturity (leaving the other spreads unchanged) and revaluing the position. The sum of the partial durations is tantamount to the perhaps more familiar duration measure, which is computed off a parallel shift of the curve.

sets/issuers. Tranche values change as the market revises its estimates of these parameters, for individual issuers as well as the likelihood of “correlated” changes (across the reference names) in credit-quality. A tranche’s sensitivity to a reference asset/issuer is *not fixed*; rather it changes as the afore-mentioned parameters are revised. Because of this variability of correspondence between a tranche and its underlying reference assets/issuers, for VaR and other risk measurement purposes, a tranche is often represented in terms of “delta-equivalents.” This is the notional amount of single-name CDS that experiences the same (absolute) value change, as does the tranche, for a 1bp change in that issuer’s CDS spread<sup>12,13</sup>

As per conversations, recovery sensitivities are computed by “holding spreads constant” and revaluing at a 10% higher recovery value.<sup>14</sup>

### Aggregation

P&Ls due to non-HistSim risk factors are aggregated by assuming that those factors are statistically independent of the P&Ls from HistSim risk factors. Additional notes are provided below.

#### **1.5.1 Some notes on restructuring and correlation risks**

### Restructuring risk

Credit Default Swaps vary slightly, but systematically, as to the set of “credit events” under which they pay off—mostly to do with whether or not “corporate restructuring” is a credit event. Thus, for example, recently originated North American investment grade CDS trade under Mod-R, and, hence, the bank uses, for each reference issuer, its Mod-R curve as the benchmark for valuation, etc. CDS trades which reference that issuer but trade under a different provision

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<sup>12</sup>Possibly, only at a given maturity.

<sup>13</sup>Looked at differently, this is the amount of single-name CDS that would hedge the tranche against a 1bp move in that issuer’s CDS spread.

<sup>14</sup>TO DELETE?: The prices of credit-sensitive instruments also change as investors alter the perceived LGD (Loss Given Default), or, equivalently, the recovery rate. Bear Stearns computes such a VaR contribution. The potential variability in anticipated recovery rates is estimated as earlier; the recovery sensitivity of instruments is provided by Front Office models (calculation method?); the final required input is the expected recovery rate, assumed to be 40% (CHECK?); with all of these a VaR contribution from recovery volatility can be calculated. and recovery volatility used to compute recovery-related VaR contribution.

(e.g., No Restructuring or NR) will have a “basis risk” relative to the benchmark curve for that issuer—i.e, the CDS spread or premium for such a trade will differ from an equivalent trade subject to the benchmark provision. The bank’s approach to these risks is as follows.

The curve corresponding to the restructuring provision best representative of a market segment is chosen as the benchmark curve: (i) ModR (MR) for North American investment grade; (ii) No Restructuring (NR) for North American sub-investment grade; (iii) ModModR (MMR) for Europe; (iv) Old Restructuring (OR) for Asia and Latin America. Basis risks are assumed to independent across issuers but perfectly correlated within an issuer. The weekly standard deviation of the basis spread between any benchmark curve and a non-benchmark curve is taken to be 20% of the standard deviation of the issuer-specific spread changes (estimated as described elsewhere). This is applied to the current spread (OAS) of the position to obtain a basis point s.d. which is multiplied by the duration to yield a dollar amount of risk. Aggregation proceeds as for other independent risks.

#### Correlation risk for synthetic CDOs

The values of a CDO’s tranches change as the market revises its views on the distribution of the overall future default rate of the CDO’s reference asset pool. It has become common practice to model the distribution of the overall default rate via a so-called correlation parameter (a higher correlation means greater uncertainty about the future default rate—i.e., higher probabilities of more extreme (very high *or* very low) default rates). Although the correlation parameter is not directly observed or directly traded, it is possible, under certain assumptions, to compute implied correlations from prices of actively traded standardized tranches—these are the so-called base correlations. The bank has compiled a 2-year history of weekly observations on base correlations of each of 5 tranches of 18 different indices. Tranches of custom or bespoke CDOs are mapped to one or more of the standard tranches.<sup>15</sup> Sensitivities of the tranches to base correlations are supplied by the desk. Correlation-related VaR is assumed to be statistically independent of other VaR contributions.

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<sup>15</sup>For standard tranches with insufficient history, there is a fallback procedure. This should become less important as time passes and better historical data is accumulated.

### 1.5.2 Notes, Follow-ups, etc.

- ☛ Check on swaption treatment—desk pricing formula; VaR treatment—e.g., how to get estimates of the volatility of the hazard rate; are the underliers single names or index tranches?
- ☛ CHECK that Exposures to credits referenced via CDO tranches are represented as “delta-equivalents”
- ☛ What are the name-sensitivities received from FO systems for CDOs? How are these computed (re-valuation of the tranche at perturbed name-level spread, or some quasi-analytic shortcut)? Do these sensitivities address potential nonlinear price-impacts on the tranches?
- ☛ The HistSim simulates “correlated” or joint moves of individual credit spreads (via their dependence on the rating-industry index change). How is the change in a tranche’s value for such joint moves in the reference credit spreads computed? E.g., via “adding up” *partial/single-name* sensitivities, or some method for recognizing that the price-impact of a joint move could be different than just the simple additive impact?

#### Correlation risk for synthetic CDOs

- ☛ Nonlinearities in tranche sensitivity to correlations? Properties of the historical series of base correlations—e.g., magnitude of typical weekly change (& thus whether nonlinearity of sensitivity is a practical issue), trends, variance, jumps, etc.
- ☛ Mapping of bespoke tranches to traded indices—get a sample from Oliver. Mapping for hedging vs. mapping for VaR—are they the same?
- ☛ Quality of standard tranche data—length of history and other matters

#### Restructuring risk for synthetic CDOs

☛ on p. 21, the sub-heading “Restructuring risk for synthetic CDOs” should read just “Restructuring risk”—viz., discussion applies to single-name CDS outside CDOs as well?

1. Ans: Recovery sensitivity estimated by “holding *spreads constant* (should this be term structure of hazard rates) and bumping expected recovery up by 10%” FOLLOW-UP: check
2. Normality will not constrain recovery to lie between 0 and 100%. This may be compounded by high values of  $\sigma_r$ . What are typical estimates of  $\sigma_r$ ?

Ans: In practice, “simulated”/implied recovery rate will stay in bounds.

3. Are all of these calculations (viz., index-spread effects, issuer-specific effects, etc.) also applied to names referenced in CDO tranches? Are nonlinear price-effects also factored in?

Ans: single-names pulled out of CDO tranches on delta-eequivalent basis and same analysis applied. Nonlinear effects not accounted for.

4. Some “basis risks” arise in the mapping of bespoke tranches to standard index tranches: (i) dissimilar underlying names; (ii) dissimilar attachment points. How are these handled? What is their relative importance?

Ans: READ Oliver meeting notes.

5. Some info on the time-series would be helpful, e.g., length of history

6. The treatment of indices with insufficient history was not completely clear. We would like to discuss further.

Ans: No data, e.g., for AAA Technology CDX tranche (none exists). On the other hand, unlikely to have such an exposure. Not an issue at present

## 1.6 Municipal bonds

### Products and instruments

Products with *linear* exposure to “municipal risk” are booked here; Muni derivatives are booked under Fixed Income Derivativves.

### Risk factors

IR risk factors are given by 5 different points on the BMA swap curve. Credit risk factors are developed by mapping each bond, based on its *municipal* rating to one of 4 corporate bond rating indices: (i) AAA to AA-; (ii) A+ to A-; (iii) BBB+ to BBB-; (iv) High Yield index. Historical percentage chages in the index spread multiplied by the OAS (relative to the BMA curve) and the spread duration of the position provides a historical P&L series.

A bond-specific component of credit risk is computed using the same approach and parameters as that for HG and HY bonds. Defaulted bonds (are there any?) also receive the same treatment as described earlier.

### 1.6.1 Notes, Follow-ups, etc.

☛ Need a better feel for bank's portfolio: distribution of product types, exposures, muni derivatives, etc.

☛ For Muni bonds would the MMDA to BMA basis also be relevant?

The MMD (a AAA rate) to BMA basis has varied from +30bp to -10bp over the last 2 years—due to “technical.” FOLLOW-UP: read up on MMD vs. BMA ; what the trades reference etc.

☛ Clarify what is meant by corporate—e.g., only industrials (no utilities, financials, etc.)

☛ Comparability, compatibility between Muni ratings and corporate ratings (rating standards; meanings of ratings; methodologies, etc. But, could be “conservative” [for same rating, muni default rates are far fewer? But what about spread volatilities, etc...

ANS: Corporates' parameters are estimated from “subgroups” of rating *and* industry. Munis' coefficients are corporate averages, across all industries, for a rating. Thus, all munis within a rating are treated as being perfectly correlated, suggesting an overestimate of the “general market” risk. What does that imply for muni specific risk? FOLLOW-UP: Reread and check.

## 2 Interest rate products

### 2.1 Government and Agency bonds desk

#### Products and instruments

#### Risk factors

Products in this desk face exposure to changes in yields/rates across the spectrum of maturities. Interest rate risks that are “common/systematic” (in a sense described subsequently) across the maturity spectrum are represented as HistSim factors. Interest-rate related risks (of individual securities) that are security-specific or non-systematic are captured via parametric (non-HistSim) methods. A single, HistSim, implied volatility risk factor is also used.

#### Overview

Banks' portfolios generally face exposure to changes in yields/rates across the spectrum of maturities. In a HistSim approach for VaR, it is impractical and unnecessary to directly in-



clude each point of exposure as a risk factor. Instead, by exploiting the dependence/correlation across yields (of different maturities) one can identify just a few “key” risk factors—which may themselves be select points on the yield curve—that can explain a large part of the variation in yields of *all* maturities. Operationally, the relationship between an yield of arbitrary maturity and the included factors is first estimated. Then, applying the estimated coefficients to historical observations of the risk factors allows one to estimate/compute the corresponding change in yield for any arbitrary maturity.

BS employs a 5-factor model, so that the “systematic” drivers of yields are captured for VaR via HistSim. The expectation is that these 5 systematic factors will explain most of the yield-variation of a wide set of individual securities linked to Treasury, swap and agency rates. Inevitably, however, individual securities will exhibit some degree of residual yield- or price-variation. The bank estimates the magnitude of the residual yield-variation and captures that through parametric add-ons. For aggregation purposes, the idiosyncratic variation is treated as being uncorrelated with the HistSim, and handled accordingly.

*Digression: The 5-factor model*

The structure of the bank’s 5-factor model and estimation procedure are briefly described here. The bank uses weekly historical changes in swap rates to estimate the model.

The change in the 10-year swap rate is taken to be the first factor. Other factors are successively derived from residuals of regressions on the previous factors. Thus, denoting the rate-change of arbitrary maturity  $i$ , for historical week  $t$ , by  $\Delta y_{it}$ , the first set of regressions take the form:

$$\Delta y_{it} = \Delta y_{10t} + \epsilon_{it}^1$$

where  $\epsilon_{it}^1$  is the residual for the  $i$ ’th maturity for the 1st factor. The absence of a regression coefficient indicates that it is assumed to be unity ( $\beta_i^1 = 1$  for all  $i$ )—thus, the first factor implies a parallel move of the entire curve, whereby rates of all maturities experience the same change as the 10-year rate.

The second factor is taken to be the residual of the above “regression” for the 2-year rate—i.e., factor 2 is  $\epsilon_{2t}^1 = \Delta y_{2t} - \Delta y_{10t} = \Delta(y_{2t} - y_{10t})$ , which amounts to the change in the 2 to 10 year slope. The second set of regressions take the form:

$$\epsilon_{it}^1 = \beta_i^2 \epsilon_{2t}^1 + \epsilon_{it}^2$$

Making the appropriate substitutions, this is seen to be

$$\Delta y_{it} - \Delta y_{10t} = \beta_i^2 (\Delta y_{2t} - \Delta y_{10t}) + \epsilon_{it}^2$$

and, further:

$$\Delta y_{it} = \Delta y_{10t} + \beta_i^2 (\Delta y_{2t} - \Delta y_{10t}) + \epsilon_{it}^2$$

The third factor is the residual of the 5-year rate from the second regression; the fourth factor is the residual of the 6-month rate from the third regression and the fifth factor is the residual of the 25-year yield from the fourth regression. The historical outcomes for each of these factors can be easily derived in terms of the historically observed changes in yield curves. Then, the historical outcome for a yield of arbitrary maturity  $i$  is approximated as

$$\Delta y_{it}^{\text{sim}} = \sum_{j=1}^5 \beta_i^j F_t^j$$

where the  $\beta$ 's are the estimated coefficients and the  $F_t^j$  are the historical factor outcomes.

#### HistSim Risk factors

In the above, 30 points on the curves are considered—i.e.,  $i = 1, \dots, 30$ . Coefficients for Treasury yields are similarly estimated, *except* that the same factors from the estimation for the swap curve are used. Finally, a volatility-related risk factor, proxied by the historical implied volatility series of a 10-year cap, is also used.

#### Revals for HistSim risk factors

Using front office models, sensitivities are calculated for each position with respect to predefined sets of factor scenarios. For options, sensitivity to implied volatility (“vega”) is also supplied to the VaR calculator. Multiplying the sensitivities by the historical factor outcomes results in a historical P&L series to be used for VaR.

#### Parametric add-ons

The bank runs (time-series) regressions of individual Treasury bonds, of various maturities, on a “matching” (of closest maturity) Treasury yield. Pooling the regression residuals across time, and segregating by bond-maturity, a residual standard deviation is computed for each maturity (hereafter denoted by  $\sigma_{\text{res},i}$  where  $i$  is the maturity). Subsequently, the residual/idsiosyncratic

component is assumed to be: (i) perfectly correlated across all securities for a given maturity  $i$ ; (ii) uncorrelated for different maturities.

The P&L contribution is then computed as follows. For each security in the current portfolio, its sensitivity to each of the 30 yield curve points is supplied:  $D_{ij}, i = 1, \dots, 30$ . The security's residual standard deviation in dollar terms is then  $\sigma_{\text{res},i} \times D_{ij} \times M_{ij}/100$ . ( $M_{ij}$  is the market value of the position). Following the assumption of perfect correlation across all  $N$  securities in the portfolio at a maturity point  $i$ , the portfolio-wide standard deviation of residual price-variation of maturity  $i$  is given by

$$\sigma_{\text{PLres},i} = (\sigma_{\text{res},i} \sum_{j=1}^N D_{ij} M_{ij})/100.$$

And, assuming independence of the residual risk across different maturities, the total residual risk is given by

$$\sigma_{\text{PLres}}^2 = \sum_{i=1}^{\text{nmats}} \sigma_{\text{PLres},i}^2$$

The residual risk parameters are calculated separately for securities related to each yield type—(i) one for each swap curve by currency; (ii) for the agency curve, Eurodollar futures and agency securities.

### 2.1.1 Notes, Follow-ups, etc.

1. What are the products in this desk? Only linear—if so, why the vega?

☛ No details are provided (in the VaR document) on how these sensitivities are computed (e.g., the scenario sets used, etc. See qlist for why this may be important.) Should request a technical spec of this.<sup>16</sup>

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<sup>16</sup>

1. A sketch of how the reval sensitivities are computed would be helpful. E.g., the factor-perturbations (size and direction) for which revals are computed; are revals “partial” (computed by perturbing only one factor at a time, holding the others constant), or are “cross-partials” also considered?

**Ans:**  $\pm 25\text{bps}$  for each factor; then  $\pm 50\text{bp}$  for convexity. The fineness of the grid and the number of grid points are tuned to the volatilities of the factors—e.g., finer grid for the first factor. FOLLOW-UP: get the details. Cross-partial question not answered.

2. Are revals computed via the FO model? Does it use the same factor model, or do factor outcomes have to

## 2.2 Fixed Income Derivatives

### Products and instruments

#### Overview

The basic approach to modelling yield curve movements is the same as described earlier—only the factor definitions are slightly different. Movements in the term structure of implied volatility are also modelled, using a similar factor approach, except that three (rather than just one) factors are used. Finally, residual risks (relative to the yield curve, but not to the volatility curve) are also captured via the parametric methods. Revals are based only on sensitivities (partials)—grids are not used.

Two interrelated points are worth noting. First, only *one* IR curve (namely, the swap curve) is used; all other curves are represented as a *basis* to that—e.g., BMA basis, Treasury basis. Second, while most securities have clear-cut mapping to a single curve, securities dependent on multiple curves<sup>17</sup> will still be mapped to a single curve.

#### HistSim Risk factors

The constant maturity swap (CMS) curve is the basic workhorse for FID. This is built up from 3-month Libor rate, eurodollar futures rates out to 5 years at 3-month intervals and swap rates thereafter out to 30 years—more points than used, e.g., for the “Governments” desk.

The first factor is the 10-year swap rate; the second factor is the 2 to 10-year slope; the third factor is the residual of the 3-month swap from the second regression; the fourth factor is the residual of the 3-year rate from the third regression; and the fifth factor is the residual from the fourth regression.

Volatility factors are estimated in a similar fashion. The first factor, however, is taken to be the 10-year swap rate change (rather than the change of a point on the vol term structure). The second factor is the residual, from the first volatility regression, of the 5×5 (5-year option on a 5-year swap rate) swaption volatility change; the third factor is the residual, from the second vol regression, of the 3-month option on the 10-year swap rate; the fourth factor is the residual, from

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be re-cast in terms of yield curve moves?

**Ans:** Yes, using Front Office model. Did not explore other q's.

<sup>17</sup>E.g., for a swap, each leg's payoffs are linked to different curves.

the third vol regression, of the 1-year option on the 2-year swap rate.

Additional spread-related factors such as the swap-to-Treasury spread and the Muni Bonds BMA to swap curve are also included.<sup>18</sup>

### Residual risks

Individual EDF (eurodollar futures) and swap rates are regressed against the CMS curve rate of the corresponding maturity. The residuals are interpreted as the movement of the EDF/Swap curve not explained by the factors. The delta and gamma of the current portfolio positions, in conjunction with the residual standard deviation, gives an estimate of the residual risk for that maturity.

### Sensitivities & Revals

First-order sensitivities to each of the HistSim and residual risk factors are supplied from Front Office models.<sup>19</sup>

## **2.2.1 Notes, Issues, Follow-ups, etc.**

### Risk factors & mapping

1. Most securities have clear-cut mapping to a single curve. However, securities dependent on multiple curves will still be mapped to a single curve. Expect this not to be a problem. Don't know how many securities are subject to this.
2. What might be the impact if the first vol factor were chosen to be a point on the vol term structure rather than the first IR factor?  
**Ans:** Used to do it that way. But the current approach is closer to the duration/hedging approach used by the traders. However, the relationship embodied in the bank's current treatment is empirically more valid for the US.
3. Additional spread-related factors such as the swap-to-Treasury spread and the Muni Bonds BMA to swap curve are also included.<sup>20</sup>

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<sup>18</sup>an average spread across the curve? or the spread of a select point?

<sup>19</sup>There is some ambiguity in the text as whether or not higher-order partials are used. E.g., for residual risks, one para says deltas and gammas are used; another says only durations are used.

<sup>20</sup>an average spread across the curve? or the spread of a select point?

### Reval sensitivities

1. Note Vol smile/skew not modelled. Desk is doing some sensitivity analyses. Hasn't made it to RIO yet. RECOMMEND : sensitivityanalysis to partials vs. grid.
2. A sketch of how the reval sensitivities are computed would be helpful. E.g., the factor-perturbations (size and direction) for which revals are computed; are revals “partial” (computed by perturbing only one factor at a time, holding the others constant), or are “cross-partial” also considered?

**Ans:**  $\pm 25$ bps for each factor; then  $\pm 50$ bp for convexity. The fineness of the grid and the number of grid points are tuned to the volatilities of the factors—e.g., finer grid for the first factor. FOLLOW-UP: get the details. Cross-partial question not answered.

3. Are revals computed via the FO model? Does it use the same factor model, or do factor outcomes have to be re-cast in terms of yield curve moves?

**Ans:** Yes, using Front Office model. Did not explore other q's.

4. There is some ambiguity in the text as whether or not higher-order partials are used. E.g., for residual risks, one para says deltas and gammas are used; another says only durations are used.

## 3 Mortgages

### Products and instruments

For VaR purpose, mortgage (and closely-allied) products are grouped into: Agency Residential, Non-Agency Residential, Commercial, ABS & CDOs. Instrument and product types are further described under each sub-heading.

### 3.1 Overview

#### Residential mortgages—Agency

Products covered under this sub-heading include Passthroughs and CMO tranches, and hedges.

A 5-factor model is used to estimate (via the regression methods described previously) the systematic components of interest-rate changes, and to develop associated HistSim risk factors. Changes in the “mortgage basis” (which encapsulates the refinancing incentive) are decomposed into a “systematic” and a “residual” component. The systematic component, due to the systematic IR changes alone, is determined internally within the bank’s pricing model—as such there are no explicit risk factors for this component. The residual component is the variation in the mortgage basis not explained by changes in Treasury and swap rates, for which a HistSim factor is used. A single implied volatility factor is used—the 1-year option on the 10-year swap rate.

Residual risks are estimated by examining the unexplained price-variation of different types of mortgage instruments. The estimation and aggregation of residual risk are described in greater detail subsequently.

A bank-developed model, with the acronym PORC, is used for valuation and risk analyses of residential mortgages. Inputs to the model include Treasury and swap curves and implied volatilities for points on those curves. The residual term of the mortgage basis is also an input.<sup>21</sup>

#### Residential mortgages—Non-agency

This grouping subsumes two desks, the non-agency CMO desk and the ARMs desk. The non-agency CMO desk handles all fixed rate non-agency mortgages (primes, Alt-As, subprimes) and all subprimes (fixed rate as well as ARMs). The ARMs desk handles ARMs, except subprime ARMs. The books contain unsecuritized whole loans (pipeline) as well as seasoned securities.

Interest rate risk (i.e., including first-order prepay effects) is estimated using the same factor approach as described elsewhere. Residual risk for jumbo primes and Alt-A’s is parametrized by agency “residual-risk” standard deviations, inflated by 10%—this is to account for their observed higher residual price-volatility, relative to agencies. For prime and Alt-A ARMs, “residual-risk” standard deviations that are 50% of those applicable to fixed-rate non-agencies, are used—this

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<sup>21</sup>As already noted, the systematic component of the mortgage basis (current coupon on 30-year fixed less the 10-year swap rate), is derived from the swap and Treasury rates HistSim risk factors.

reflects the lower prepayment uncertainty of ARMs.<sup>22</sup>

Subprimes are believed to behave differently than mortgages of higher credit-quality in at least two respects: (i) they exhibit low interest-rate related prepayment sensitivity, but (ii) are sensitive to credit perceptions. Accordingly, the residual risk approach is somewhat different for subprimes. Details on how this is measured and aggregated are provided later.

### Commercial mortgages

Products include whole loans held for securitization as well as secondary market securities (tranches of previously issued CMBS).

HistSim risk factors for commercial mortgage-backed securities (CMBS) include: (i) interest rate changes— weekly changes on USD CMT rates for five different maturities,<sup>23</sup> and (ii) changes in the spreads of CMBS indices of different ratings—4 investment grade CMBS categories, 2 sub-investment grade and one IO. These spreads are viewed as “systematic” credit-risk indicators. The bank believes that deal-specific credit risk is minimal.

Each whole loan position awaiting securitization is tranching in the same proportions as the most recent deal, whereby the above treatment for CMBS securities can be applied.<sup>24</sup>

### ABS & CDOs

Interest rate data on USD CMT rates for 5 different terms are used. Each bond is mapped into one of the 5 terms based on expected life; floaters are mapped into the shortest bucket.

Spread data are collected for these ABS categories: auto, credit card, home equity, manufactured housing, high LTV loans and student loans. For CDOs, spread data on high yield bonds, high yield loans and asset-backed securities are collected. Spread indices are further broken down by rating categories, fixed/floating (for some products) and seasoning. These capture the broad market components of these instruments’ credit risk. Each bond is mapped into a spread bucket based on tranche type.

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<sup>22</sup>The last characterization suggests that the bank views the “residuals” of individual securities (relative to the model) as being attributable to security-specific prepay behaviors (rather than to, say, “liquidity” differentials).

<sup>23</sup>Unlike residential mortgages, commercial mortgages contain provisions preventing or severely discouraging prepayments by borrowers (e.g., an extended *lockout* periods of 10 years). So a CMBS essentially behaves like an ordinary noncallable bond with respect to changes in default-free interest rates.

<sup>24</sup>However, tranches below B are assigned the credit risk of the B-tranche.



Bond-specific credit risk components are also calculated using the same approach and parameters as for corporate bonds. Assuming equivalence of ratings to the corporate bond scale, the specific risk volatility associated with a corporate rating is applied.

Interest rate and spread durations are obtained from internal analytics as well as outside sources such as Bloomberg.

## 3.2 Residual risks

### 3.2.1 Agencies

For different mortgage types, a history of residuals relative to the PORC model is created. For each historical date, the PORC model is calibrated to two benchmark securities, the current coupon TBA and the current coupon agency Trust IO.

Residual (theoretical versus observed price) series for two broad categories of mortgage types—non-current coupon TBAs and IOs—are generated. Following a Principal Components (PC) analysis of the daily changes in residuals, the bank concluded that there are two broad common factors to each set of residuals.<sup>25</sup> For each component, the estimated standard deviation represents risk per unit face value. Thus, there are four standard deviations— $\sigma_{tba1}$ ,  $\sigma_{tba2}$ ,  $\sigma_{IO1}$ , and  $\sigma_{IO2}$  to serve as risk parameters.

To proceed, some notation is necessary. Each security  $i$  is tagged by product type ( $j$ : TBA or IO), collateral maturity and net coupon ( $k$ : 30-year, 15-year and other (mostly 20-year) and coupon combinations). Based on duration and convexity, each mortgage security in the current book is represented as a combination of a current coupon TBA and a current coupon IO, with face values  $F_{ijk,tba}$  and  $F_{ijk,IO}$ . The following equation for the P&L variance of a portfolio of  $N$  securities indicates the bank's correlation assumptions.

$$\begin{aligned} \sigma_{\text{res., port.}}^2 = & \sum_j \left( \sum_{i \in j} \sigma_{tba1} F_{ijk,tba} \right)^2 + \sum_k \left( \sum_{i \in k} \sigma_{tba2} F_{ijk,tba} \right)^2 \\ & + \sum_j \left( \sum_{i \in j} \sigma_{IO1} F_{ijk,IO} \right)^2 + \sum_k \left( \sum_{i \in k} \sigma_{IO2} F_{ijk,IO} \right)^2 \end{aligned}$$

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<sup>25</sup>Roughly 70 to 80% of the variance was explained by the first PC, and 10% by the rest. Moreover, residual changes of TBAs are uncorrelated with those of IOs.

### 3.2.2 Prime and Alt-A non-agencies

The same procedure as for agencies is adopted for these mortgages. As noted, the residual risk parameters for agencies are used after scaling.

### 3.2.3 Subprimes

The treatment here is similar to specific component of credit risk for credit products. The bank estimates “cash-flow” spreads and durations for each position.<sup>26</sup>

Via empirical estimation, the volatility of the spreads is divided into two components, a market-wide component common to all positions and an issuer-specific component based on the loan originator. These volatilities are expressed as a percentage of the cash-flow spreads and are denoted as  $\sigma_M$  and  $\sigma_i$  for  $i = 1, \dots, N_I$ , respectively.

Each security or whole loan is mapped to a particular issuer. The dollar spread durations of all securities within an issuer are first summed up and multiplied by the spread volatility to obtain the standard deviation estimate for that particular issuer. That is,

$$\sigma_{i,res.} = \frac{\sigma_i}{100} \sum_{j=1}^N D_{ij}^s M_{ij} S_{ij}$$

where  $\sigma_{i,res.}$  is the standard deviation estimate for issuer  $i$ , and  $D_{ij}^s, M_{ij}$  and  $S_{ij}$  are the spread duration, market value and cash-flow spread for the the  $j$ 'th security or loan for issuer  $i$ . As evident, specific risk is assumed to be independent across issuers.

The residual risk for market-wide spread moves is given by

$$\sigma_{M,res} = \frac{\sigma_M}{100} \sum_{i=1}^{N_I} \sum_{j=1}^N D_{ij}^s M_{ij} S_{ij}$$

Adding the components together, we have

$$\sigma_{res., port.}^2 = \sigma_{M,res.}^2 + \sum_{i,res.}^{N_I} \sigma_{i,res.}^2$$

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<sup>26</sup>In this context, “cash-flow” is a synonym for “zero-volatility.” The cash flow spread is computed, in effect, by assuming that the instrument’s cash flows do not vary with interest rates. Subprimes are believed to have very low rate-sensitive prepayments; i.e., the prepay option is of little value. In some sense, for purposes of valuing mortgages, that is the same as assuming that rates have zero volatility (are deterministic).

### 3.3 Notes, Follow-ups, etc.

#### Commercial mortgages

1. Bank should provide more empirical and conceptual support for the idea that deal-specific credit risk is minimal.
  - Mapping of whole loans—As per conversation, tranches below B are assigned the credit risk of the B-tranche. Need more support for this treatment. Depending on time elapsed since the last deal, the tranche subordination levels may have changed? Are the historical spreads data based on new issues or secondary trading of seasoned issues?

#### Residuals—Agencies

1. To confirm: The PORC model is re-calibrated to the market data as of each historical date?
2. Need to clarify how these weights (for duration-convexity equivalent portfolio) are determined—are they unique?
3. Credit risk for non-agencies? Might not be insignificant for junior tranches of CMOs. Any VaR treatment at all?

## 4 Equity and Equity Derivatives

#### Products and instruments

Cash equities and equity-derivative products (vanilla and exotic options on individual names, baskets, indices) are the principal products.

#### Risk factors & Revals

The principal risk factors relate to stock price moves (single-name and indices) and moves in term structures of implied volatility.

For the price-levels of equities, the preferred HistSim factor is name-specific weekly [?] return histories. When such historical data are insufficient or unavailable, proxies are developed using procedures described subsequently.

To the extent possible, name-specific implied volatility term structures are also fed as HistSim factors.

FX and interest rate risks are also considered.

Reval grids/matrices are used to capture the nonlinearities *and* the cross-partials inherent in option positions.

## 4.1 More on data series

### Stock price series—full history

Daily price and dividend histories are collected. Note the use of daily data here.

### Stock price series—insufficient history

Using the recent history (at least 60 days) a 1-factor index (the actual index used varies) model is estimated. The standard deviation of the error term,  $\sigma_{ei}$  is the estimate of the firm-specific volatility. Thus, the missing return for firm  $i$  on historical day  $t$  is filled in as  $\hat{r}_{it} = \hat{\beta}_i R_I + u_{it}$ , where  $R_I$  is the index return (selected for that stock),  $\hat{\beta}_i$  is the estimated coefficient,  $u_{it}$  is a draw from a  $\mathcal{N}(0, \sigma_i^2)$ .

☛ Issues: Normality assumption; single draw

Stocks that have less than 3 months of daily data are assigned a  $\beta$  of 1.0 and a volatility equal to the average of  $\sigma$  for all stocks with available data.

☛ Better to assign on basis of market cap, trading volume, industry, and related criteria.

### Implied vols—full history

The starting point is a vendor-provided database of exchange-traded option prices and contract terms for a large number of stocks and a limited number of indices. Implied vols are then computed using Black-Scholes, creating a dataset of daily implied vols for a range of maturities and strikes, coupled with interpolation as necessary. If data for a firm is not available, a proxy based on index implied vol is created. [??]

For VaR purposes, bank requires vols from 30% in-the-money to 30% out-of-the-money—inter- and extrapolation are used to achieve this from available data. For most stocks, the available data are only at maturity points of 1, 3, 6, 9, 12 and 18 months. However, term structures out to 10 years are required to revalue long-dated trades. For this, Totem histories on the entire vol surface (range of strikes and maturities), at a *monthly* frequency, are used to determine an extrapolation scheme. Based on a cross-sectional analysis of individual and index vol surfaces,

the bank estimates that annualized ATM vol changes in the form  $T^{-0.3}$ , where T is the option maturity.

☛ Is the  $T^{-0.3}$  relation applied for all degrees of moneyness? Isn't there a cone—i.e., skew tightens/disappears at long maturities? convergence to ATM vol.

#### Implied vols—no history

For each historical date  $t$ , the standard deviations of returns, over the prior 3 months, of the stock and the index are computed:  $\hat{\sigma}_{it}$  and  $\hat{\sigma}_{It}$ . The implied vol for an individual option with maturity  $\tau$  and moneyness  $\nu$  is then estimated as

$$\sigma_{i,\tau,\nu}^{IV} = \sigma_{I,\tau,\nu}^{IV}(\hat{\sigma}_{it}/\hat{\sigma}_{It})$$

Suitable bilinear interpolation along the maturity and moneyness dimensions are used to fill in.

#### Options on stock baskets: historical returns & implied vols

If the basket consists of stocks for which historical prices/returns are available, calculating historical basket prices is straightforward. Implied vol histories for baskets are typically not directly available (only internal marks? customized baskets). The bank takes the following approach to construct a proxy series. Implied vol histories of course are available for some baskets/indices. The bank assumes that, at any historical date, the implied vol of the basket is equal to the (observable) implied vol on the index. “scaled” by the relative volatilities of the basket to the index over some preceding subperiod.

If historical returns are not available for a constituent stock, they are proxied by the single-factor index plus idiosyncratic term model described earlier.

#### Revals for options

Both sensitivities in the form of partial derivatives ( up to second order) and 2-dimensional (pre-computed) reval grids/matrices (stock price and implied volatility) are used. The former are used for [WHICH EXACTLY?] — options on multiple stocks, because of computational issues arising from the high dimensionality of the reval matrix. Reval matrices are used for [??]–baskets. Grid specs on p. 46

## 4.2 Risk Arbitrage

### Products and instruments

This desk takes on positions in the stocks of companies that are parties to a potential takeover, acquisition, etc. The prospective *Acquirer* announces an offer, usually at a substantial premium over the current market price, for the *Target* company's shares. Post-announcement, the *Target's* stock price becomes decoupled from its usual drivers and instead varies mostly with the market's perception of the probability,  $p$ , that the deal will be consummated. The *Acquirer's* stock price usually suffers a modest decline, but continues to otherwise "behave normally". The bank's strategy usually entails a long position in the *Target's* stock [?NO OPTIONS, CONVERTS, etc?] and a short position in the *Acquirer's* stock.

Under the bank's approach, market risk over the VaR-horizon ( e.g., 1 week) arises from whether or not there is a deal-break. If the deal breaks, the loss is estimated by assuming that *Target's* stock price reverts to its pre-announcement level. If there is no deal-break over the next VaR-period, the market may revise its estimate of  $p$ , resulting in a change of the "spread" between the Offer price and the *Target's* current stock price—with attendant changes in portfolio value.

The deal-break probability,  $(1 - p)$  is inferred from the *Target's* current stock price. This estimate can be used to simulate whether or not a deal-break—i.e., a binary event—occurs over the VaR-horizon.<sup>27</sup>

The value-change for the no-dealbreak case is estimated from internal histories on spread changes across positions from inception to completion or break. Each deal in the historical database is classified along three dimensions: industry, spread-level [?? CHECK??] and expected time to completion. Volatility of returns for each combination along these three dimensions is computed from the historical observations.<sup>28</sup> Then, a simulated spread could be generated as a draw from [??WHAT DISTRIBUTION??] with that volatility parameter.

A simulation is run to generate the potential distribution, over the VaR-horizon, of the combined P&L arising from these two disjoint events. Ten thousand draws are made from a multi-

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<sup>27</sup>The inferred value of  $(1 - p)$  applies to the expected lifetime of the deal. It is converted to a weekly equivalent effectively by assuming a constant conditional likelihood of deal-break over the lifetime.

<sup>28</sup>If a current deal has no historical industry counterpart, the average across all industries is used.

variate Normal distribution—each draw corresponds to a joint outcome indicating which deals on the book broke and which did not. For the current implementation, the correlation matrix for the Normal is just the identity matrix—i.e., zero correlation across deals for deal breaks and spread moves. P&L for each type of outcome is generated as described earlier. The 95th percentile of the P&L distribution is the VaR due to the Risk Arb activity; it is aggregated as per the “independence” approach.

- How many deals on the book at a time? How “correlated” might they be [industries, etc.]

- Implementation of the simulation part is not clear. Particularly as to how the spread change is mated to the rest of it.

Stress tests are conducted by assuming non-zero correlations and increasing the deal-break probabilities. Both of these shift the P&L distribution such that portfolio losses are higher at any confidence level.

## 5 FX Positions

### 5.1 Overview

#### Products and instruments

Cash and derivatives

#### HistSim Risk factors

Interest rate; FX rates (for all ccy’s?)—spot and forwards?; implied vols—term structures or only one point? smiles?;

#### Revals

Interest rate—only first-order sensitivities used. For options, a 2-dimensional (FX rate and implied vol) reval matrix/grid. Sensitivities from in-house as well as vendor models.

### 5.2 Details

#### 5.2.1 Implied vol estimation

Implied vol histories are apparently not available in sufficient detail. So the bank creates a history based on proxies as follows.

First, for each historical date, the realized volatility of the spot FX rate [??CHECK] over the prior 3 months is computed. This itself is taken to be the applicable estimate of implied vol for a 3-month option at that historical date. More distant implied vols are assumed to decrease with the square root of time.

The historical FX rate and implied vol are then fed to the reval grid to generate option revals.

• Why no implied vol histories?

## 6 Further Q's

inflation trades?

VaR methodology for Finance desk (repos)?

## 7 From Notes

1. Wide-distribution (all “official” reports—including RM report; reg. capital, etc.) VaR-related calculations are anchored to a Weekly (5-day) horizon, from which a 1-day VaR is derived via a simple  $1./\sqrt{5}$  transformation.<sup>29</sup>
2. VaR is computed via a combination of Historical Simulation (mostly for “general” market risk factors, although issuer/issue-specific histories are also used (e.g., for equity returns)).
3. Certain risk factors are only observed at non-overlapping, weekly (5-day) intervals. So, for a position mapping *exclusively* to such risk factors, it is straightforward to generate a historical weekly P&L series.
4. Other risk factors, e.g., “liquid” factors, are observed daily—e.g., many interest rates, FX rates, credit spreads, etc. For a position mapping *exclusively* to such risk factors, a historical weekly P&L series is generated by *summing* daily P&L's, rather than revaluing positions subject to a 5-day change.

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<sup>29</sup>Note that individual desks may separately compute daily VaR-like measures, possibly using different computations.



5. However, for certain risk factors observed at weekly intervals (e.g., equity implied vols—daily data are thought to be “too noisy”), a different approach is taken. Assuming that weekly moves are generated by the sum of daily i.i.d moves, a daily equivalent move is computed by scaling the weekly move by  $1./\sqrt{5}$ . The reval corresponding to this constructed daily move is then rescaled to a 5-day equivalent by multiplying by  $\sqrt{5}$ .
  - ☛ My understanding from our conversations is that steps 4 and 5 are used for nonlinear positions which are revalued via a front-office supplied pricing grid. These grids are tuned to moves more typical of 1-day moves; so, for nonlinear products, this approach protects somewhat against potential extrapolation errors for larger 5-day moves. Is this correct?
  - ☛ Or is step 4 applied more generally, even to linear products? If so, what is the rationale?
6. ☛ How are products that do not map exclusively to just a “weekly” or just a “daily” risk factor handled?
7. Backtesting: non-overlapping?; daily equivalents?
8. Data: stable state is expected to be 4 years ( $4 \times 52 = 208$  observations—is this good enough for confident VaR).
  - ☛ Any other firms doing weekly VaR?

**Subject:** Suggestions Concerning VaR Documentation

**Date:** October 24, 2005

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In our judgment, the firm should aim to produce a more self-contained, comprehensive set of documents laying out the implementation and operational details of the VaR system. In broad terms, our suggestions are as follows. First, the quantitative document should supply more information regarding the underlying Front Office models and revaluation methods used—for models in the public domain, generic, “high-level” description would suffice (e.g., 2-factor Hull-White model); for internal models, more description would be required. Similar comments apply to statistical estimation procedures, algorithms, etc. The document also lacks information on certain products that are in VaR—e.g., options on CDS, inflation trades, mortgage derivatives, structured fund products, etc. In other cases, elaboration would help—e.g., the treatment of unfunded commitments.

Second, it would be helpful to have a more detailed, categorical description of the data—sources, the actual series used, scrubbing procedures, etc.

Third, as the group carries out tests (e.g., to choose between alternative series/methods, etc.), it would be helpful to document and maintain a record of the more important ones.

The remainder of this document offers some specific suggestions concerning the *existing* “quantitative” document.

## 1 General themes

Further elaboration along the following lines would be helpful:

1. Overview of products and instrument types; for each product/instrument set, risk factor representation and reval approach.
2. Risk factors: data sources; tenors/maturities used; transformations employed; proxied factors (e.g., counts)
3. Reval specifications: general approach—analytic, numerical (perturbation), etc. If numerical, basic outline.

## 2 Credit products

Brief discussion or notes on the following would fill in the gaps:

1. Reval specs on duration, convexity
2. Treatment of unfunded commitments
3. Calculation of recovery sensitivity (CDS).
4. Sample estimates of the recovery volatility,  $\sigma_r$ <sup>1</sup>
5. Delta-equivalents representation for capturing spread risk of CDOs.
6. Mapping of bespoke tranches to standard tranches, in capturing “correlation risk” of CDOs.

## 3 Mortgage products

### 3.1 Agency products

1. Clarify various points that the text is ambiguous/unclear about—e.g., that the yield curve coefficients are estimated *only* for the swap curve; that only a single mortgage basis factor (rather than several, based on product-maturity combinations) is used.
2. A very brief sketch of the PORC model may be helpful.
3. A brief sketch of how the sensitivities (to be applied to the HistSim factors) are computed would be helpful.
4. For the residual/idiosyncratic component, it would be helpful to have: stronger motivation/rationale, details on the estimation procedure, “economic” interpretation of the residuals.

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<sup>1</sup>To persuade the reader that it is small enough such that simulated recovery draws from the Normal distribution with  $\mu_r$  and  $\sigma_r$  stay between 0 and 100%

### 3.2 Non-agency products

1. It may be helpful to include a brief discussion of the rationale for applying scaled *agency* residual risk parameters .
2. A discussion of the rationale and procedure for mapping ARMs to TBA and IO buckets would be helpful.
3. It would be helpful to include a brief note on parameter estimates applied to subprime mortgages.

## 4 Equities

1. Clarify the rationale and mechanics of the “daily to weekly” scaling.
2. For Risk Arbitrage, the simulation step is not clear—particularly as to how it incorporates the spread change.

**From:** Steve Spurry and P.C. Venkatesh

**Subject:** Specific risk in traded credit at Goldman

**Date:** April 26, 2005

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Overall, we believe that the approach taken to incorporate "traded credit specific risk" into the existing VaR framework is reasonable. In our view, the methodology, the tests and results are all clearly described and documented.

Included below are various follow-up questions relating to the methodology (including components not in the VaR), the testing and the presentation. Also sketched are some suggestions regarding aspects of the modelling and testing. Feedback on whether these suggestions are useful (from your perspective), feasible, etc. would be appreciated. We would like to emphasize that these are meant principally as discussion items rather than formal requests for additional testing, etc. on your part.

## 1 Business and portfolio characteristics

Some details on the business and portfolio characteristics would be helpful. E.g.:

- Generally speaking, how much of the portfolio holdings arise from customer flow/facilitation and how much from traders' views and strategies? Do these proportions differ by type of instrument (bonds, CDS, CDO tranches)?
- Relative holdings/exposures of bonds, single-name CDS's, CDO tranches
- Holdings/exposures by name; broken out, if possible, by origin (bond, CDS, CDO)
- What are the relative proportions of index versus bespoke CDO tranches? What is the typical distribution of equity, mezzanine and senior tranche holdings? Longs and shorts?

## 2 Re: the methodology

Most of the questions here are drawn from the document "Credit Products VaR Model Documents", May 2004—i.e, section and page number references are relative to that document, unless otherwise indicated.

## 2.1 General questions and observations on data

- Typically, how many names (bonds and CDS) are present in the portfolio? Does the composition (by name, number, concentration) of the portfolio tend to change slowly or rapidly?
- What proportion of the portfolio (by number, exposure, and concentration) lacks historical data and is therefore proxied? E.g., is an automatic report generated of proxied names? How "similar" are these to the names with data (e.g., by company- (size, sector) and instrument-attributes (liquidity, embedded options))?
- Number of non-benchmark names with and w/o historical data

### 2.1.1 CDS/Bond Basis

- Are bond attributes such as embedded options (call, put, rating-triggered step-ups/downs, etc.) recognized, re-valued, monitored (possibly outside the VaR framework)? If so, how? If ignored, guesstimate of potential impact?
- What is the degree of overlap (by name) between the samples used for estimation of statistical properties and typical portfolio holdings? Could bonds in the portfolio differ from those used for estimation along several dimensions (coupon, maturity, seniority, embedded options, etc.)? If so, the bond basis used in the factor model may not capture all the relevant risks of the actual portfolio holdings?
- Empirically, is there any evidence that the properties of the bond basis vary with "liquidity" of the underlying CDS and bonds?
- On the Cash-CDS basis report, is the Matched Maturity CDS minus the BE CDS the bond basis measure used subsequently? Briefly, how is the BE CDS computed?

### 2.1.2 "Survivorship bias"

In dealing with name-specific histories, most banks focus on names/firms that are alive and active (either in the bank's own portfolio or in the general market). From a research/risk-modelling perspective, however, the histories of firms that have perished to financial distress could be quite

valuable in gauging what *might* befall the (apparently) healthy firms of today. At the same time, ways of simply and sensibly incorporating such histories into existing overall frameworks are not quite obvious. Your thoughts?

### 3 Estimation and parametrization

- To confirm: Only the total volatility,  $\sigma_i$  is treated as a function of the current spread level (overriding historical estimate of the vol), but not the (implied) pairwise correlations (through the factor-model  $\beta$ 's)? I.e., it can be argued that, similar to equities, the relative importance of systematic and idiosyncratic variabilities changes as the price/spread level (reflections of the underlying financial health of the firm) changes.
- It would be helpful to briefly document salient time-series properties of of univariate CDS spread changes—autocorrelations (lag-effects); importance of jumps, etc.
- The estimation of the relationship between volatility and the spread level is a little unclear—specifically, how are the inputs into the cross-sectional regression obtained. My reading of the doc is that, for each firm, the inputs, are the average spread and the volatility over a common time-period (e.g., the last month). Is this correct?
- The posited relationship between volatility and spread level clearly has a “forward-looking” intent—namely, that the higher the current spread, the greater *future* volatility is likely to be. However, under the above “temporal aggregation”, it is not necessarily clear whether higher spreads follow or anticipate periods of higher volatility. Your thoughts?
- By the inherent symmetry of the volatility measure, the vol–spread specification presumes that, at higher spread levels, there is a greater likelihood of larger spread increases or decreases. My prior would be that large decreases in spreads are less likely in such situations. Would your empirical analysis tend to support or refute this conjecture?

## 3.1 Revaluation

### 3.1.1 Re: section 4, IR risk

Why would the swap spread (to Governments) risk factor be necessary? For CDS, this should not be an issue, since the *IR DV01* is mapped to the swap curve (consistent with market convention, taking Libor (rather than the default-free Government rate) as the relevant funding rate), and CDS spread factor is measured relative to the swap curve as well. The same risk factors are used for corporate bonds, so that the “total risk” (i.e., IR + spread) should still be correctly captured (although it is probably more common to measure bond spreads relative to Government rates)

### 3.1.2 Tranche valuation and CS01s

A brief sketch of the desk’s approach to valuing tranches and computing their CS01s would be helpful. Alternatively, if pertinent model documentation can be supplied, we can review that and discuss separately.

## 4 Model Testing

These questions are drawn primarily from the document “Credit Products VaR Model: Model Testing Document”, February 2004, and the presentation dated April 2005.

### 4.1 Suggestions and comments

The tests to date are aimed primarily at comparing the VaR (and other outputs) from the factor model (+ residuals) against the “full-blown, pairwise” method. Such tests are necessary and useful. However, these tests do not give a flavor of how the VCV methodology forecasts/outputs “compare against actual realizations”. Such comparisons could be designed in a multitude of ways, each with particular strengths and weaknesses—we sketch two simple alternatives below.

One possibility might be to construct a Historical Simulation. This method would seem to have the advantages of being conceptually straightforward, relatively easy to implement, and free of distributional and parametric assumptions. Tests could be run on actual past bank portfolios (if such data are available) and/or hypothetical portfolios. Since names with limited histories raise difficulties, such names could be left outside the scope of such tests to begin with.



Comparisons of daily P&L (algebraic and squared, as an estimate of the daily realized conditional variance of the portfolio) against forecast portfolio variance (and hence VaR) are also likely to be informative. Visual inspection (plots) and statistical tests could be used. Many of the tests are applied to the portfolio at a single date. For tests aimed at uncovering “implementation errors,” this is adequate. For others, with results subject to sampling variability, larger samples would be desirable.

#### 4.1.1 Concentrated portfolios (section 8, p. 45)

For “concentrated” portfolios, the tests presented focus on equally-weighted exposures concentrated in a sector/industry. Alternatively, concentrated portfolios could also take the form of a few large exposures with high inter-correlations (stemming from sector or other factors); varying by spread level. Your thoughts?

#### 4.1.2 Extrapolation to less liquid names

Some of the properties that have been estimated from a sample of liquid names could potentially be quite different for less liquid names (e.g., liquidity-related differences in contemporaneous correlations). Your thoughts on how important (or not) such effects might be?

### 4.2 Specific Questions

- In section 9.1 (of the testing doc), the VaRs of the unhedged and hedged (with CDS) bond portfolios appear to be quite similar. How much of this is due to *IR* risk in the bonds and how much to CDS-bond basis? (I.e., if the *IR* risk were hedged out, then remaining variability should be due to CDS-bond basis, and hopefully, this is not too large.)
- In section 11 (of the testing doc), could the test have been done on just the portfolio of 50 extrapolated names? Would seem to focus on the issue at hand a bit better?
- Re: the results shown on page 14 of the presentation. Are these for actual bank portfolios or for hypothetical (e.g., averages of single-asset portfolios)?
- Of the bond-CDS basis contribution to VaR (p. 14 of the presentation), how much is due to the name-specific component?

- Statistics and time-plots of the CDS index bases would be helpful.
- Examples of how the VaR risk-decomposition measures are used for risk monitoring and risk management would be helpful.

## 5 Risks not captured in VaR

These questions are drawn from the methodology document and the presentation of April, 2005.

### 5.1 Jump to default

Following are some questions to make sure that our understanding is correct.

- The basic objective is to impute a rating based on the current spread, and then proceed by using the default probability associated with that rating (as published by Moody's, S&P.)—YES?
- The rating imputation "algorithm" (as described in the Methodology document and the presentation this month) requires a median/average spread for each rating. What data are used in calculating this median/average —just yesterday's; time-average, etc.?
- The default probability used for each rating bucket: only the most recent year's (as the doc seems to suggest) or a time-average (e.g., 1983 to 2004)?
- In the presentation table, AAA/AA has a zero historical default probability. In the subsequent calculations, is this value taken as is, or is it adjusted to some (small) positive number? [Historically, there have also been instances of "non-monotonic" (across ratings) realized default rates—which would have to be overridden.]
- The procedure used implicitly assumes that cross-sectional variation in CDS spreads is essentially attributable to variation in (market-perceived) default probabilities. In principle, CDS spreads could also differ because of differences in anticipated recovery rates (e.g., due to differences in seniorities of the reference assets; industry membership, etc.).<sup>1</sup> Is this likely to be significant? Does the desk apply differential recovery rates?

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<sup>1</sup>Aside from cross-sectional variation in "risk premiums", "liquidity" premiums, etc.

- In the simulation, the NPV conditional on default is treated as non-stochastic—i.e, the recovery rate is not random?
- For any scenario  $j$ , default of name  $i$  is statistically independent of MTMs of non-defaulting names?<sup>2</sup>

## 5.2 Intra-issuer curve risk

Estimate of relative importance and potential impact?

## 5.3 Correlation and Non-linear risks

The Spread vs. Correlation grid: please explain how it is constructed and interpreted; how it is used for risk monitoring; and how risk-management recommendations are then developed.

## 5.4 Independence of name-specific risks between Equities and Credit

At present, what are the difficulties in incorporating such correlation?

Estimate of the resulting potential misstatement of VaR?

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<sup>2</sup>Recognizing, as per your observation during our meeting, that, unlike a "banking book" with exclusively long credit positions, the impact of allowing such correlations might be very different (and potentially "undesirable") in a trading book.

Hi, Victor, we had some follow-up questions relating to Mortgage VaR, based on the Mortgage VaR docs dated April '05 and subsequent updates. Please deal with them when convenient (no rush on our side) and in your preferred format (written, phone call, meeting...). If you need clarifications, please drop us a line. Thanks.

1. Agencies/Prime (p. 3).

1.1 Some general questions regarding the Strats' model:

- + What is the typical length of history used to estimate the empirical durations?
- + How often are they re-estimated?
- + How stable are the empirical durations over time?

+ In computing the benchmark residual histories, does MRMA apply the empirical durations obtained from the current (prepayment) model to the entire history, or are the durations from the earlier model(s) applied to earlier dates?

1.2 As an indicative summary statistic, it would be helpful to see the historical correlation among the benchmark residuals---are those readily available? (Recognizing that your VaR now operates in a non-parametric HistSim setting)

1.3 We would like to better understand the rationale for proxying (page 4 & elsewhere). It seems like the Strats need sufficient history on a position to be able to estimate its empirical durations---i.e., they cannot use proxies. But, MRMA has to proxy. e.g., because such history is not long enough?

1.4 For Trust IOs & PO's (p. 7), are the Strat-supplied durations such that the dollar durations of IO + PO = dollar duration of the Passthrough? If not, is the assumption with respect to the residuals (that the IO + PO = Passthrough [in terms of prices and hence for projected price-changes] ) invoked to force this? What is the empirical relationship?

1.5 Residual risk of CMO/ Prime whole loan:

Our reading of the doc is that the OAS sensitivities are NOT empirical estimates, but model-based---is that correct?

The approach seems to assume that the OAS of the CMO product (tranche) is perfectly correlated with the TBA OAS? Is that correct? Empirically, what are the typical correlations between the OAS's of CMO tranches and of passthrough TBAs?

2. Options on passthroughs

The underlier (price of passthrough) is itself a fairly complex function of default-free rates and of (implied) volatilities of rates. How is the reasonableness of the delta-vega approximation (of the option price) assessed for non-local moves of these factors?

3. Model performance (testing doc)

+ Page 10 of the testing doc (April 2005) shows some results of using an updated prepayment model (from GS2002 to GS2004). While the VaR and stress test numbers appear to be relatively unaffected (agree?), the DV01 numbers (for the Mortgage desk) seem to change quite a bit. Any insights would be helpful.

+ Single-position backtests are shown in the document; they reveal that VaR exceptions do occur. Are there any helpful "explanatories" around these breaches (e.g., large joint moves in OAS and interest rates)? Across securities, do these breaches tend to be clustered or scattered in calendar time?

+ Are portfolio-level backtests also available?

4. Constant Maturity Mortgage products

\* May have a few questions after I try to better understand what these are.

5. Testing docs

\* will look through them & develop comments/q's.



## Notes on SIA's JTD proposal

Date: June 6, 2006

### 1 Outline

The SIA proposed a “a short-cut approach to generating a conservative estimate of the JTD capital charge.” Based on their handout at an industry-regulators meeting in April 2006, we could go over the following.

- Introduce the SIA approach and formula.
- Briefly sketch derivation of the formula
- Point out assumptions made
- Identify required inputs—observable, assumed.
- Open issues; implementation alternatives.
- Indicative sample results.
- What other tests and analyses should we request.
- Benchmarks—compare short-cut approach to what?
- Misc conceptual matters—liquidity; horizon

### 2 Overview of SIA's proposed approach

Page 8 of the April handout states the current version (Dec proposal revised in response to regulators' comments):

“ Select  $n_{hy}$  high-yield names and  $n_{ig}$  investment-grade names with the *largest LGD* (in dollar terms) among all names subject to default loss.<sup>1</sup> The capital add-on is the portfolio expected loss plus the square-root of the total scaled sum of squared LGD's with different multipliers for HY and IG.”

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<sup>1</sup>Short positions do not suffer a loss when the issuer defaults and hence are to be excluded.

$$\text{Tail Loss} = EL + \sqrt{\alpha_{hy} \times \sum_{i=1}^{n_{hy}} LGDHY_i^2 + \alpha_{ig} \times \sum_{i=1}^{n_{ig}} LGDIG_i^2} \quad (1)$$

The basic idea appears to be that some of these quantities will be “portfolio-sensitive”—i.e., will be refreshed as the portfolio changes, while others will be static or updated infrequently. Clearly, LGD’s are to be continually refreshed. The parameters  $\alpha_{ig}$  and  $\alpha_{hy}$  subsume many portfolio and position-specific features—but unclear how often this is to be refreshed. The numbers  $n_{ig}$  and  $n_{hy}$  are *not* the actual numbers of positions, but are inputs (either subjective or estimated via an algorithm)—unclear how often they will be re-estimated.  $EL$  is the expected loss; the document is not specific as to whether this is to be a static or variable quantity. The sample calculations indicate that  $EL_p = EL_{ig} + EL_{hy}$  is computed with respect to the actual portfolio, and not  $n_{ig}$  and  $n_{hy}$ .

## 2.1 General assessment

In general, the determinants of loss in a credit-risky portfolio (default probabilities, credit migration probabilities, LGD’s, correlations, etc.) can be stochastic with complex dependence/correlations. So generating loss distributions requires time-consuming simulations. These might be used, e.g., for computing economic capital on a banking book portfolio, where risks are measured over fairly long horizons (at least 1 year and perhaps up to maturity). In such analyses, tail losses can depend on: (i) correlated defaults and migrations due to common systematic factors—individually small exposures that experience loss jointly; (ii) idiosyncratic events to large exposures; (iii) combinations of (i) and (ii).

In contrast, the current exercise has a very narrow focus—potential value-losses (risks) arising due: (i) solely to default (in the legal sense), (ii) over a very short horizon. Over short horizons, correlated spread moves and even correlated moves to distress are possible, but correlated *defaults* are likely to be rare. As a result, tail losses are likely to be driven the possibility of joint idiosyncratic events, rather than by systematic factors. That is the thrust of the SIA approach, which focusses on large individual exposures and dispenses with modelling correlations and so on. So, given all these considerations and the limited objectives, in my judgment, the overall approach represents a reasonable pragmatic compromise. However, there are several open implementation

issues, as well as some questionable conceptual matters. Also, I am unable to reproduce many of their numbers.

The next section sketches the conceptual origins of the formula, the ingredients of the multipliers  $\alpha_{hy}$  and  $\alpha_{ig}$ , etc. We start from a general specification and work down to the particular, pointing out the assumptions made along the way. After that, preliminary results provided in the SIA proposal are reviewed.

### 3 Details—formula origins, etc.

#### 3.1 General specification for credit loss

A fairly general way to describe the (uncertain) dollar loss on a credit-risky position is the following:

$$\tilde{L}_i = \begin{cases} \widetilde{EAD}_i \times \widetilde{LGD}_i & \text{if default (prob.} = \tilde{p}_i) \\ 0 & \text{if no default (prob} = (1-\tilde{p}_i)) \end{cases} \quad (2)$$

The subscript  $i$  stands for the  $i$ 'th position, the  $\sim$  indicates a stochastic or random variable.<sup>2</sup> Thus, in the general specification, the determinants of credit loss may all be stochastic with differing properties across positions; there may also be dependence/correlations among the stochastic variables at the position-level and across positions. Generating portfolio loss distributions, particularly tail quantiles, under such general specifications usually requires simulation (and lots of scenarios!).

To obtain tractable, analytic expressions, assumptions along one or more of the following lines are usually made: (i) non-randomness—assume some or all of the determinants are non-stochastic; (ii) stochastic dependence—allow for randomness (perhaps only in some variables) but disallow dependence across variables; (iii) homogeneity—assume properties (perhaps only of some variables) are the same across all positions; (iv) assumptions on stochastic properties—distributional assumptions. The goal of these assumptions is to permit easy calculation of the mean and the variance of the portfolio loss; then, tail quantiles could also be easily estimated (possibly with additional distributional assumptions).

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<sup>2</sup>Here, LGD is a loss rate; elsewhere, it also stands for dollar loss—sorry for the confusion.



### 3.2 Basic SIA assumptions, notation, etc.

- The SIA approach assumes that all determinants are non-stochastic. Note that although the default probabilities are assumed to be known and fixed, default events themselves are unpredictable, and may be “correlated” across positions. All subsequent derivations are based on this assumption.
- Treatment of EAD is unspecified.
  - ☞ Should confirm what is to be done.
- LGD in their notation stands for dollar loss.

### 3.3 Expressions for mean and variance of loss

#### Single position

$$\text{Exptd. Loss}_i = EL_i = p_i LGD_i$$

which is a proportional loss if  $LGD$  is a loss rate, and a dollar loss otherwise.

$$\text{Variance of Loss}_i = V_i = p_i LGD_i^2 - (p_i LGD_i)^2 = LGD_i^2 \times p_i(1 - p_i)$$

#### Portfolio

Let  $N$  be the number of positions in the portfolio. Then the (uncertain) portfolio loss is just

$$L_p = \sum_{i=1}^N L_i$$

$$EL_p = \sum_{i=1}^N EL_i = \sum_{i=1}^N p_i LGD_i \tag{3}$$

$$\begin{aligned}
V_p &= \text{Variance}[L_p] = \text{Variance}\left[\sum_{i=1}^N L_i\right] \\
&= \sum_{i=1}^N V_i + \sum_{i=1}^N \sum_{i,i \neq j}^N \text{cov}(L_i, L_j) \\
&= \sum_{i=1}^N V_i + \sum_{i=1}^N \sum_{i,i \neq j}^N \rho_{ij}^{def} \sqrt{V_i} \sqrt{V_j} \\
&= \sum_{i=1}^N LGD_i^2 \times p_i(1-p_i) + \sum_{i=1}^N \sum_{i,i \neq j}^N \rho_{ij}^{def} \sqrt{LGD_i^2 \times p_i(1-p_i)} \sqrt{LGD_j^2 \times p_j(1-p_j)}
\end{aligned} \tag{4}$$

Here,  $\rho_{ij}^{def}$  is the pairwise “default correlation”.<sup>3</sup>

Under the SIA proposal, equations 3 and 4 are (essentially) the ones used to compute the mean and variance of the **actual** portfolio, with one small tweak. The tweak is that the actual portfolio is first subdivided into subportfolios of IG and HY names, and that  $\rho_{ij}^{def} = 0$  if  $i$  and  $j$  are not in the same subportfolio. Thus, the subportfolio variances are calculated separately as per the above formula and then added together:

$$VL = VC_{ig} + VC_{hy} \tag{5}$$

☞ *Not clear why HY and IG are done separately.*

### 3.4 SIA “equivalent portfolio” expressions (p.15)

The above formulas depend on position-specific information ( $p_i, LGD_i, \dots$ ). For some purposes, it may be helpful to perform calculations on a hypothetical portfolio which has “similar” characteristics but does not depend on position-specific data. The SIA proposes to do this as follows.

1. From each subportfolio, pick  $n_{ig}$  and  $n_{hy}$  names with the largest LGD’s.
  - ☞ Leaving open the issue of how the numerical values of  $n_{ig}$  and  $n_{hy}$  are to be determined. More on this later.
2. Homogeneity: consider  $n_{ig}$  and  $n_{hy}$  hypothetical positions with *identical* default probabilities; all  $n_{ig}$  positions have default probability =  $P_{ig}$  and all  $n_{hy}$  positions have default probability =  $P_{hy}$ —P’s to be determined.

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<sup>3</sup>Which is a different concept than the “asset correlation” discussed elsewhere, e.g., with CDO models.

3. Zero correlation: Assume that  $\rho_{ij}^{def} = 0$  for all these hypothetical positions.
4. The hypothetical positions have the LGD's corresponding to the names picked in step 1—i.e., heterogeneity is allowed with respect to LGD.
5. Under these assumptions, the subportfolio variance (equation 4) becomes, e.g.,  $P_{ig}(1 - P_{ig}) \times \sum_{i=1}^{n_{ig}} JTD_i^2$   
 ☛ Assuming that JTD is the same as LGD.
6. Select  $P_{ig}$  such that  $P_{ig}(1 - P_{ig}) \times \sum_{i=1}^{n_{ig}} JTD_i^2 = VC_{ig}$  (see equations 4 and 5). Ditto for  $P_{hy}$ .  
 ☛ Being a quadratic equation, there will be two roots. For the well-behaved cases, one will be smaller than 0.5 and one greater than 0.5. The “common-sense” choice would be the smaller one—but the EL would be much bigger with the other choice!!

Observe that only the variance of the original portfolio is matched; not even the EL will be the same. More importantly, the tail quantiles may differ as well.

### 3.5 Specifying tail quantiles

The tail quantile can be related to the mean and standard deviation by

$$Q99 = \mu + K99\sigma$$

For many common distributions, given the mean ( $\mu$ ) and standard deviation ( $\sigma$ ),  $K99$  is easily found (via standard software, tables, etc.). Here, we write

$$\begin{aligned}
 Q99_{ig} &= EL_{ig} + K99_{ig} \sqrt{P_{ig}(1 - P_{ig}) \times \sum_{i=1}^{n_{ig}} JTD_i^2} \\
 &= EL_{ig} + K99_{ig} \sqrt{P_{ig}(1 - P_{ig})} \times \sqrt{\sum_{i=1}^{n_{ig}} JTD_i^2}
 \end{aligned} \tag{6}$$

Now consider a simplified version of the SIA’s Tail Loss formula, dealing with only one subportfolio.

$$\begin{aligned}
 Q99_{ig} &= EL_{ig} + \sqrt{\alpha_{ig} \times \sum_{i=1}^{n_{ig}} JTD_i^2} \\
 &= EL_{ig} + \sqrt{\alpha_{ig}} \times \sqrt{\sum_{i=1}^{n_{ig}} JTD_i^2}
 \end{aligned} \tag{7}$$

Comparing the two equations, we see that  $\sqrt{\alpha_{ig}} = K99_{ig} \sqrt{P_{ig}(1 - P_{ig})}$ , i.e.,  $\alpha_{ig} = K99_{ig}^2 \times P_{ig}(1 - P_{ig})$ —where K99 here is C(99) in the SIA notation.

☛ Check whether  $\alpha$ ’s are to be refreshed “regularly”—this basically requires performing step 6 in subsection 3.4 regularly, a simple operation.

#### Choosing a reference distribution

Credit loss distributions are thought to be “right-skewed”—they exhibit high probability mass in the region of “small” losses, low probability mass in the region of high losses. This renders tail quantiles quite sensitive to the choice of quantile (the difference, in loss terms, between adjacent quantiles is larger at the tails), specification of tail behavior, etc. The SIA proposal suggests using the *Beta* distribution.

A *Beta*-distributed random variable can only take on values between 0 and 1—convenient for a Loss distribution (which is bounded between 0 and 100%).<sup>4</sup> The distribution is characterized by two “shape” parameters,  $a$  and  $b$ . Depending on the values of these parameters, the distribution can assume a wide variety of shapes including symmetric, left-skewed or right-skewed. However, for parameter values generally encountered in credit modelling, it is likely to be right-skewed.

#### Illustrative calculations

Page 17 of the Appendix provides sample values of C(99.9). It says for  $n=20$  and  $P=10\%$ , C(99.9) based on the *Beta* distribution is 3.37. The information given is not complete, so one has to make some guesses in attempting to reproduce this number. Here’s what I did.

I assumed a portfolio of clones with an investment of \$1 in each, for a total investment of \$20—this is used to express the portfolio dollar loss as a proportional loss. I.e.,  $\widehat{L}_p = \sum \widehat{L}_i / \$20 =$

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<sup>4</sup>Conversion of the dollar loss to a proportional (or percentage) loss requires a denominator—e.g., face value or initial commitment.

$\sum \widehat{L}_i/n$ . Assume an LGD rate of 50% and zero default correlations. The expected loss,  $EL_p = \sum \$EL_i/n = P \times LGD = 0.10 \times 0.50 = 0.05$ . The portfolio variance is

$$\begin{aligned} V_p &= \mathcal{V} \left[ \widehat{L}_p \right] = \mathcal{V} \left[ \sum \widehat{L}_i \right] / n^2 \\ &= \sum \mathcal{V} \left[ \widehat{L}_i \right] / n^2 = n \times (P(1 - P) LGD) / n^2 \\ &= (P(1 - P) LGD) / n \end{aligned}$$

This turns out to equal 0.001125. The mean and variance of a *Beta*-distributed variable are nonlinear functions of the shape parameters  $a$  and  $b$ . Solving these equations simultaneously yields  $a = 2.06$  and  $b = 39.16$ . Plugging these into a program (I used *Mathematica*) for a *Beta*-distribution yields the following statistics:

Mean = 0.05, SD= 0.033541, Q01= 0.00408396, Q05= 0.00953281, Q50=0.042874, Q95=0.114881, Q99=0.156462, Q99.9=0.210181.

C(99.9) should be: (Q99.9 -Mean)/SD; I get a value of 4.78 whereas the SIA doc reports 3.37.

The implied  $z$ -value =  $\mu + K99\sigma = 0.05 + 3.37 \times 0.0335 = 0.163$ . The cumulative probability of attaining this value is 99.24%—i.e., the “99.24th” quantile.

☛ Follow up?

Finally, note the tail behavior—the distance between Q99 and Q99.9 is greater than that between Q95 and Q99; quantile selection matters.

#### Extension to multiple subportfolios

The SIA’s proposed extension to multiple subportfolios does not agree with the theory (as I see it—perhaps there’s some explanation). In equation 6 one should use the overall portfolio standard deviation, and compute a *single* multiplier (K99) for the entire portfolio. I don’t think the theory for computing overall variances extends to other statistics such as quantiles. Observe also that the earlier (Dec) approach used a single portfolio—perhaps explaining the *ad hoc* nature of this extension. Specifically, if the K99’s (or equivalently, the C(99)’s) were the same for IG and HY, then the SIA formula amounts to assuming the IG and HY losses are uncorrelated (so the usual variance formulas apply)—otherwise the statistical theory is unclear.

☛ Follow up?

### 3.6 Determining $n_{ig}$ and $n_{hy}$

This appears to be an open implementation issue.

- ☛ Inquire whether any sensitivity analyses have been conducted with respect to alternative approaches to determining these numbers?
- ☛ Clarify what method is being used, once selected.

For some specialized cases (with some extreme homogeneity assumptions) can work out analytical expressions relating  $n$  as a function of the original portfolio's  $N$  and default correlation structure. Details on Moody's diversity score approach available if interested.

Alternative approaches also take the route of constructing “equivalent” portfolios; the criteria for equivalence may differ—e.g., both first (EL) and second (variance) moments may require to be matched.

## 4 Sample results

The SIA doc includes sample results on pages 10—12. For some stylized portfolios, they illustrate how the  $n$ 's may be chosen (judgmentally) and their impact, the effects of different assumptions about horizons, default correlation, and so on.

### 4.1 P. 10 results

P. 10 shows the results for zero correlation and one year horizon, for portfolios with different distributions of LGDs/JTDs (the different panels). Across the panels/portfolios, since the horizon is the same, the same effective PD applies. The “NumTop” (the  $n$ 's) vary to reflect the varying JTD distribution—i.e., the equivalent portfolio is different across the panels. The row “rtSumSq” is  $\sqrt{\sum_{i=1}^{NumTop} JTD_i^2}$ . For reasons I don't understand,  $\alpha_{hy}$  is the same across all panels, but  $\alpha_{ig}$  for the first is different from that of the remaining four. Changing composition of the original portfolio means that the mean and variance of the original portfolio loss are changing as well, so if the  $\alpha$ 's were calibrated to each portfolio, they would be changing as well; the invariance of the  $\alpha$ 's could be the result of: (i) carefully constructed situations so the  $\alpha$ 's remain the same; (ii) exogenous, portfolio-insensitive  $\alpha$ 's. I can reproduce the “rtSumSq” entries and the EL's, but

not the  $\alpha$ 's or the Tail values.

### Panel 1

- “rtSumSq” for HY =  $194 = \sqrt{15 \times 50 \times 50}$ . Ditto for IG.
- EL<sub>HY</sub> =  $15 \times 50.10 = 75$ .; EL<sub>IG</sub> =  $15 \times 50.005 = 3.75$ ; EL<sub>P</sub> = EL<sub>IG</sub> + EL<sub>HY</sub> =  $78.75 = 283 - 204$
- Tail = EL<sub>P</sub> +  $\sqrt{0.09 \times 194^2 + 1.022 \times 194^2} = 283$

### Panel 2

IG now consists only of 2 large exposures—NumTop for IG is now 2. No data changed for HY.

- “rtSumSq” for IG =  $\sqrt{500^2 + 250^2} = 559$
- EL<sub>IG</sub> =  $(500 + 250) \times 0.005 = 3.75$ ; EL<sub>P</sub> = 78.75.
- Tail = EL<sub>P</sub> +  $\sqrt{0.101 \times 559^2 + 1.022 \times 194^2} = 343$ .

It is not explained why  $\alpha_{ig}$  is changed to 0.101.

### Panel 3

HY now includes 5 large exposures—but NumTop for HY is 6, not 5 (?). IG data same as panel 1.

- “rtSumSq” for HY =  $\sqrt{1000^2 + 700^2 + 500^2 + 400^2 + 200^2 + 50^2} = 1394$ .
- From the difference between Tail and (Tail-EL), EL<sub>P</sub> = 334. However, based on NumTop of 6, EL for HY = 285; adding EL<sub>IG</sub> of 3.75 only gives 288. It seems EL<sub>HY</sub> is being computed on all 15 exposures, rather than just the NumTop exposures:  $285 + 9 \times 50 \times 0.1 + 3.75 = 334$ .
- Tail = EL<sub>P</sub> +  $\sqrt{0.101 \times 194^2 + 1.022 \times 1394^2} = 1744$ .

### Panels 4 & 5

In Panel 4, the HY portfolio is the same as Panel 3's; now the IG portfolio also includes 5 large exposures—NumTop's for HY is 6, and 5 for IG. As expected, the expected loss and tail loss go up.

In Panel 5, large short positions are also included in both the HY and IG portfolios. They have no effect on the “variance term” , but do reduce the expected loss.

## **4.2 P. 11 results**

On this page, HY default probabilities are (linearly) scaled to a 3-month horizon and IG default probabilities are scaled to a 2-week horizon. Different  $\alpha$ 's reflecting the revised probabilities are used. The portfolios follow the same sequence as p.10.

## **4.3 P. 12 results**

Here, a 3% default correlation is introduced. This affects the PD<sub>eq</sub> to be used, as per step 6 in subsection 3.4, since the original portfolio variance now includes the covariance terms. For HY, I get a PD<sub>eq</sub> of 3.59% rather than the 3.69% reported in the SIA doc.

# **5 Miscellaneous**

## **5.1 Liquidity & Horizons**

My understanding of the liquidity—horizon nexus is this: More liquid positions can be exited, or their risk defeased, more readily (or at more reasonable cost). However, VaR analysis is concerned with eventualities following fairly large market moves. And “liquidity” is not a permanently endowed property, but changes as position-characteristics change, as market conditions change, etc. So, e.g., if an IG name defaults, its liquidity is not an IG-liquidity any more. What, then, is the relevance of the horizon adjustment?



**Subject:** Follow-up questions on VaR, Event Risk and Risk Appetite

**Date:** June 16, 2005

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Front Office risk factors & sensitivities vs. VaR risk factors:

- For purposes of VaR (and related) calculations, are sensitivities, etc., derived from the same FO models used by traders/marketing; or, might they be from alternative models/formulas better suited to VaR (computationally faster, represented in terms of observable risk factors, etc.)?
- If the former: For certain FO models, the underlying risk factors may have no direct observable counterparts (e.g., a term structure model utilizing Principal Components), and it therefore becomes difficult to use such FO risk sensitivities directly for VaR purposes. We would like to better understand your solutions/approaches to this potential problem, with reference to specific products/areas [in addition to those noted subsequently].

✱Event Risk—general:

Generally, what are the criteria in determining which products should be subject to event risk? And, how is the “numerical” specification of the event determined?

✱Aggregation of market, event and counterparty risks:

For a given Business, what is the assumption regarding Events and Event Risks *across* regions (Americas, Europe, and Asia)?

## Part I

# Document-specific questions

## 1 From: Risk appetite, risk equity presentation, May 24, 2005

P. 13, issue-specific risk:

Should the expression for  $\delta_{t2}$  read

$$\delta_{t2} = \sqrt{\sum_{i=1}^N (\epsilon_{t2}^i)^2 / N}$$

where  $N$  is the number of bonds in the bucket.

✳P. 15, IRD instrument mapping/bucketing:

- Are instruments mapped to the bucket corresponding to *contractual maturity*? I.e., only to *one* point on the yield curve?
- Potential issues therefrom for instruments with early exercise, cancellation features?

✳P. 15, IRD Nonlinear risk—curve shift:

- We'd like to better understand the operational aspects of this calculation. E.g., is it something as follows. A *parallel* shift is applied to the current/observed yield curve, which then becomes the market input for the FO model (possibly in conjunction with a perturbed vol curve), and instrument valuations follow.
- Application of a non-parallel shift would, in principle, result in a different valuation. So, there would be some mis-valuation for historical realizations of non-parallel yield curve moves.
- Your thoughts on the materiality of such effects?

✳P. 15, IRD Vol. shifts:

- Is the FO vol sensitivity compatible with the “vol risk factor” used in the HistSim? (E.g., if the FO uses a multi-factor term structure model, the FO vol sensitivities are with respect to those model factors, which may not be the same as what is observable.)
- My understanding from the docs (and our meeting) is that only one point on the vol term structure is used. Could you please confirm?
- Re: the regression estimation of the vol term structure. How much history is used for this purpose? How often is it re-estimated?

- Empirical evidence suggests the existence of particular correlation patterns across the term structure of implied vols [higher correlation among like-maturities]. The bank's single-factor approach does not accommodate this. Your comments on the relevance and potential mismeasurement for the bank's portfolio?

✳P. 15, Resi Mortgage:

- KRDs are OADS?
- Do issues of data-quality arise for Agency TBAs with WACs far away from current coupon (e.g., for series with WAC > 8%)?
- Could you please elaborate on how the CMO tranche convexity factors were derived?

✳P. 27, Scope of VaR: Of the various items listed under “what’s not captured or not captured well”, we would like to better understand: (i) the products/areas where they arise; (ii) reasons and nature of current limitations; (iii) how was materiality assessed; (iv) is this an exhaustive or just a sample list; (v) plans for improvement.

✳P. 15, Munis:

- Re: the volatility of particular sub-markets (muni HY, muni taxable, etc.) for VaR purposes. Are these included via the “issue-specific” treatment for High-Grade credit—viz., volatility by bucket and Normal draws?
- Relative to the broad ratings-maturity buckets used, are any other issue-specific variations sufficiently important to consider (for VaR)?
- Re: the BMA swaptions. Are these modelled, e.g., by inferring the term structure of BMA/Libor ratios from the current BMA swap curve, then viewing that ratio as deterministic and treating the product as a percentage-of-Libor swaption?

✳P. 15, FX:

- For the biggest volume/risk option products, what are the models used: (i) by the FO; (ii) for VaR?

- As with IRD, the only HistSim risk factor for implied vols is an ATM, “pivotal” maturity, vol series and all the other vols follow via some “beta-weighting” scheme?
- Are vol moneyness patterns ignored for VaR reveals?

✱P. 15, Inflation products:

## 1.1 Credit

- High grade CDS: What is (are) the HistSim risk factor(s) for the CDS premium? Identical to a bond of the same issuer, (including the “issue-specific” component)? Is there an additional risk factor for CDS-bond basis (and term structure thereof)?
- High Yield CDS: The mapping procedure is not quite clear.
- Are CDOs and CDS’s included in the Event Risk calculations?
- What are the underliers for the EMG options—sovereign bonds; emerging market corporate loans/bonds?
- CDX swaptions: For CDX swaptions: what are the desk-level risk metrics used; are they captured in VaR and/or Event Risk; if captured in VaR, what volatility risk factor would be used relative to the vega.

## 1.2 Event risk

### 1.2.1 p. 30 High yield

- The 1-year default probability estimate is used? What is the source and history used for this estimate (e.g., average of last 10 years’ annual transitions)?
- Is the loss distribution carried out literally by enumerating possible joint outcomes as per the numerical example; or, via simulation of numerous “scenarios”, applying, in each scenario, a Bernoulli trial to each issuer.
- Any plans to move to stochastic recovery? Correlated defaults?
- Are credit-derivatives subject to the same forces?

- How are short positions treated?

### **1.2.2 p.33 High Grade**

- RE: estimating the P&L impact from spread widening resulting from rating downgrade—is some kind of a ratio of “average” rating-level spreads used to scale the bond’s current spread; or is each bond’s spread assumed to move by just the difference in average rating-level spreads (common for all bonds); or, some other method?
- Any plans to consider “correlated” migrations?
- Are credit-derivatives subject to the same forces?
- How are short positions treated?

### **1.2.3 p. 34 Real Estate**

- Re: aggregation across MSAs (see p. 16 of May 17 presentation). Text says aggregation is done similarly to High Yield. However, High Yield events are binary in nature, whereas this analysis yields MSA-level P&L “HistSim” vectors, which are not binary nor parametric. I’m unclear as to what is done.

### **1.2.4 p.35 Merger arbitrage**

- Are all positions put on post public signals of impending merger?
- Is deal break the only relevant risk? Are there trades which lose if the deal completes?
- Are all relevant parts of the trade—i.e., cash *and* possible option positions—factored into the Event Risk calculations?

### **1.2.5 Sub-prime mortgages**

### **1.2.6 Dividend risk for equity derivatives**

- Are there specific trade features—e.g., for convertibles, dividend swaps, etc.—that make the dividend risk especially significant?

- Such large changes, if “permanent”, are likely to be accompanied by largish changes in the underlying stock price (due to “information content” of dividends; i.e., not just a redistribution between capital gains and dividends). But your analysis holds constant the stock price?

### **1.2.7 Fund derivatives**

- We would like a little more detail on the contractual structure, payoffs, etc. of the fund derivatives in the bank’s books.
- Could you please discuss the mechanisms for trading (breadth, depth of market) and price-discovery (frequency—e.g., monthly?) for the underlying funds, and their implications for hedging/replication of the fund derivatives.

### **1.2.8 Counterparty risk**

- Follow up with Michelle.

## 1 Further questions

The firm contends that the PC-inspired methodology adequately captures the “major” types of movements in equity vol surfaces that are typically observed. Accepting that for the moment, it is conceivable, though, that the firm’s principal *risk exposures* are to somewhat different types of vol-surface movements. E.g., the firm may have hedged away most of the exposure to “parallel” shifts in the vol term structure (by expiration/maturity; across ATM and possibly other moneyness levels), which roughly corresponds to the first PC. It would be helpful, therefore, to have some quantitative and qualitative metrics demonstrating that: (i) the bulk of the bank’s exposure is to the types of deformations in the vol surface that are modelled; and (ii) exposures to non-modelled deformations are small.

More generally, what does the firm regard as the principal sources/areas of potential mismeasurement under this framework?

### Assorted “technical” questions

1. How many vol surface risk factors are eventually used for each underlier? Is it 11 (one for each moneyness level)  $\times$  4 =44?
2. What are the kinds of weights used in the estimation of the daily  $c_i$  coefficients? What are the typical types and magnitudes of differences between the  $c_i$  and the originally estimated (i.e., from the 8 by 8 ATM covariance matrix) eigenvectors?
3. Would (if so, how) unusual moves in the vol surface be reflected in the PC-history actually used for VaR calculations?—e.g., if a smile rather than a skew developed for an equity over some days? Or, (perhaps more implausibly), a hump developed in the ATM term structure? Seems like the 4-factor PC history would simply assert that such an event, even if present in the raw data, would never occur—agree? The corrolary question is the likelihood of such events (in a VaR context) and materiality of dollar exposures to such events.
4. Want to confirm that the reval approach ignores cross-partials or interactive impacts on valuation resulting from joint moves in the PC’s; I.e., the reval for a joint move,  $\Delta V(PC1 = z1, PC2 = z2, PC3 = z3, PC4 = z4)$  is approximated as the sum of the “partial” revals:

$\Delta V(PC1 = z1; PC2 = 0, PC3 = 0, PC4 = 0) + \Delta V(PC1 = 0; PC2 = z2; PC3 = 0, PC4 = 0) + \dots$ —yes? What products are most affected by this approximation?

5. Would looking at the scenario reveals (say at  $\pm 1\%$  and  $\pm 5\%$ ) for the portfolio across PC's be a reasonable way to gauge the relative importance of each PC (type of vol deformation) in the *exposure*-space?
6. We expect that the firm will continue to investigate the reasonableness of applying SPX-based PC coefficients to individual equities (small-cap; less-actively traded).



**From:** P.C. Venkatesh

**Subject:** Comments on “Merrill Lynch’s Company VaR and Event Risk Methodology” (9/3/2004)

**Date:** 12/10/2004

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Comments based on Value-at-Risk Analytics doc dated Sep 3, 2004. Section 1 (General Comments) refer to things I *didn't* see in the doc, and which are also quite important to forming an overall assessment. Section 2 (Specifics) contains comments on specific aspects of the methodology, as I understand it from the doc. At this point, I have not ordered them in any way with respect to potential importance, impact, etc., since these comments are, at this point, more for internal discussion than anything else.

## 1 General Comments

- The doc contains very little discussion of how specific types of instruments are (re)valued, the other key component of a VaR methodology.
- It would be helpful to have an idea of the range of products covered— to assess whether relevant risk factors are included, and to assess the reasonableness of reval formulas (of approximations used, etc.)

## 2 Specifics

Some specific questions, observations and comments (in same order as doc).

### 2.1 Position Reval

Generically, to revalue an instrument the bank proceeds as follows:

1. Define a set of *Standard Shocks* for each risk factor (Table 1, p.4)
2. Compute  $\Delta V$  for an instrument for each (applicable) risk factor at the set of *Standard Shocks*. This is a univariate or “partial” calculation in that while one factor is perturbed, the other factors are held constant (**at what levels—“current”?** **If so, they have to be re-computed every day.**)

3.  $\Delta V$  for intermediate values of the risk factor are obtained by linear interpolation or extrapolation.

- Any bank docs/discussions/analyses on whether the “grid of shocks” is fine enough (e.g., for instruments with kinked payoffs; digitals, etc.)?
- Any bank docs/discussions/analyses on ignoring cross-partial effects across risk factors (given the width of the grid, my guess is that linear interpolation within the “hypercube” of risk factors may potentially substantially mis-estimate the full effect)?

## 2.2 “Historical Inference”

- The firm uses a one-week horizon as the firm-wide standard for VaR. One-week (5-day), non-overlapping changes over a four-year history are used to generate future possible factor outcomes. Hence, there are at most  $4 \times 52 = 208$  statistically independent historical data points; since Historical Simulation (HS) is used to generate factor outcomes, the 1-week ahead portfolio value distribution is also built upon at most 208 data points. With so few observations, the precision of estimates of tail quantiles is always an open question.
  - Bank’s internal discussions, analyses, on this point?
  - Is this the intent to keep adding to the history or maintain a 4-year cutoff?
- Two week VaR uses one-week changes scaled by  $\sqrt{2}$ . Strictly correct only for processes such as random walks.<sup>1</sup> As a practical matter, probably a relatively minor point, except that it is at odds with the “distribution-free” aspect of HS.
- One-day VaR for backtesting.
  - criteria for “model-soundness”?;
  - Vs. 5-day VaR for internal RM purposes—rationale; statistical connection between the two; and hence...
  - actions if backtest fails?

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<sup>1</sup>And would be incorrect, e.g., for mean-reverting or non-constant volatility processes.

### 2.3 Enhanced simulation: Antithetical observations

One reason the bank wants to use this is to offset any trends (e.g, manifested in the average weekly change) and restore a zero mean. But this could be just as easily done by subtracting out the sample mean (or the median) from each observations.

Some things I don't like about this:

- The “natural” probabilities of the univariate antithetic outcomes may be much different than that of the realized ones—e.g., in my view, the opposite of the Oct '87 stock market crash is much less likely, because “panic buying” is much less likely. Likewise, are decreases in credit spreads likely to be as swift and as sharp as increases? Are oil price decreases likely to be as swift and sharp as increases? Of course, these are empirically testable propositions.
- In the same vein, for joint (cross-factor) moves, the forced symmetry, relative to the actual observations, may be quite unrealistic. E.g., contagion/correlations across market sectors and internationally during “bear”/down markets vs. bull/up markets are likely to be rather different.
- Not clear how they deal with variables that should remain positive—e.g., for the **Spread Risk Factor**, level-differences are used to generate the history of spread-changes. While large spread increases cause no problems, applying the antithetical observation could result in spread decreases large enough to make the associated rate level negative.
- HS requires that the pool from which (simulation) draws are made consist of observations which are statistically mutually independent. It seems this requirement would not be satisfied when the antithetical observations are commingled with the original observations.
- For each risk factor, the “padding” of the distribution causes each tail quantile to be associated with a less extreme observation (relative to using only the original observations). E.g., with 500 original observations, the 1st quantile is the 5th smallest observation; but when combined with the antithetical observations, the 10th smallest observation becomes the 1st quantile.<sup>2</sup>

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<sup>2</sup>For a portfolio monotonically related to a single risk factor, the impact is clear. For more general portfolios, the VaR scenario may be associated with an interior point in the factor distribution, so the impact is less clear.

## 2.4 “Assumptions, . . . :

### 2.4.1 “Interest rate risk factor (p. 12)”

Doc says “For *simplicity*,  $r_{\text{current}}$  is taken to be the *latest* observation . . . . This observation may be *updated* . . . .”

#### Comment:

I understand this as follows. Per their description, the simulated rate level  $s$  days ahead (today is day 0), for the  $k$ 'th scenario,  $r^k(s)$ , *should* be computed as  $r^k(s) = r(0) + \sqrt{r(0)} \Delta z^k$ , where  $\Delta z^k$  is the simulated shock for the  $k$ 'th ; where the  $\Delta z$ 's are computed from the historical database of rate levels as  $(r(j) - r(j - m))/\sqrt{r(m)}$ , ( $j$  is some date in the historical series and  $m$  is the step-size (1 day, 5 days, etc.)).

So, the qualifying statement suggests that the second term on the right-hand side is instead computed as  $\sqrt{r_{\text{last}}} \Delta z^k$ .

- **Confirm this interpretation.**
- Discrepancies relative to the “correct” application depend on the divergence between  $r(0)$  and  $r_{\text{last}}$ . The doc. suggests that the necessary “update” *may* occur, if, e.g.,  $r(0)$  and  $r_{\text{last}}$  differ by 50bp. **Do we need a firmer statement from the bank here?**

### 2.4.2 “Spread risk factor (p. 15)”

- Level differences are assumed to appropriately characterize spread evolution. Thus, it seems possible that certain antithetical observations could give rise to “perverse/counter-intuitive” outcomes in the simulated levels—e.g., negative rate levels, etc.
- How many different subcategories, etc.?

### 2.4.3 “Volatility risk factor (p. 17)”

Implied vols for which categories of risk factors? Term structure and moneyness?

## 2.5 5. Historical data:...

- The key responsibilities and functions seem to reside with the Market Risk Managers (selection of appropriate risk factors/time-series; “accuracy” of the entity-VaR); the VaR analytics group seems to facilitate the implementation, rather than serve as an “independent” risk measurement unit. **Any discussion on this point?**
- Do we have more details on the data: a list of the risk factors/time-series used (plus whether they are “direct” or derived; proxies)
- Examples of VaR impact analyses—cases of material impact

## 2.6 6. Event risk analysis

- Discussion around why these were selected? Are there other shocks (“hypothetical” or realized) that are possibly relevant to the typical current portfolio?
- Limits? Actions?
- textit “Adjustment for re-balancing”

Any analysis, discussion of the potential approximation error from the bank’s procedure?

**From:** P.C. Venkatesh (on behalf of OPSRA staff, SEC)

**Subject:** Suggested additional tests of the APT model

**Date:** October 5, 2005

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## 1 Background

### The APT model in brief

The APT model is a multi-factor model of equity returns. It is estimated using weekly returns of a large “universe” of traded stocks, with wide coverage across the spectrum of industries, locations, capitalizations, etc. Morgan Stanley receives from the vendor the following inputs for VaR calculations: history of daily factor moves, factor loadings/coefficients for each firm covered, idiosyncratic variance.

### Tests presented by Morgan Stanley

Morgan Stanley presented tests to assess three major assumptions of the APT model: (i) the factors are mutually uncorrelated; (ii) the mean value of the residual is zero; and (iii) the specific risk factor is uncorrelated with all of the factors. Morgan Stanley concluded that these assumptions were generally satisfied.

Morgan Stanley also compared, for a sample of 100 firms over a 250-day period, the volatility of “realized residuals” (more on this definition below) against the APT-supplied volatility. Morgan Stanley concluded that the volatilities were generally comparable. At the same time, Morgan Stanley observed that, over the sample period, observed returns appeared to exhibit a higher volatility than APT returns. A possible explanation for this is that the APT factor-model had been estimated over some longer period of more volatile equity returns. Since the vendor does not supply the “raw” data, Morgan Stanley is unable to easily re-estimate the model to test this more rigorously—a potential drawback of relying on a vendor model.

Morgan Stanley also displayed some VaR-related calculations. One set consisted of the relative contribution of specific risk to total VaR.

☛ Some of these numbers require clarification. On page 14, for IED, specific risk as a proportion of *total* VaR is shown to exceed 100% on certain dates. While presumably not impossible under

a HistSim method, this still merits further explanation.

☛ For PDT, specific risk is quite routinely greater than 100% of VaR—but is this total VaR or just the VaR-exSpecificRisk; if the former, it is again counter-intuitive.

The second set consisted of backtesting results. Most notably, over a 250-day test window, the addition of specific risk to the PDT VaR results in substantially fewer VaR exceptions (P&L smaller than VaR).

While these results are helpful in evaluating the role of specific risk in Morgan Stanley’s VaR methodology, some additional tests are suggested below to help us understand the performance of the APT model at a more basic level.<sup>1</sup>

## 2 Some suggested additional tests

I sketch below some additional tests which, I believe, should be easy to implement and to interpret. They will provide additional perspective on the performance of the APT model and thus build confidence in the overall VaR specific risk outputs.

### 2.1 Some definitions

For historical days  $t = 1, \dots, T$ :

1. Compute, for each firm  $i$  in the sample, model-predicted return

$$\hat{r}_{it}^{\text{mod}} = \sum_k \beta_{ik} f_{kt} + \epsilon_{it} = \hat{r}_{it}^{\text{sys}} + \epsilon_{it}$$

where  $\epsilon_{it} \sim \mathcal{N}(0, \sigma_i^2)$

2. Compute prediction errors relative to observed returns,  $r_{it}^{\text{obs}}$ ,

$$u_{it} = r_{it}^{\text{obs}} - r_{it}^{\text{mod}}$$
$$v_{it} = r_{it}^{\text{obs}} - \hat{r}_{it}^{\text{sys}}$$

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<sup>1</sup>As is well known, traditional VaR backtests (based on the number of exceptions) are subject to well-recognized weaknesses—e.g., low statistical power. More to the point, just adding a (negative) *constant* (unrelated to changes in portfolio composition, to changes in risk factors, etc.) to the VaR-exSpecificRisk would also reduce the number of exceptions.

I.e.,  $v_{it}$  is the “observed” residual, assuming that the factor model is the exact description of reality.

## 2.2 Testing model misspecification: univariate distributional assumptions

Real-world single-stock equity returns (both conditional and unconditional) often exhibit non-normality in the form of fat tails, skewness, etc. The following basic diagnostics will indicate the closeness or divergence between observed and model-predicted distributions.

1. For each firm  $i$ , compute summary parametric statistics and tail percentiles of the observed and model-predicted returns over the sample period. Consider matched ratios or differences for each statistic and percentile: e.g.,  $r_{i,Q95}^{\text{obs}}/\hat{r}_{i,Q95}^{\text{mod}}$ —if the median value of this ratio across the sample of firms is substantially greater than unity, that would suggest possible discrepancy between the model and reality.
2. Again, one can consider the parametric and non-parametric properties of  $v_{it}$ ,  $t = 1, \dots, T$  against  $\mathcal{N}(0, \sigma_i^2)$ ; if, across the sample of firms, there is substantial divergence, one may suspect that the model is misspecified.

## 2.3 Testing model misspecification: “multivariate” properties

Of more interest perhaps is the possibility of model misspecifications that result in “large” cross-sectionally “correlated” (at points in time—e.g., on a certain days) prediction errors (observed vs. predicted). Such misspecifications are more liable to manifestly mismeasure portfolio risks. The following tests seem like simple ways to uncover such behaviors, if they are present.<sup>2</sup>

### Test 1

1. Identify days, over the historical sample period, of large absolute moves (e.g., in-sample outcomes smaller than 5th percentile or greater than the 95th percentile) in one or more major equity indices. (Subsequent analyses clearly should be done separately for the two subsamples.)

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<sup>2</sup>The informal motivations for these types of outcomes (and hence for these tests) are two different possible types of misspecifications. First, the relationships embodied in the factor model could be different under extreme factor moves (loosely speaking, the coefficients could be different). Second, there could be an omitted common jump factor.



2. For the subsample of such days, consider pairwise (i.e. between firms  $i$  and  $j$ ) correlations between: (i) observed returns— $r_i^{\text{obs}}$  and  $r_j^{\text{obs}}$ —denote this by  $\rho_{ij}^{\text{obs}}$ ; (ii) predicted returns— $\hat{r}_i^{\text{mod}}$  and  $\hat{r}_j^{\text{mod}}$ —denote this by  $\rho_{ij}^{\text{mod}}$ ; (iii) prediction errors— $u_i$  with  $u_j$ ,  $v_i$  with  $v_j$ —denote these  $\rho_{ij}^u$  and  $\rho_{ij}^v$  respectively.
3. The cross-sectional statistics of the difference (or ratio) of  $\rho_{ij}^{\text{obs}}$  versus  $\rho_{ij}^{\text{mod}}$  may help in identifying model misspecification—e.g., if  $\rho_{ij}^{\text{obs}}$  is systematically greater than  $\rho_{ij}^{\text{mod}}$ .
4. Substantial non-zero values of  $\rho_{ij}^u$  and  $\rho_{ij}^v$  may also alert one to model deficiencies.

### Test 2: Hypothetical portfolios

For a hypothetical portfolio, whose composition remains fixed through the sample period, compute the distribution of daily returns over the sample period, using: (i) observed returns; (ii) predicted returns. Comparing sample statistics, especially tail quantiles, may highlight potential deficiencies in the model. This can be done for many different types of hypothetical portfolios—concentrated, etc. The difficulty, of course, lies in constructing portfolios that are reasonably representative of actual bank portfolios.

### Portfolios with concentrations

For desks that intermittently take on large concentrated positions (e.g. block trading, Risk Arbitrage), it would be helpful to analyze the interplay between such position-taking and VaR (at desk and higher levels). Specifically, on days of large position changes, it may be helpful to see the drivers of the associated change in VaR—e.g., the VaR impact if just the systematic risk [zero residuals] were considered versus systematic plus residual risks

### Other

Conversely, it may also be helpful to examine the days flagged as having “large” specific risk; what were the “drivers”—positions, APT factor values, residual draws?

## **3 Other issues to consider**

1. The factor models are estimated on weekly data but the parameters are applied to daily data for HistSim VaR purposes. Empirically, returns volatilities and correlations appear to

differ substantially by holding period, and do not always scale neatly (e.g, by  $\sqrt{t}$ ).

- Daily returns could be more volatile—e.g., because of noise, overreaction, etc. They might also be less volatile, especially for lightly-traded stocks, but coupled with jumps.
- Inter-firm correlations and systematic variance ( $R^2$ ) are likely to be greater over weekly horizons, relative to daily horizons.

It may be helpful to assess the prevalence and importance of such effects.

2. For certain firms, the historical relationships may be inapplicable. Such regime shifts may be long-term, e.g., because of fundamental changes in operations (acquisitions, regulatory changes, etc) or capital structure. Or , they may be temporary—e.g., firms “in play”. Any thoughts on how to flag such situations and deal with them—e.g., manual override to use subjective, rather than historical parameters?
3. Does Morgan Stanley retain the history (i.e, each snaphsot) of the vendor-provided information? This would be helpful in tracking the effects of the vendor’s updating of estimates and model-changes. E.g., to examine the time-stability of coefficients, factor properties, etc.

**From:** P.C. Venkatesh

**Subject:** Overview of Morgan Stanley's VaR methodology

**Date:** March 24, 2005

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## 1 Introduction and Executive Summary

As part of the CSE review ( 2005 Q1), staff of OPSRA undertook to familiarize themselves with Morgan Stanley's (hereafter, MS) VaR and related methodologies, as well their application and uses at the bank. This document summarizes the state of our knowledge with respect to the VaR methodology, offers a preliminary assessment, and identifies candidate areas for future dialogue with the bank.

This description is based on several documents provided by the bank, supplemented by conversations with bank personnel. Part I provides a general summary and non-technical overview of the methodology, introducing bank terminology and so on. To provide context, it also touches on the applications and uses of VaR in the bank—these topics are covered in greater detail in other writeups. Sections to be added to part I: applications and uses (limits); bank's slated enhancements; candidate areas for future review; brief comments on related measurements (stress and scenario); Backtesting—methodological aspects; specific risk (regulatory focus, TomD's presentation; backtest);

Part II provides further technical details of the implementation.

### 1.1 Preliminary assessment—summary

1. Overall, the basic framework and implementation of the VaR system at MS are well within the range of practices and techniques employed by major financial institutions.
2. Inherent in any VaR implementation for a large portfolio are numerous approximations, "shortcuts", etc. which may affect the quality of risk measurement. Elsewhere in this document, we have tentatively identified several candidate areas for further internal analyses by the bank.

3. The bank has self-identified several planned “VaR enhancements”, tagged with various degrees of prioritization.

4. Staff should engage in further dialogue with the bank on these issues at a later date.

## Part I

# Overview

## 2 VaR methodology—a non-technical summary

Morgan Stanley’s VaR methodology is centered on the Historical Simulation approach, but is supplemented by Monte Carlo simulation techniques.<sup>1</sup> The basic purpose of a VaR system is to produce a forecast (probability) distribution of possible portfolio values (or changes thereof)  $k$ -days (e.g.,  $k = 1$ ) ahead. Typically, this is accomplished in three generic steps<sup>2</sup>: (i) scenario generation<sup>3</sup>—generating the distribution of possible *joint* outcomes of the underliers or risk factors that instrument/position values (or changes thereof) depend on; (ii) revaluation—revaluating each instrument/position in the portfolio at each simulated scenario/joint outcome; and (iii) value or P&L distribution—for each scenario, summing up all the instruments’ values (changes) yields the portfolio value/change for that scenario; sorting the portfolio/value changes yields the P&L forecast distribution, from which target quantiles can be selected.

### 2.1 Scenario generation

The central component is a database for the Historical Simulation. This database consists of four years of daily observations on numerous rates, prices, etc—**benchmarks**, in MS parlance.<sup>4</sup> Some

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<sup>1</sup>We were told the design and initial build predates any of the current MRD staff. There were no indications of “black box risk”—however, we will enquire further in the future. There are some elements which Tom Daula, head of MRD, wishes to phase out.

<sup>2</sup>True for Historical Simulation and Monte Carlo Simulation, but not for the Variance-Covariance method.

<sup>3</sup>Not to be confused with MS-MRD’s use of this term to refer to a predefined set of joint outcomes for the risk factors.

<sup>4</sup>More discussion of benchmarks and the database is provided in later sections. At this point, it is worth noting that considerable amount of pre-processing is required in compiling a database suitable for feed to the VaR

underliers are directly present as benchmarks in this database—e.g., FX rates, swap rates, and so on. Other underliers, however, have to be constructed from some of the core benchmarks—a point we return to later. The bank refers to the step of associating an underlier with a particular set of one or more benchmarks as **benchmark mapping**.

Monte Carlo simulation is used to augment (in a manner described later) the core benchmarks. It is used primarily (but not exclusively) for generating random draws of name-specific fluctuations—e.g., in prices of individual equities and corporate bonds. Thus, for example, the simulated price-change of a stock in a scenario would be the sum of the price-change due to the “systematic” factor(s) (present in the core benchmark database) and the name-specific random draw.

In sum, scenario generation is a vital step to obtaining sensible and reasonable VaR metrics, and should be re-examined in future reviews. It is a process almost exclusively owned and operated by MRD, apart possibly from systems/IT support.

## 2.2 Revaluation

As a general rule, instruments/positions/trades are not subject to “full” revaluation. Instead, approximate revaluation schemes, based on “risk sensitivities” are used.<sup>5</sup> The risk sensitivities are computed by Front Office systems and supplied to the MRD VaR system. Two broad types of risk sensitivities are employed. The first are analogs of analytic partial derivatives—namely “Greeks”, PV01’s, and the like. Being “local” risk measures, these should perform quite well for “near-linear” instruments, and may be acceptable for options that are “monotonic”. The second are what MS calls “slides” — a table of instrument values, obtained by applying full revaluation, 

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calculator—e.g., some series need to be “backfilled” to get a 4-year history. Substantial resources are being devoted to maintenance and improvement of this database, with Dan Rodriguez as project manager.

<sup>5</sup>A simple example is how a straight bond might be revalued. Under “full” revaluation, each individual cash flow of the bond would be repriced (discounted) at the appropriate simulated rate—and this has to be done for each simulation scenario. Under approximate revaluation, first, the bond’s PV01 is calculated—this is the change in the bond’s value if the current yield curve underwent a parallel upward shift of 1bp. (This is one, and not the only, way of calculating PV01. It is obviously very closely related to the *duration* measure.) Then, for all simulation scenarios, the bond’s change in value is approximated as the PV01 times the simulated change in the yield—considerably fewer calculations than full repricing. For option-like instruments, the so-called Greeks are used for this purpose. More on all of this later.

at selected values of an underlier. Inter- and extra-polation are then used to estimate instrument values at other values of that underlier. The grid size and spacing (points of full revaluation) are different by asset class (FX, equities, etc.)

At present, only “univariate” measures (for both types of risk-sensitivities) are supplied to MRD. In general, for an instrument dependent on multiple underliers, the risk-sensitivity with respect to one underlier is a function of (i.e. varies with) the levels of the other underliers—the cross-partials are, in general, not zero. MS’s current approach does not account for non-zero cross-partials.

### 2.3 Aggregation, P&L distribution and VaR

For each simulated scenario, portfolio gain or loss is obtained just summing up each position’s gain or loss. Sorting the portfolio P&L across all simulated scenarios yields the forecast P&L distribution for the portfolio; target quantiles, such as the 1st or 99th percentiles, are easily extracted. Corresponding to such a target quantile, it is also easy to recover the associated scenario—i.e., the set of benchmark values (joint outcomes) giving rise to that portfolio gain or loss—thus, a VaR scenario may be characterized in intuitive terms, e.g., as one associated with “steep dollar appreciation, rising Treasury rates, ...”. Obviously, it is also easy to track each instrument’s contribution to the portfolio gain/loss at that scenario. That is, at a scenario giving rise to a large portfolio loss, one can easily identify the relative contributions of each position to that loss—which positions contribute the most, the least, and so on. This can be very helpful in assessing risk-reward ratios, for developing risk-reducing recommendations, and so on. The mean of this portfolio P&L distribution can be computed; MS works with a mean-adjusted P&L by subtracting the mean P&L from each scenario’s P&L.<sup>6</sup>

MS’s basic VaR calculation is standard, following the sequence and steps above. But a further variation is added. The above steps yield a VaR from a single run. Like other more familiar statistical estimates from a sample, e.g., sample mean and standard deviation, the VaR

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<sup>6</sup>Regulators have required that the mean be subtracted, mostly to remove flows perceived to be “non-trading” (commissions, fees, etc.). If the mean is positive (negative), subtraction increases (decreases) the (absolute) VaR. While the mean is *expected* to be positive in a business-setting, in a simulation, it could well be negative. For overnight horizons, the impact (from trading flows alone) is thought to be minimal.

is also an estimate; the estimated numerical value of VaR would have been different had the sample history been different. This is the principle underlying MS's variation. Specifically, additional runs are created by presenting alternate possible samples/histories to the rest of the VaR calculator. Recall that each scenario consists of a draw of the core benchmarks (loosely speaking, one historically observed joint outcome of the benchmarks/underliers), coupled with a specific-risk set, consisting of one random draw for each specific-risk factor. Using a different specific-risk set (i.e., a different set of random draws for each specific-risk factor) generates a new scenario. Doing so for all historical scenarios in the benchmark database, and repeating the others (reevaluation, aggregation) yields a new VaR run. MS carries out one hundred such repetitions, producing 100 VaR estimates. The mean of these 100 VaR estimates is computed, and the VaR run that is numerically closest to the mean is identified as the *golden run*; that is, the scenario associated with the "mean VaR" is (approximately) identified.

These golden runs are identified at divisional levels: IED, FID, and Commodities (although Commodities is now part of FID??). Subportfolios (each desk) are measured against this divisional golden-run scenario. In particular, two types of what-if analyses are run with the golden-run scenario as the foundation. The first is the *incremental* VaR, in which an entire desk is removed from the divisional level aggregate—thus, it attempts to answer the question: How much would the division's VaR change if a certain desk were eliminated?<sup>7</sup> The second is the *marginal* VaR, which measures a desk's contribution to division VaR—more precisely, the desk's P&L at the division's VaR-scenario.<sup>8</sup>

A *standalone* VaR is also computed for each desk. These appear to be computed by effectively identifying a golden-run scenario from 100 *desk-level* VaRs, but which is called *all-runs VaRs*, and reporting that VaR.<sup>9</sup>

How these measures are actually used is covered in other sections/memos.

The bank is considering dispensing with this approach of carrying out 100 separate runs, and instead consolidating the 100 different VaR runs into a single run (which would then have 100 times as many scenarios a single run currently does). The current approach is potentially

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<sup>7</sup>?? While is a tempting interpretation, the problem is that if the desk were not present to begin with, the golden-run scenario for the division could itself be different.

<sup>8</sup>I'm not completely confident that my interpretation is correct.

<sup>9</sup>The document indicates that standalone VaRs obtained from division-level golden runs can be "inaccurate."

useful for investigating the sampling variability of VaR, but this is usually of minor interest to practitioners.

### 3 VaR application and uses

Both the *level* of VaR at a point in time, and the *changes* in VaR over various horizons (daily, weekly, etc.) are of interest. Indeed, some are of the view that the latter metrics are “more reliable.” That is, although the VaR methodology may fail to properly/accurately measure the *level, or quantity* of risk at a point in time (for reasons we have already alluded to), changes in VaR may do a better job of tracking genuine changes in the riskiness of the portfolio.<sup>10</sup>

Interest centers not only on the level of risk at a point in time, but also changes in that risk, over various horizons (daily, weekly, etc.) Indeed, it is often believed that the latter types of metrics are “more reliable.” That is, while the error in VaR as a measure of the *level, or quantity* of risk at a point in time (for reasons we have already alluded to) may be substantial, changes in VaR may do a better job of tracking genuine changes in the riskiness of the portfolio.<sup>11</sup>

At MS, both VaR levels and changes are utilized and analyzed, in different manners and to different degrees across the organization. The following describes the formal uses of VaR, plus our impressions of actual usage.

FILL IN YOUR THOUGHTS, e.g.:

- VaR-based risk reports distributed to Senior Management: Independent Risk Office and Management; to Business Heads (Pandit, Cruz, Havens,...); how do they use it; what elements do they use most, etc.
- VaR-based risk reports distributed to BU managers, desk heads, BU Risk Management, etc: how do they use it

Note that the “official” VaR numbers are not at all delivered in real-time, so its use as a real-time management tool is nil. So for desks/subportfolios with rapid, intraday changes in positions, the official VaR may be quite irrelevant. Only for desks with somewhat persistent positions is the day-old VaR measure likely to be of any use.

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<sup>10</sup>In my view, a debatable point, but outside the scope of this document.

<sup>11</sup>A debatable point, but outside the scope of this document.



### 3.1 Limits

A discussion of the formal VaR and Scenario Analysis can be found in the MRD document “Risk Management Framework: Policies and Procedures” dated January 2004 (??) (pages 20-22). It indicates the formal organizational and procedural aspects of limits—how and by whom they are set; responsibilities for monitoring and reporting excessions, and so on. In the course of our (short) conversations with Business Unit personnel, we have also gained some feel for the informal role of these limits ....fill in stuff here.

### 3.2 VaR uses

The various constituents that look at VaR and use it in one way or another. Comment on relative importance attached to it by each.

## 4 Assessing the quality of a VaR risk measurement system

There are three broad dimensions along which the output quality of an *aggregate/portfolio-wide* risk measurement system, such as VaR can be evaluated: (i) integrity/quality of input position data; (ii) quality of scenario generation; and (iii) quality of revaluations. These are also the sources by which “inaccuracies/errors” can creep into a VaR system. I sketch what I believe we know about these three aspects re: MS’s VaR system.

### 4.1 Position data

- *Questions:*<sup>12</sup>

Which businesses are included in the VaR system? <sup>13</sup> If some businesses are not yet in VaR, but “should be”, reasons for exclusion (e.g., lack of: position capture; benchmarks;

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<sup>12</sup>Just a series of questions I found helpful in organizing my won thinking about the possible sources of error. Mostly, we would rely upon the bank to self-identify and report these types of problems—i.e., not something our unit would actively investigate.

<sup>13</sup>Listing zzz in “initial submission” indicates which businesses are, and are not, included in MS’s VaR system. Senior Lending is not (perhaps because it is accorded banking book treatment? However, as per Jim G., FID Treasury seems to do a fair amount of “loan portfolio management” hedges (single-name CDS) for this group; which would seem to be subjected to MTM...

risk-sensitivities)? Are any of these what Basel/CSE would expect to be in VaR (for capital calculations)?

- Of the included businesses, are any position/trade types systematically not flowing to the VaR calculator? Why not?
- Of the trades flowing through, are sufficient trade details available to “map” the trades’ underliers to the MRD benchmark database?
- Of the trades flowing through, are sufficient trade details available to revalue the trades?<sup>14</sup>

The three-way reconciliation process has been presented to us a principal means of ensuring the quality of position data capture and hence flow-through to downstream systems.<sup>15</sup> Additionally, MRD has self-identified some cases which could be described as a position-capture problem (under “VaR enhancements”).

*At this point, I don’t think we have any serious concerns about position data capture for VaR purposes. But we can re-think our involvement later.*

## 4.2 Quality of scenario generation

This can be broken down along the following lines.

- Are all relevant risk-factors being considered? In MS’s case, is the set of benchmarks “large enough”? Are material “basis risks” being introduced via the mapping process?
- Are the stochastic properties of the risk factors (univariate and multivariate) being properly represented? In MS’s case, being (mostly) non-parametric Historical Simulation, this cannot be evaluated in terms of distributional fits, parameter estimates and so on. In effect, MS’s approach declares that the 4-year history is sufficient to get an “accurate” representation

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<sup>14</sup>Trade details will be relevant if a non-FO group (e.g., MRD) seeks to apply “full revaluation”—as MRD does for their scenario analyses. However, since MS’s VaR revaluations are generally approximate (based on risk-sensitivities) this is not an issue for VaR ( I think).

<sup>15</sup>However, during today’s PE meeting, it was made very clear that controllers actively and scrupulously check a few trade-related fields—e.g., the mark, notional; but there are literally dozens of trade details, such as stike prices, exercise dates, etc. which are not scrutinized.

of the future.<sup>16</sup> Large changes in the behavior of one or more underliers (“regime shifts”, in economist-speak) could undermine this assumption. Moreover, the approach is sensitive to the sample history used—e.g., with a fixed history-window, roll-off of volatile episodes can noticeably affect measured VaR.

### 4.3 Quality of revaluations

- It is common in VaR methodologies to use “approximate” re-valuation formulas and this is a basic source of potential mismeasurement of VaR.
- Certain types of inherent assumptions in the pricing model are another potential source of mismeasurement—e.g., the assumption of a static correlation in the pricing of CDOs.

## Part II

# Details

## 5 Benchmarks

As noted earlier, many underliers are not simulated directly, but reconstructed from simulated values of so-called benchmarks. This section provides: (i) an overall description of the benchmarks used at MS (by asset class); (ii) the numerous practical challenges and difficulties in constructing and maintaining a benchmark database.<sup>17</sup>

### 5.1 Some preliminaries

In the benchmark database, it is the *levels* values of the benchmarks that are stored.<sup>18</sup> However, VaR calculations are concerned with changes in the values of instruments (and, eventually, portfolio P&L) which in turn depend on the changes in the values of the underliers. Therefore it is changes in the benchmarks that have to be simulated.

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<sup>16</sup>With qualifications, of course, for partial series and benchmarks simulated by Monte Carlo methods.

<sup>17</sup>This section draws upon several MRD documents, presentations and conversations with bank personnel.

<sup>18</sup>I do not know this for a fact, but it offers the greatest flexibility, and seems likely, since other alternatives (e.g., storing just one type of difference) render other forms irreproducible for no gain in data storage.

MS uses two types of changes, arithmetic and proportional (percentage) changes. It is helpful to introduce some notation to be more precise. Denote the historical sample values of a benchmark on days  $t$  and  $t - 1$  as  $x_t$  and  $x_{t-1}$ , the current/today's EOD value of the benchmark as  $x^*$ , the simulation draw as  $\epsilon^{\text{sim}}$  and the forecast/simulated value as  $\hat{x}$ . The following illustrates how the necessary change in benchmark/underlier is supplied to the revaluation formula.

Arithmetic difference

$$\begin{aligned}\epsilon_{\text{diff}}^{\text{sim}} &= x_t - x_{t-1} \\ \rightarrow \hat{x} &= x^* + \epsilon_{\text{diff}}^{\text{sim}}\end{aligned}$$

Scaled percentage change

$$\begin{aligned}\epsilon_{\text{pct}}^{\text{sim}} &= \frac{x_t - x_{t-1}}{x_{t-1}} \\ \rightarrow \hat{x} &= x^* + \epsilon_{\text{pct}}^{\text{sim}} \times x^*\end{aligned}$$

So named, because the percentage change  $\epsilon_{\text{pct}}^{\text{sim}}$  is “scaled” by the mark,  $x^*$ .

The observed statistical behavior of the benchmark should determine whether an arithmetic or percentage type of change is used. Arithmetic differences are appropriate if the magnitude of change tends to be independent of the level—i.e., across all  $t$ 's, the size of  $x_t - x_{t-1}$  is not systematically related to  $x_{t-1}$ . In that case, the arithmetic differences are said to be “stationary.” MS applies this, for instance, to high-rated corporate bond spreads and to oil-liquids spreads. Percentage differences are appropriate if the absolute size of the change tends to be greater for larger values of  $x_t$ . Then, percentage differences are said to be stationary. MS applies this, for example, to low-rated corporate bond spreads and to government yields.<sup>19</sup>

Unscaled percentage change

In the above cases, the simulated *level* of the benchmark is recovered and supplied to the revaluation formula. In some cases, the risk-measures fed to the VaR calculator are in the form of elasticities or proportional values (i.e., in the form  $\delta = \frac{\Delta V/V}{\Delta S/S}$ , where  $V$  is the instrument value and  $S$  is the underlier), in which case  $\epsilon_{\text{pct}}^{\text{sim}}$  is used directly—i.e.,  $(\Delta V/V)^{\text{sim}} = \delta \times \epsilon_{\text{pct}}^{\text{sim}}$ . This is said to be the convention for equity and FX deltas.

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<sup>19</sup>MRD does not have a formal program for studying the statistical properties of the benchmarks. However, during benchmarking updating (“turnover”) or as special occasions arise (“regime shift” in the market for California electricity prices), analyses appear to be carried out. An item we may wish to follow up later.

Thus, it is important to check that the benchmark moves/changes are numerically compatible with the FO risk-sensitivity measures.

### Specific risk factors

Many of the name- and security-specific factors that MS seeks to incorporate do not have benchmark time-series. A Monte Carlo simulation is used to generate draws of such factors, as detailed later.

### Internal and synthetic benchmarks

Internal series, maintained by the trading desks, are an important source of benchmarks (5116 by count)—they occur principally in Equities and Commodities. Synthetic series are constructed by MRD as proxies, in various situations, e.g.: (i) external quotes are not unavailable—e.g., FX cross-rate volatility series; (ii) weekly series have to be transformed to daily series; (iii) when synchronous data are not available. A particularly interesting example of the last is MS’s treatment of USD Government benchmarks. It was observed that the swap spread (swap rate minus USD Government) was abnormally large; this was traced to non-synchronous quotes on the swap rate and the USD Governments.<sup>20</sup> MS chose to treat the swap rate as the primitive, obtained quotes on swap spreads (a traded and quoted item for USD, Euro and pound sterling), and thus constructed a synthetic USD Government series, synchronous with swap rates.

On a related note, MRD’s benchmark series typically represent closing prices at the time of a local market close. This is consistent with the P&L calculation which is also based on local closes. It is important for VaR backtest analyses that the VaR and the P&L series be compatible. However, an undesirable side-effect is that MRD series would give the impression that the earlier-closing markets lag those closing later; put differently, the series would tend to understate the actual “covariance” across these markets, when both are open.<sup>21</sup>

### More nomenclature: price-based, yield-based, . . .

Some additional recurring nomenclature include the following. *Price-based* benchmarks seem to refer to variables like spot and futures prices. They typically do not have a term-structure

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<sup>20</sup>The problem was detected during a “VaR explain/diagnostic” exercise.

<sup>21</sup>E.g., there could be some implications in aggregating exposures across time-zones, since the “effective correlation” would tend to be higher than MS’s approach assumes.

component. Examples include FX rates, equities prices, distressed and high-yield debt.<sup>22</sup> *Yield-based* benchmarks are associated whose valuation/quoting convention is based on yields. They will typically have a term-structure component. The associated risk-sensitivities are usually PV01, spread PV01 etc. *Volatility-based* benchmarks refer to implied volatilities. They may include a term structure component.

## 6 Benchmarks: overview by asset class

### 6.1 Equities

#### 6.1.1 The equity returns factor model

The conceptual aspects of representing equity returns in terms of factor models is well-understood, dating back to finance-theoretic developments such as the CAPM and the Arbitrage Pricing Theory, and well-established statistical methods of Factor Analysis and Principal Component Analysis. The practical aspects can be tedious and time-consuming. Many services sell the relevant “data” in a ready-to-use form; MS uses a firm called Advanced Portfolio Technologies (APT).<sup>23</sup> Under their methodology, each firm’s return is presumed to be driven by 20 “common/systematic” factors and a firm-specific/residual/idiosyncratic component. The factors are not pre-specified (e.g., indices such as the S&P500) but endogenously derived from within the “universe” of equity returns—this lack of easy association with identifiable aggregates can be a marketing disadvantage. For MS’s Historical Simulation, the vendor provides a daily historical time-series of the 20 factors, each equity’s factor loadings, and the volatility of the firm-specific residual. An equity’s simulated equity return due to systematic factors is obtained by taking a draw from history of the 20 factors and multiplying that by the factor loadings. The “total” simulated return is obtained by adding a Monte Carlo draw from the Normal distribution with mean zero and the equity’s

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<sup>22</sup>Distressed and high-yield debt are often said to trade on a price- rather than yield- basis. I.e., the prices of higher-credit quality bonds are thought to be determined by investors comparing the relative yields across bonds. Not so for distressed and high-yield debt, for which sudden events can cause price-changes seldom seen for safer bonds.

<sup>23</sup>Although a switch to the internal provider, MSCI-BARRA, is likely. The latter’s decompositions were described as being more intuitive. Though the point is a fairly simple one, it is difficult to explain without resort to somewhat involved statistics.

residual volatility.<sup>24</sup>

### Mapping

RIC, CUSIP or SEDOL are used, in that order. If an equity is not found in the APT database, the country-index and then the U.S. index are used as fallback options.<sup>25</sup>

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<sup>24</sup>There are several items we could follow up on, e.g.:

- Coverage by names
- Median & Range of : total and systematic variance—a good metric of the model fit; helps in gauging the nature of inter-firm correlations predicted by the factor model.
- The benchmark doc suggests that the factor models are estimated on weekly, rather than daily returns. Empirically, returns volatilities and correlations appear to differ substantially by holding period, and do not always scale neatly (e.g, by  $\sqrt{t}$ ). How is the scaling done?
- An implicit premise of most such factor models is time-homogeneity or time-stability. This often is a faulty premise. At the extreme, for firms subject to takeovers, financial distress, etc., past stock performance will be virtually irrelevant in forecasting future behavior. (Note that the concern is not with *predicting* the onset or occurrence of such events, which are usually not a big concern for overnight VaR.) It is unclear if MRD can manually override.
- The factor model will tend to reflect inter-firm correlations during “normal” (aggregate) market moves. Actual inter-firm correlations may be quite different under significant moves in the aggregate market.
- Inter-firm correlations may be  $\gg$  than that predicted by the factor model; e.g., idiosyncratic risks may be correlated because of an “incomplete” factor model. Therefore, risk could be potentially misstated, especially in light of some of the trading strategies used at MS

<sup>25</sup>Definitions of these acronyms are:

**CUSIP** : A numbering system used to identify securities issued by U.S. and Canadian companies. Every stock, bond, and other security has a unique, 9-digit CUSIP number chosen according to this system. The first six digits identify the issuer (e.g., IBM); the next two identify the instrument that was issued by IBM (e.g., stock, bond); and the last digit is a check digit. The system was developed in the 1960’s by the Committee on Uniform Security Identification Procedures (CUSIP), which is part of the American Banker’s Association. Web site: <http://www.cusip.com>

**RIC**: Reuters Identification Code, used within the Reuters system to identify instruments worldwide. Contains an X character market specific code (can be the CUSIP or EPIC codes) followed by .YY where YY stand for the two digit country code. i.e IBM in UK would be IBM.UK. More information is available at <http://www.reuters.com>

**SEDOL**: Stock Exchange Daily Official List. The stock code used to identify all securities issued in the UK or Eire. This code is the basis of the ISIN code for UK securities and consists of a 7-digit number allocated by the master file service of the London Stock Exchange.

### 6.1.2 Implied volatility ( $\kappa$ )

Internal data from the IED “volatility surface” system provide the benchmark series. Only those surfaces used for end-of-day marking, which have been reviewed by controllers, are used. For each firm, ATM implied volatilities for 6 maturity points are used. About 700 firms are covered, accounting for 4200 internal benchmarks.<sup>26</sup>

#### Mapping

When no benchmarks are found in the database for an underlier, default mapping follows the same sequence as for the equity underliers.

## 6.2 Fixed Income

MRD maintains about 875 benchmarks for Fixed Income. The broad subcategories are corporate, government, swaps, ABS, agency, municipal and volatility (cap/floor and swaption volatilities). In line with the risk-sensitivity types, the benchmark types may be price-based, yield-based, and so on. Examples of yield-based benchmarks are government and swap curves.<sup>27</sup>

#### Mapping

Mapping is a somewhat involved process in Fixed Income. For non-basis risks, there is a three-step process. First, the product or security type is mapped to a “derived” product type. Next, based on the derived product type and “other information”, the mapping to the benchmark or benchmark curve is determined. Third, temporal interpolation, if required, is performed. Details and examples can be found in the source documents. For example, the value of a credit default swap has sensitivity to the swap rate (i.e., an interest rate sensitivity) as well as to the market CDS premium/spread; therefore, its IR PV01 is mapped to SWAP and its spread PV01 to CORP. Benchmarks with a term-structure component may come in one of two forms: (i) buckets, or (ii) specific maturity/tenor points. If the benchmark is of the latter form, and the risk-exposure does not identically match the tenor/term, interpolation is performed on the simulated values of the adjacent benchmarks.<sup>28</sup>

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<sup>26</sup>There are many more underliers in the APT database; however, the number of equities that have options is fewer.

<sup>27</sup>Do spreads come in with term structure? e.g., Rating+tenor matrices for corp. bond systematic risk

<sup>28</sup>May want to follow up on this a bit.



Basis risks are designated as “ir basis” or “fx basis” and combined with curve and currency information to arrive at appropriate mapping. ABS yields are synthetically constructed by adding a spread to a swap rate.<sup>29</sup>

Specific risk is simulated via draws from a (non-central)  $t$ -distribution (i.e., Monte Carlo).<sup>30</sup>  
<sup>31</sup> “At present, it is applied only to corporate-like positions for which spread benchmarks are available.” (??) Specific risk is not applied to slide-based measures of spread risk (why not??). The same specific risk draw is applied to all positions for a given issuer.<sup>32</sup>

### 6.3 FX

There are 49 price-based benchmarks and 9 volatility-based benchmarks for key currency pairs.<sup>33</sup> Similar to Equities, Delta exposures are mapped to price-based benchmarks and kappa exposures are mapped to volatility-based benchmarks.<sup>34</sup> Interest rate exposures arising in the FX desk are mapped as in Fixed Income.

Cross-currency implied volatility series are either sourced externally or else synthesized in one of two ways. Under the first method, a correlated series is computed:

$$\sigma_{xy}^t = \sqrt{(\sigma_x^t)^2 + (\sigma_y^t)^2 + 2\rho_t\sigma_x^t\sigma_y^t}$$

where  $\sigma_{xy}^t$  is the cross-currency implied volatility for date  $t$ ;  $\sigma_x^t$  and  $\sigma_y^t$  are the implied volatilities

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<sup>29</sup>Other noteworthy items: (i) There are 232 Government bond benchmarks; (ii) There are 140 ABS-type benchmarks in USD, EUR, GBP or JPY; (iii) All GSE debt maps to FNMA; (iv) Corporate bonds held by the Emerging Markets Desk (which would normally map to CORP) instead have two independent, separate derived product types: EMKT (if mapped to a price-based series) and YEMKT (if mapped to a yield-based series). “This special treatment was needed to distinguish global bonds from local bonds issued in emerging markets.” (?? So which maps to which)

<sup>30</sup>Specific risk is calculated for positions whose spread risk is mapped to corporate bond spreads. As noted in the section on revaluations, the approach to revaluations is slightly different for these cases and its interaction with the treatment of specific risk results in some inconsistencies.

<sup>31</sup>At a later date, we should probably look into the estimation of these parameters. It appears they are based on arithmetic differences.

<sup>32</sup>True only for fixed-income positions. It is independent of the equity specific risk draw for the same issuer.

<sup>33</sup>Not clear whether cross-rates (for non-USD but “major” ccy) have benchmarks or are just inferred by triangulation. Likewise, not clear if there’s any term structure to the volatility benchmark(s). See the note elsewhere concerning simulation of FX implied vols. Perhaps a follow-up item.

<sup>34</sup>No forward rates seem to appear. So presumably, covered IRP is invoked to simulate forward curves.

for currencies  $x$  and  $y$  (against USD) at date  $t$ ; and  $\rho_t$  is the correlation between the implied volatilities, approximated as the the trailing 60-day correlation between the corresponding exchange rate proportional changes.

Under the second method, the series is generated via draws from a Normal distribution with zero mean and typical standard deviation of 0.55.<sup>35</sup>

## 6.4 Commodities

MRD currently maintains 1067 benchmarks for the Commodities group, of which 936 are energy-related, and the remaining are chiefly freight or metals-related. Futures and spot price changes/returns are modelled via price-based constant maturity futures contracts (supplied by internal sources). Volatility benchmarks are simulated, due to lack of data.<sup>36</sup>

### Mapping

Commodities mapping is said to be similar to Fixed Income in some respects:

- Forward curves require temporal interpolation across the term structure.
- Percentage change vectors are scaled using current marks (ie. indicating that FO risk exposures are being fed in the form  $\Delta V/\Delta S$ , not as elasticities.
- Basis risks are numerous and have to be captured.

E.g., there are 250 NatGas benchmarks for 10 different locations. Given that trading also occurs the usual lines, closely allied spread contracts need to have benchmarks at similar term structure points. Because of the large number of locations for electricity exposures, roughly half of the 936 energy benchmarks are electricity-related.

## 7 Benchmarks—meeting notes

The idea is to weave these points into larger themes in the other subsections on Benchmarks.

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<sup>35</sup>Unclear the extent to which the two methods are used.

<sup>36</sup>Should follow up on both items.

## 7.1 March 8: Dan leading

✳ Revaluations proceed by pairing an FO risk-sensitivity measure with a simulated underlier, which in many cases is itself a benchmark. It is, therefore, critical that the risk-sensitivity and the benchmark be compatible/consistent in all respects. As noted in section 5.1, a simple example is that of measurement units—a risk-sensitivity measure, such as PV01, may be supplied as an elasticity,  $\delta = \frac{\Delta V/V}{\Delta S/S}$ , or as  $\frac{\Delta V}{\Delta S}$ . In the first instance, the benchmark should be supplied as an *unscaled* percentage change, but as a scaled percentage change in the second. These problems are identified and rectified via conversations with the model reviewer, with the Risk Monitor; consulting the model documentation. A Data Dictionary, incorporating data standards is being developed.

✳ Indicative VaR is used as a method of “understanding” trades; their risk-sensitivities, etc. Risk representation for wet freight; P&L volatility ??

✳ Unit testing: live trade ??

✳ Basis trades are the norm in the commodities area. Thus, to adequately reflect the trade risks in VaR, the commodities area tends to have, in some sense, many more and more finely-tuned benchmarks.

✳ constant maturity futures contracts are from LIM, XMim. There are 2 versions of XMim: 1 for procuring data for the benchmark database, and another for retrieving MS benchmarks for “research” purposes. E.g., Louis has downloaded swaption volatilities.

✳ MS follows a quarterly schedule for database maintenance and updating. The CSE rule requires monthly??

✳ E.g., of time-instability: Peak vs Off-peak spread series has now become much more volatile because of changes in the relative prices of alternative fuel inputs for electricity generation [engineering changes too (?) ]

✳ Trades are built to exploit perceived relative advantages/discrepancies across term structures and across “related” assets. Thus, both temporal and cross-asset dependencies (loosely speaking, “correlations”) become important in VaR calculations. However, the “economics” governing these price-relationships can be quite subtle—the allowable basis fluctuation may be constrained by “natural”, arbitragable bounds in some cases, but more freely variable in others. E.g., for NatGas, some transportation, and hence arbitrage, is possible if there are other geo-

graphically close delivery points, but not otherwise. Likewise, barriers (natural and man-made) exist to confine the economical transmission of power across locations

- ✱ E.g. of regime shift: CA power series
- ✱ New locations/products
- ✱ Seasonality is a pervasive feature of many commodities

### 7.1.1 Simple benchmarks

Fill in from notebook later

## 8 Reval formulas

### 8.1 Equities

#### 8.1.1 Linear and near-linear instruments

Change in value is approximated by first-order partial derivatives:

$$\Delta V = \frac{\partial V}{\partial S} \Delta S + \frac{\partial V}{\partial \sigma} \Delta \sigma + \frac{\partial V}{\partial r} \Delta r$$

Notes:

1. Risk sensitivities are computed by FO pricing models.
2. Details of how the risk sensitivities are calculated (i.e., quasi-analytic, “bump and revalue”, etc.) are not yet known. Accordingly, error in these risk sensitivities is also not known.
3. If “bump and revalue”, amount by which underlier is bumped is not known.

### 8.2 Slides

“Full” reval is done at :  $\pm 5\%$ ,  $\pm 10\%$ ,  $\pm 20\%$ ; this is *one-dimensional*, i.e., each risk factor is perturbed separately and individually, holding the other risk variables/underliers at their initial values. Inter- and extrapolation are used to find the value changes at other points (cubic spline is used).

Notes:

1. Obviously, lacks “cross-partial” effects
2. Analysis of approximation errors?

3. Sticky skew, sticky delta, etc. —how taken into account?

## 8.3 Fixed Income

### 8.3.1 Partial

The following are noted in the doc:

$$PV01 = \frac{\partial V}{\partial r} \text{ (default-free/benchmark } \uparrow 1 \text{ bp)}$$

$$\text{Spread sensitivity} = \frac{\partial V}{\partial s} \text{ (spread } \uparrow 1 \text{ bp)}$$

$$\kappa \text{ (Kappa)} = \frac{\partial V}{\partial \sigma} \text{ (implied vol } \uparrow 10\%)$$

#### Notes:

1. All these underliers have a term-structure to them, and so the question arises: what is actually perturbed? Generally, the same perturbation is applied to all points of the term structure (“parallel” shift); but this does not resolve everything—e.g., results differ depending on whether the underlying curve is taken to be the forward curve, the par-yield curve, the zero-coupon curve, etc.

2. With implied vol, there is also the matter of moneyness patterns (smile/skew)

### 8.3.2 Price-based

Position value itself is treated as a risk measure in some cases.

### 8.3.3 Slides

Used *only* for spread risks of structured credit positions—basket default swaps and credit-sensitive indices.

“Each component of structured credit product is supplied with spread slides well as spread PV01s.”

I.e., using the bank’s notation, the following are supplied:

$$\frac{\partial V}{\partial r}, \quad \{\{\Delta s_{\ell}^k, \Delta V_{\ell}^k\}\}, \quad \frac{\partial V}{\partial s_{\ell}^k}, \quad \frac{\partial V}{\partial \sigma}$$

Slide values are computed at:  $-19\%$ ,  $\pm 10\%$ ,  $+21\%$ ,  $+100\%$ ;

PV01 and kappas for structured credit are also used, but for position as a whole.

Notes: 1. Need to clarify statements regarding structured credit calculations.

2. No slides for IR options?<sup>37</sup> For yield-based benchmarks,...see doc.

For a structured credit product, if yield-based benchmark is used, then

$$\Delta V \approx \frac{\partial V}{\partial r} \Delta r + \Delta V_{\ell}(\Delta \tilde{s}) + \frac{\partial V}{\partial \text{sigma}} \Delta \text{sigma}$$

Piecewise cubic splines used for interpolation.

BUT, if structured position is mapped to a price-benchmark, spread risk is not computed; P&L is computed using “ $\Delta$  market value” and kappa effects.

### 8.3.4 Spread risk P&L

“Corporate bonds are mapped to spreads.”

Q: To rating-level (proxy for systematic) and name-specific?

But for others (ABS, CMBS, etc.), the benchmark is yield. And “spread risk” P&L is computed by applying the spread PV01 to opposing swap positions.

Any issues/questions on this?

### 8.3.5 Specific risk

Applies for instruments (e.g., Corporate Bonds) that have a mapping to spread risk.

$$\Delta V \approx \frac{\partial V}{\partial r} \Delta r + \frac{\partial V}{\partial s} \Delta s + \frac{\partial V}{\partial \epsilon} \epsilon + \frac{\partial V}{\partial \text{sigma}} \Delta \text{sigma}$$

(Benchmark matter) For high-rated bonds: both systematic risk and spread risk are difference-based.

For low-rated bonds: systematic risk is percentage-based, but spread risk is difference-based.

Said to present an inconsistency. CHECK OUT MORE FULLY.

Notes: 1. Get more details on the estimation of the  $t$ -distribution for specific risk draws.

2. As in footnote 16 of the doc, specific risk-draws for bond and equity exposures on a given name are distinct (hence independent).

3. Specific risk is not applied to slide-based measures of spread risk. Implications?

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<sup>37</sup>Are “extreme” overnight moves in underliers are small enough that this (i.e., second-order partials) can be ignored?

## 9 FX

Doc gives product descriptions at a very coarse level—spot, futures and forwards, options (exchange and OTC).

### 9.1 Spot, futures and forwards

Risk measures used are:

$$\frac{\partial V}{\partial s}, \frac{\partial^2 V}{\partial s^2}, \frac{\partial V}{\partial r} (= 0 \text{ for spot})$$

Notes: 1. Why is  $\frac{\partial^2 V}{\partial s^2}$  used here but not, say, for equities?

### 9.2 Options

The following risk measures are supplied:

$$\frac{\partial V}{\partial r}, \{ \{ \Delta s^k, \Delta V^k \} \}, \frac{\partial V}{\partial \sigma}$$

Slide values are computed at:  $\pm 0.5\%$ ,  $\pm 1\%$ ,  $\pm 3\%$ ,  $\pm 5\%$ ,  $\pm 10\%$ ,  $+20\%$  —piecewise linear interpolation used. PV01 and kappas also used. For cross-currency options, dual slides are used (see doc).

Notes: 1. Why is a finer grid (for slides) used here? Why is piecewise linear (as opposed to cubic elsewhere) used?

## 10 Commodities

Underliers include: energy; crude oil and products; gas and electricity; metals. Product types, in very broad terms, include futures, forwards, swaps and options.

For spot positions, only delta is used. Otherwise, the following risk measures are supplied:

$$\frac{\partial V}{\partial s}, \frac{\partial^2 V}{\partial s^2}, \frac{\partial V}{\partial r}, \frac{\partial V}{\partial \sigma}$$

Oil-liquids are traded on a spread basis, and therefore benchmark moves are differences; all others are percentage changes.

### 10.0.1 Specific risk

**From:** P.C. Venkatesh

**Subject:** Suggested additional tests of the APT model

**Date:** September 23, 2005

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## 1 Background

### The APT model in brief

The APT model is a multi-factor model of equity returns. It is estimated using weekly returns of a large “universe” of traded stocks, with wide coverage across the spectrum of industries, locations, capitalizations, etc. The bank receives from the vendor the following inputs for VaR calculations: history of daily factor moves, factor loadings/coefficients for each firm covered, idiosyncratic variance.

### Tests presented by the bank

The bank presented tests to assess three major assumptions of the APT model: (i) the factors are mutually uncorrelated; (ii) the mean value of the residual is zero; and (iii) the specific risk factor is uncorrelated with all of the factors. The bank concluded that these assumptions were generally satisfied.

The bank also compared, for a sample of 100 firms over a 250-day period, the volatility of “realized residuals” (more on this definition below) against the APT-supplied volatility. The bank concluded that the volatilities were generally comparable. At the same time, the bank observed that, over the sample period, observed returns appeared to exhibit a higher volatility than APT returns. A possible explanation for this is that the APT factor-model had been estimated over some longer period of more volatile equity returns. Since the vendor does not supply the “raw” data, the bank is unable to easily re-estimate the model to test this more rigorously—a potential drawback of relying on a vendor model.

The bank also displayed some VaR-related calculations. One set consisted of the relative contribution of specific risk to total VaR.

☛ Some of these numbers require clarification. On page 14, for IED, specific risk as a proportion of *total* VaR is shown to exceed 100% on certain dates. While presumably not impossible under



a HistSim method, this still merits further explanation.

☛ For PDT, specific risk is quite routinely greater than 100% of VaR—but is this total VaR or just the VaR-exSpecificRisk; if the former, it is again counter-intuitive.

The second set consisted of backtesting results. Most notably, over a 250-day test window, the addition of specific risk to the PDT VaR results in substantially fewer VaR exceptions (P&L smaller than VaR).

While these results are helpful in evaluating the role of specific risk in the bank’s VaR methodology, some additional tests are suggested below to help us understand the performance of the APT model at a more basic level.<sup>1</sup>

## 2 Some suggested additional tests

I sketch below some additional tests which, I believe, should be easy to implement and to interpret. They will provide additional perspective on the performance of the APT model and thus build confidence in the overall VaR specific risk outputs.

### 2.1 Some definitions

For historical days  $t = 1, \dots, T$ :

1. Compute, for each firm  $i$  in the sample, model-predicted return

$$\hat{r}_{it}^{\text{mod}} = \sum_k \beta_{ik} f_{kt} + \epsilon_{it} = \hat{r}_{it}^{\text{sys}} + \epsilon_{it}$$

where  $\epsilon_{it} \sim \mathcal{N}(0, \sigma_i^2)$

2. Compute prediction errors relative to observed returns,  $r_{it}^{\text{obs}}$ ,

$$u_{it} = r_{it}^{\text{obs}} - r_{it}^{\text{mod}}$$
$$v_{it} = r_{it}^{\text{obs}} - \hat{r}_{it}^{\text{sys}}$$

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<sup>1</sup>As is well known, traditional VaR backtests (based on the number of exceptions) are subject to well-recognized weaknesses—e.g., low statistical power. More to the point, just adding a (negative) *constant* (unrelated to changes in portfolio composition, to changes in risk factors, etc.) to the VaR-exSpecificRisk would also reduce the number of exceptions.

I.e.,  $v_{it}$  is the “observed” residual, assuming that the factor model is the exact description of reality.

## 2.2 Testing model misspecification: univariate distributional assumptions

Real-world single-stock equity returns (both conditional and unconditional) often exhibit non-normality in the form of fat tails, skewness, etc. The following basic diagnostics will indicate the closeness or divergence between observed and model-predicted distributions.

1. For each firm  $i$ , compute summary parametric statistics and tail percentiles of the observed and model-predicted returns over the sample period. Consider matched ratios or differences for each statistic and percentile: e.g.,  $r_{i,Q95}^{\text{obs}}/\hat{r}_{i,Q95}^{\text{mod}}$ —if the median value of this ratio across the sample of firms is substantially greater than unity, that would suggest possible discrepancy between the model and reality.
2. Again, one can consider the parametric and non-parametric properties of  $v_{it}$ ,  $t = 1, \dots, T$  against  $\mathcal{N}(0, \sigma_i^2)$ ; if, across the sample of firms, there is substantial divergence, one may suspect that the model is misspecified.

## 2.3 Testing model misspecification: “multivariate” properties

Of more interest perhaps is the possibility of model misspecifications that result in “large” cross-sectionally “correlated” (at points in time—e.g., on a certain days) prediction errors (observed vs. predicted). Such misspecifications are more liable to manifestly mismeasure portfolio risks. The following tests seem like simple ways to uncover such behaviors, if they are present.

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### Test 1

1. Identify days, over the historical sample period, of large absolute moves (e.g., in-sample outcomes smaller than 5th percentile or greater than the 95th percentile) in one or more

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<sup>2</sup>The informal motivations for these types of outcomes (and hence for these tests) are two different possible types of misspecifications. First, the relationships embodied in the factor model could be different under extreme factor moves (loosely speaking, the coefficients could be different). Second, there could be an omitted common jump factor.

major equity indices. (Subsequent analyses clearly should be done separately for the two subsamples.)

2. For the subsample of such days, consider pairwise (i.e. between firms  $i$  and  $j$ ) correlations between: (i) observed returns— $r_i^{\text{obs}}$  and  $r_j^{\text{obs}}$ —denote this by  $\rho_{ij}^{\text{obs}}$ ; (ii) predicted returns— $\hat{r}_i^{\text{mod}}$  and  $\hat{r}_j^{\text{mod}}$ —denote this by  $\rho_{ij}^{\text{mod}}$ ; (iii) prediction errors— $u_i$  with  $u_j$ ,  $v_i$  with  $v_j$ —denote these  $\rho_{ij}^u$  and  $\rho_{ij}^v$  respectively.
3. The cross-sectional statistics of the difference (or ratio) of  $\rho_{ij}^{\text{obs}}$  versus  $\rho_{ij}^{\text{mod}}$  may help in identifying model misspecification—e.g., if  $\rho_{ij}^{\text{obs}}$  is systematically greater than  $\rho_{ij}^{\text{mod}}$ .
4. Substantial non-zero values of  $\rho_{ij}^u$  and  $\rho_{ij}^v$  may also alert one to model deficiencies.

### Test 2: Hypothetical portfolios

For a hypothetical portfolio, whose composition remains fixed through the sample period, compute the distribution of daily returns over the sample period, using: (i) observed returns; (ii) predicted returns. Comparing sample statistics, especially tail quantiles, may highlight potential deficiencies in the model. This can be done for many different types of hypothetical portfolios—concentrated, etc. The difficulty, of course, lies in constructing portfolios that are reasonably representative of actual bank portfolios.

## 3 Other issues to consider

1. The factor models are estimated on weekly data but the parameters are applied to daily data for HistSim VaR purposes. Empirically, returns volatilities and correlations appear to differ substantially by holding period, and do not always scale neatly (e.g, by  $\sqrt{t}$ ).
  - Daily returns could be more volatile—e.g., because of noise, overreaction, etc. They might also be less volatile, especially for lightly-traded stocks, but coupled with jumps.
  - Inter-firm correlations and systematic variance ( $R^2$ ) are likely to be greater over weekly horizons, relative to daily horizons.

It may be helpful to assess the prevalence and importance of such effects.

2. For certain firms, the historical relationships may be inapplicable (e.g., because of fundamental changes in operations (acquisitions, regulatory changes, etc) or capital structure). Any thoughts on how to flag such situations and deal with them?

**Subject:** Implied volatilities in VaR: a roundup

**Date:** June 18, 2006

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This note was prompted by Merrill Lynch’s proposed revamp (in response to the Irish regulator). Part I provides some general background on the genesis and characteristics of implied volatility surfaces. Part II focusses on implied vol treatments, for VaR purposes, at MLCMB and MLCO (firmwide VaR). Part III describes in brief the treatments at other firms.

The matter was prompted by the fact that Merrill Lynch’s firm-wide VaR model (hereafter, MLCO VaR) treats implied volatilities in a fairly simplistic way. The Merrill Lynch Capital Markets Bank (MLCMB) portfolio includes interest rate and currency derivatives which require more advanced VaR treatment. The firm initiated some efforts in that direction—one purpose of this note is to summarize and comment on the firm’s approach.<sup>1</sup>

## Part I

# Background on implied volatilities

## 1 Necessity of volatility surfaces

As is well known, the basic Black (& Black-Scholes) formulation is applicable if the same volatility value can be used to price all options on a given underlier. Conversely, implied volatilities, computed by applying the Black model to market prices, should be the same for all options (on the same underlier). This is generally not true in practice, probably because observed market prices reflect the net effect of numerous forces: (i) market participants’ beliefs about the future statistical properties of the underlier(s); (ii) market “imperfections”—clienteles, illiquidity, supply/demand “technical factors”, transaction costs, etc. Standard pricing models, however, assume highly idealized versions of these forces—e.g., under the basic Black formulation, everyone has the same beliefs and there are no market imperfections—leading to deviations between market prices and the prices generated by simpler models. Models that capture *systematic patterns*

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<sup>1</sup>Indications are that improved volatility treatment for other portfolios/locations is likely to be based on this approach.

in volatility have been (and continue to be) developed. However, “better-fitting” models tend to be more complex and “proprietary” (i.e., not standard across firms), making them unsuitable for active quotation. Thus, the practice is to price with the complex model, but translate that to equivalent Black prices for purposes of quotation. One *infers* the volatility that has to be input to the Black model to produce the “complex-model” price—these are the quoted Black volatilities. Invariably, the structure (by option maturity and moneyness) of “complex-model” prices, is such that the resulting quoted Black volatilities exhibit discernible patterns. These volatility patterns, with respect to maturity and moneyness, constitute the quoted volatility surfaces. These are, in turn, used as inputs to re-price the existing book, including off-market and exotic trades.

## 1.1 Volatilities of what?

It helps to be specific as to the underliers of the quoted volatilities. Recall that the prices of European options depend on the expected payoff (computed with respect to the risk-neutral distribution) at the maturity of the option (“terminal” distribution). Under the Black/Black-Scholes assumptions, the terminal distribution of the underlier is lognormal, and the expected payoff is determined entirely by the volatility of the underlier’s terminal distribution. Thus, the quoted implied volatility refers to the “lognormal” volatility of the underlier at the option’s maturity.

Systematic departures from the constant-volatility assumption occur along several dimensions. The two most important ones are with respect to the option-maturity and the option-moneyness/strike. This is the case for equities and FX. For interest rates, variation along a third dimension—the tenor of the underlying rate—may also be observed.

## 2 Typical patterns

### 2.1 Equities

Extracted from European options of different maturities and different strikes.

- Came into being only after 1987 stock market crash.
- W.r.t. moneyness, For indices, skew is typical (more pronounced on the put side) , wherein

OTM puts are more valuable (in terms of implied vol) than OTM calls. This can be interpreted in different ways: (i) a “high” demand for OTM puts (e.g., from pension funds, etc.) with relatively few natural suppliers; and/or (ii) the market assigns, relative to the Normal, a higher probability to large downside moves, but not for similar upside moves.

- For single stocks, a smile is often seen—consistent with the idea that individual stocks can experience negative or positive jumps.
- Moneyness patterns are more pronounced for shorter-maturity options, when expressed w.r.t strike. But w.r.t delta, skew is more stable w.r.t option-maturity.
- skew becomes steeper during periods of market turbulence—what does turbulence mean—change in implied vols or large absolute moves in underlier?
- Changes in ATM vol is negatively correlated with underlier level (the leverage effect)—weaker for longer maturity.
- ATM vol: in normal markets, not much temporal pattern. In excited markets, ATM vol of short-expiry options tends to rise.
- Floating vs. sticky smile.

## 2.2 Interest rates

Interest rate volatility surfaces are usually derived from caps/floors and swaptions, which are typically the most liquid interest rate options. The volatility surface is characterized along three dimensions: term or maturity of the option; tenor of the underlying rate; skew and smile—moneyness of the underlying forward rate with respect to the strike. <sup>2</sup>

### Moneyness

- Became evident in JPY circa 1994, and has since spread.

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<sup>2</sup>A caplet is an European call, of a given term/maturity, on a floating rate, of a given tenor. A cap is a series of caplets, all with a common strike. An European swaption is the option to enter into a swap, at the maturity date of the option, at a predetermined swap rate (strike).

- Is a smile in some currencies, a skew in others. Again, more pronounced on the OTM put side.

With option maturity

- Often a hump shape, initially increasing with maturity, peaking at about the 2Y point and then decreasing with maturity.

With underlier tenor

- ?

## 2.3 FX

The main volatility patterns to be captured are term structure (implied vols of the terminal spot FX rates at the option maturity dates—usually expressed as volatilities of the forwards expiring at those dates) and moneyness.

With option maturity

- Depending on the circumstances, can be increasing with maturity, decreasing with maturity (higher uncertainty in the near-term).

Moneyness

- Usually a smile (the FX rate can jump in either direction), but depending on the relative “strength” of the 2 currencies, can be more pronounced on one side.
- Market convention is to quote implied vols for the Risk Reversal and the Strangle, at different moneyness points.

## Part II

# ML Methods

## 3 Overview & Summary

Both MCLO and MLCMB use HistSim. The main difference is that: (i) MLCO allows only for a “parallel” shift of the ATM vol term structure (does not consider vol variation by moneyness); (ii)



MLCMB allows for a richer description of vol movements, including term structure deformations and moneyness variations. The objective is to estimate the incremental VaR due to the richer specification and assess regulatory capital adjustments accordingly.<sup>3</sup>

A direct approach to this estimation would be to incorporate the richer specification into the MLCO VaR and do a “with and without” analysis. Although the firm seems to have done this on a prototype basis (see section 6), it seems to prefer an indirect approach on an ongoing basis. Specifically, first, the MLCMB VaR is computed with *only* the vol-surface risk factors active—this is called the Stand-Alone Volatility Surface VaR. Second, since the MLCO VaR already includes a “parallel” shift of the ATM vol term structure, this is re-run with only the vol factors active to yield a stand-alone MLCO Volatility VaR. Third, the incremental impact of the richer specification is estimated as the difference (floored at zero) between the Vol Surface VaR and the MLCO stand-alone VaR. This is the add-on figure to which a multiplier may then be applied for capital purposes.

The following sections provide details on the individual approaches. Section 6 summarizes the performance tests carried out by the firm relating to these approaches.

## 4 MLCMB approach

### 4.1 FX

#### 4.1.1 Risk factors

##### Term structure

The *term structure* of vols is captured by ATM vols at the 3M, 6M, 1Y, 2Y, 3Y, 4Y, 5Y, 6Y, 7Y and 10Y points for all ccy pairs; for USD—JPY, 15Y and 20Y points are also included.<sup>4</sup> <sup>5</sup>

##### Skew/smile

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<sup>3</sup>A preliminary backtest of the MLCMB portfolio subjected to the MLCO VaR methodology revealed some VaR-violations, stimulating the development of the proposed methodology.

<sup>4</sup>The last is to accommodate JPY-denominated long-dated FX and interest rate exposures via, e.g., PRDC (Power Reverse Dual Currency) trades.

<sup>5</sup>The doc adds the observations that: (i) the short end (under 2Y) is actively traded (ATM only?) whereas the long end is dominated by structured trades with infrequent trading.

Risk reversal and strangle data are used to capture the moneyness patterns in vols. The patterns at the 1Y point are assumed to hold for all later maturities.<sup>6</sup>

For simulation purposes, the assumption made is that the properties of proportional (percentage) changes are stationary—i.e, the processes are “log-relative” (the same assumption applies to MLCO VaR). Hence, the simulated change and simulated level are computed as, respectively,  $\Delta x^{\text{sim}} = x(0) \times \Delta x_t^{\text{hist}}$  and  $x^{\text{sim}} = x(0) \times (1 + \Delta x_t^{\text{hist}})$ ; where  $x(0)$  is the current *level* of the risk factor,  $\Delta x_t^{\text{hist}}$  is the *proportional* change observed on day  $t$  of the historical series.

Internal, price-verified, data are the source for these series. They are updated monthly.

#### 4.1.2 Revaluation

##### Term structure

At deal level, first- and second-order sensitivities are computed, supplied by Front Office models, for each vol risk factor:  $\frac{\partial P}{\partial \sigma_i}$ ,  $\frac{\partial^2 P}{\partial \sigma_i \partial \sigma_i}$ , where  $\sigma_i$  is the ATM vol at maturity point  $i$ .

☛ *Check that, for each deal, this is done for each  $i$ ; versus mapping a deal to a single maturity point (many instruments will be sensitive to multiple points on the vol term structure)*

The approximate value change is then given by the usual formula<sup>7</sup>:

$$\Delta P = \sum_i \frac{\partial P}{\partial \sigma_i} \Delta \sigma_i + \sum_i \frac{\partial^2 P}{\partial \sigma_i \partial \sigma_i} (\Delta \sigma_i)^2 \quad (1)$$

Points worth noting:

- In general, such sensitivities are functions of the other determinants of the price—e.g., the FX rate level. This issue is particularly acute for common FX derivatives such as barrier options. That is, the sensitivities to vols will vary (possibly substantially) with the simulated values of the FX rate. The firm’s approach does not allow for this.
- In equation 1, only the linearly additive value-impacts are allowed for. Cross-partial effects within the vol term structure are ignored.

##### Skew

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<sup>6</sup>However, the doc says that, in the market, skews are distinguishable, and moderately traded, up to the 5Y point.

<sup>7</sup>The partials are computed using numerical approximations with  $\Delta \text{sigma} = 0.05\%$  (relative to current  $\sigma$ ).

The sensitivity of a deal to changes in risk-reversal is obtained by: (i) applying equal up and down shocks to the put and call vols, respectively; (ii) computing resultant vol shocks to other delta/moneyness points via linear interpolation (in variance); and (iii) revaluing the deal.

☛ Since both the 25 $\Delta$  and 10 $\Delta$  are used, how is one kept “constant” while the other is shocked—might give rise to peculiar skews?

Similarly, the sensitivities to strangles are computed by applying equal positive shocks to the put and call vols and proceeding as above.

☛ magnitudes of these shocks?

## 4.2 Interest rate derivatives

A volatility surface is constructed from five option maturities (3M, 6M, 2Y, 10Y and 20Y), four underlying tenors (6M, 2Y, 10Y and 20Y) and 3 moneyness points (25%, 50% and 75% delta). Commensurate time-series for VaR are derived from internal marks. Sensitivities of positions to these “vol points” are supplied by front-office analytics.

Market convention for moneyness is however in terms of forward rate (?) relative to the strike. This skew is defined through a calibration of market prices for relevant options into a lognormal vol cube.

### Calculation of vol exposure

Full volatility cubes (i.e., Black equivalent (lognormal) vols for a number of option expiries, rate tenors and option strikes (these are the three “dimensions” of the cube) are populated at the end of each day via trader marks. This cube is expressed in relative strike terms (forward vs. strike). The ATM strike (50 delta) is determined by comparing the strike to the forward rate implied from the current yield curve. The

## 5 MLCO (firmwide)

### 5.1 Interest rate products

The risk factor (i.e., history included in HistSim) is a single ATM vol, the maturity and tenor of which are agreed upon with the desk and changed only infrequently. A “relative” (lognormal-

type) specification is used.<sup>8</sup>

Univariate grids are used for repricing—i.e., each trade is revalued at perturbed vol levels corresponding to scenario shocks of  $\pm 10\%$  change in implied vol. Linear inter- and extrapolation are used to compute “off-grid” values.

## 5.2 FX products

See earlier discussion in 5.??

Unclear. Expect a single ATM vol of some pre-agreed maturity is used. ➡ What are the shocks applied to other maturity points—same numerical (absolute) as the benchmark, or the same *percentage* shock as the benchmark but scaled by the current level of the vol at that maturity point?

## 6 Tests & Comparisons

The firm carried out various types of tests—these are detailed in Appendix I of their Oct 2005 document. I comment on one briefly.

### Add-on approach vs. “Integrated” VaR

An “integrated” VaR, in which the extended vol surface essentially replaces the existing MLCO vol specification, was calculated by conjoining the appropriate P&L series.<sup>9</sup> The modified vol specification was done for the Complex FX Options (CFXO) business. The integrated VaR for MLCMB exceeded the production or MLCO VaR for MLCMB by 69%, on average—indicating the importance of the richer vol specification for MLCMB. Furthermore, the add-on approach was, on average, 43% higher than the integrated VaR—an argument that the add-on approach leads to conservative estimates of VaR.

The other tests considered the impact of alternative methodological features, such as the history used, the interpolation scheme used, etc. No serious issues were found.

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<sup>8</sup>For repricing, the (simulated) *level* of vol is required. For each historical day  $t$ , this is obtained by multiplying  $\{1 + \text{the (historically) observed percentage change in implied vol}\}$  by the *current level* of vol.

<sup>9</sup>Only two years of history, rather than four, is available for the extended vol surface.

## Part III

# Other firms

## 7 Interest rate products

### 7.1 Goldman Sachs

ATM cap vols for several maturities (underlier tenor not specified). ATM swaption vols for several option maturities and swap tenors. Extent of data differs by currency.

Vol-of-vols is represented as a parameter, suggesting that historical time-series are not used? For each vol factor, the daily percentage change is assumed to be Normally distributed. Do these descriptions apply only for the old VCV approach?

No details are provided on reval methods, other than a statement that “full revaluations or Greeks (delta-vega)” may be used.

☛ Notes on GS’s exponential weighting; how it leads to automatically updated vols and correlations.

### 7.2 Morgan Stanley

Risk factors include: (i) cap vols (presumably ATM, and on 3mo Libor) —2Y, 5Y and 10Y; (ii) swaption vols (presumably ATM) for a range of option maturities (0.25Y to 10Y) and underlying swap maturities (1Y to 10Y). First-order “partial sensitivities” (presumably numerical) are computed for a 10% increase in vol —this multiplier is applied to all levels of vol shocks (i.e., only linear sensitivity to vol shocks is captured).

### 7.3 Bear Stearns

Movements in the term structure of implied volatility are also modelled, using a four-factor model. The first factor is taken to be the 10-year swap rate change (rather than the change of a point on the vol term structure).<sup>10</sup> The second factor is the residual, from the first volatility regression, of the 5×5 (5-year option on a 5-year swap rate) swaption volatility change; the third factor is

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<sup>10</sup>This is closer to the duration/hedging approach used by the traders.

the residual, from the second vol regression, of the 3-month option on the 10-year swap rate; the fourth factor is the residual, from the third vol regression, of the 1-year option on the 2-year swap rate. Vol smile/skew is not modelled; the desk is doing some sensitivity analyses. Revals are based on partial sensitivities.

## 7.4 Lehman

## 7.5 Citi

☛ uses parametric MC . Citi uses a “parametric” VaR—i.e., assumes that the suite of risk factors follow a multivariate Normal distribution.

The basic risk factors are at-the-money Black implied volatilities of a standard set of caps and swaptions (namely, option maturities and tenors of the underlying rates)—thus, while the term structure of volatilities is captured, variation with moneyness is ignored. Correlations within this set of volatilities as well as with the associated rate curves are recognized for simulation purposes. Volatility moves at non-standard tenors are imputed by inter- and extrapolation.<sup>11</sup>

Sensitivities of vanilla caps and swaptions to the standard set of volatilities are straightforward to obtain. Non-vanilla instruments may be priced off different term structure models. Each model will possess a number of parameters which govern the rate movements generated by the model; the values of these parameters are obtained by *calibrating* the model to the standard set of volatilities—namely, choosing parameter values such that the model reproduces (quite closely) the market prices of the standard set of options. The resulting dynamics are used to price the payoff structures of the non-vanilla instruments. Sensitivities of the non-vanilla instruments to each standard volatility are therefore obtained by: (i) perturbing each standard volatility, one at a time; (ii) re-calibrating the model; (iii) re-pricing the trade—the resulting change in position value is the estimated sensitivity. Unlike vanilla options, non-vanilla options may have nonzero sensitivities to multiple points on the standard volatility term structure.

The “standard” set of ATM implied vols is supposed to consist of:

- Swaptions:

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<sup>11</sup>The MFVC update document supplied to us attaches some qualifiers suggesting that the risk factor is slightly less general than the main document indicates. E.g., caps of same maturity, but based on underliers of different tenors, use the same volatility and correlation.

Option maturities: 1M, 3M, 6M, 12M, 18M, 2Y, 3Y, 4Y, 5Y, 7Y, 10Y, 20Y

Rate tenors: 1Y, 2Y, 3Y, 4Y, 5Y, 7Y, 10Y, 15Y, 20Y, 30Y

- Caps:

Option maturities: 1Y, 2Y, 3Y, 4Y, 5Y, 7Y, 10Y, 20Y, 25Y

Rate tenors: 3M, 6M, 12M reset

It is assumed that changes in ATM implied volatilities are Normally distributed, and apparently all possible correlations (across all option maturities and rate tenors within a curve and between curves) are allowed for.

Revaluation: For each position, first-order, linear sensitivities to each of the above “benchmark” implied vols are computed as described above. Revals are computed by multiplying the simulated risk factor moves by these sensitivities.

## 8 FX products

### 8.1 Goldman Sachs

A parametric version is described—versus HistSim?

ATM implied vols for a number of maturities (1m, 2m, 6m, 12m, 2yr, and 10yr) appear to be used as risk factors. Changes in log-volatility are assumed to be proportional to the vol-of-vol and an innovation term, sampled from the 2-date bootstrap. No drift, no mean-reversion. However, the vol-of-vol is a time-varying parameter—estimated with decay from the history.

Cross-currency volatility term structures are included as risk factors for major ccy’s. For minor ccy’s, their crosses with major ccy’s appear to be the risk factors.

“Given the lack of skew in FX options, a single risk factor is used for each cross and maturity.”

(p. 6 of FX section ) **CHECK with Victor? —only for cross-ccy;**

### 8.2 Morgan Stanley

Reval: first-order, linear sensitivity only.

risk factor(s)?

: For risk reports,

### 8.3 Bear Stearns

Implied vol histories are apparently not available in sufficient detail. So the bank creates a history based on proxies as follows.

First, for each historical date, the realized volatility of the spot FX rate over the prior 3 months is computed. This itself is taken to be the applicable estimate of implied vol for a 3-month option at that historical date. More distant implied vols are assumed to decrease with the square root of time.

For options, a 2-dimensional (FX rate and implied vol) reval matrix/grid. The historical FX rate and implied vol (created as above) are fed to the reval grid to generate option revals.

### 8.4 Lehman

### 8.5 Citi

Arithmetic changes in ATM Black volatilities, also assumed to follow a joint normal distribution, specify the term structure. Moneyness effects are captured via risk factors for Risk Reversals and Strangles (10 and 25 delta).

FXRR: difference between IVcall - IVput of same delta (see RiskReversal.nb for figuring associated strikes, given imp vol). The FXRR can be viewed as bid/offer spread between a call and a put, the cost in volatility to reverse position from long to short, or vice-versa. The shocks are applied in a manner that the ATM vol and the Strangle are unchanged—by applying equal and opposite shocks to the call and the put. RR is said to be *highly correlated* with the spot.

FXST: Is the average of the implied volatilities of the same-delta call and put, less the ATM vol. Akin to aggregate volatility of a perfectly delta hedged position. Shocks are applied such that the ATM vol and the RiskReveraal are unchanged.

Revals shocks are 10bp.

Data: \* ATM vols for lots of ccy's from 1M to 120M.

\* FXRR and FXST: 1M, 2M, 3M, 6M, 9M, 12M, 24M, 36M, 48M, 60M.



## **Bear Stearns**

- In June 2007, two hedge funds sponsored by Bear Stearns Asset Management (“BSAM”) faced liquidity pressures due to illiquid investments in highly structured securities tied to subprime mortgages. Under broad pressure from market participants, The Bear Stearns Companies Inc. (“TBSCI”) agreed to provide replacement secured funding to the less levered of the two funds in the amount of \$3.2 billion. TBSCI ultimately funds \$1.8 billion of assets previously funded by other major investment and commercial banks.
- In July 2007, the two BSAM funds declare bankruptcy. The \$1.8 billion in collateral funded for the BSAM fund is seized by TBSCI when margin calls are missed.
- In August 2007, citing concerns about revenue generation and reputational and legal damage from the collapse of the BSAM funds, rating agencies put TBSCI on negative outlook. In an effort to assure markets, TBSCI management holds a conference call on a Friday which is not well-received, with comments about “the worst markets in 25 years” garnering press attention. Over the weekend, co-president Warren Spector, who was responsible for the BSAM businesses, is ousted.
- During Fall 2007, Bear Stearns enters discussions with Chinese securities firm CITIC about strategic alliance. One component of this deal is a reciprocal investment, which would have increased TBSCI’s regulatory capital. The deal does not come to fruition.
- In December 2007, TBSCI announces its first loss ever as a public company, with a key driver being losses on the BSAM positions taken onto TBSCI’s balance sheet in July.
- In January 2008, TBSCI’s stock price comes under persistent pressure.
- In February 2008, several market participants with significant positions in Alt-A residential mortgage securities experience distress, including Thornberg, Carlyle and Pelaton. The market for instruments referencing Alt-A collateral is significantly dislocated, and funding for such assets becomes difficult to obtain. Bear Stearns has significant exposure to Alt-A collateral.
- On March 10, 2008, the rating agencies downgrade a number of asset-backed securities underwritten by Bear Stearns. Due to the vagaries of subject line truncation, many blackberry subscribers believe that TBSCI has been downgraded. The stock price, already under pressure, moves sharply lower. Concerns among prime brokerage clients leads to substantial outflows of free credit balances.
- On March 11, 2008, the Federal Reserve announces a new program to provide secured funding of less liquid assets to investment banks, including TBSCI. Bear Stearns CEO speaks publicly, seeking to reassure markets that the company’s

liquidity position is strong and suggests that first quarter earnings will be positive. Nonetheless, pressure on the stock price and outflows of prime brokerage balances continues. Novations of credit derivatives, which entail counterparties to Bear Stearns assigning those contracts to other market participants, and thereby eliminating exposure to Bear Stearns, accelerates.

- On March 12, 2008, novations, prime brokerage outflows and pressure on the stock price continues. In an effort to squelch persistent liquidity rumors, Bear Stearns adopts a “pay first” policy with regard to collateral disputes on over-the-counter derivatives contracts. Over \$1 billion in disputed calls is paid.
- On March 13, 2008, the outflows from prime brokerage, pressure on stock price and wave of novations continued. While no significant amount of secured funding did not roll on Thursday, that evening a large number of funding counterparties indicated that they would not provide financing to Bear Stearns on Friday. In addition, a number of clearing banks indicated that they would not take interday exposure to the firm. Confronted with these prospects, the firm informed regulators that they would not be able to operate on Friday in normal fashion.
- Early March 14, 2008, the Federal Reserve announced that they would provide an emergency facility, through JP Morgan Chase, to stabilize Bear Stearns. However, the flow of cash from the firm and flight of secured funding counterparts continued, accelerating when the ratings agencies took significant action during the day.
- Over the weekend of March 15, Bear Stearns and JP Morgan Chase concluded a merger arrangement, with the Federal Reserve taking essentially an equity interest in approximately \$30 billion of assets.

## Lehman Brothers

- In March 2008, after the failure of Bear Stearns, Lehman Brothers came under immediate pressure, both in terms of equity prices, credit spreads, and counterparty perception. Of the four remaining investment banks, Lehman was considered to have the business model closest to Bear Stearns, one that while more diversified was still driven by fixed income securitization revenues. During the week following Bear's failure, Lehman experienced some pullback from secured funding counterparties and some noise in terms of counterparties alleging that they no longer could trade with Lehman. Most of these were cleared up through senior level conversations. Lehman moved up its Q1 earnings call by a few days, and announced that they had made a profit in the quarter and that the liquidity pool was at \$34b. The earnings call, led by new CFO Erin Callan, was generally considered to have been very well-received.
- At the end of March 2008, Lehman announces intentions to raise \$3b through a preferred convertible issuance. The offering is very well received by the market, and is increased to \$4b. The stock price remains stable into April, in the \$40 range. Credit spreads come in during the month as well, holding in the 190-220 range.
- In April, David Einhorn of Greenlight Capital publicly announced that he was shorting Lehman's stock. On May 21, after speaking with Erin Callan to address some of his concerns, he gave a speech at a widely attended conference questioning Lehman's valuations and stating that they were a risk to overall financial stability. The stock price, which had been in the mid-40s for much of April and early May, falls to \$39.56 on May 21, and never goes above 40 again.
- On June 9, Lehman pre-announces Q2 earnings. They posted their first quarterly loss as a public company. Net losses were \$2.8b, stemming primarily from write-downs on residential and commercial mortgage securities and hedges that did not perform as expected. They also announced a \$6b capital raise, and a liquidity pool that has grown to \$45b. In addition, they note that the firm has decreased balance sheet size and leverage, and has worked to reduce its illiquid assets by 15-20%. However, they still have over \$70b of illiquid assets, consisting of commercial and residential loans and securities and lending commitments. The full earnings call was scheduled for June 16. The stock price stays in the \$20 range for the month.
- On June 12, Erin Callan resigns, along with Joe Gregory, the firm's president.
- The earnings call is held on June 16 as scheduled, and is led by Ian Lowitt, the new CFO. The \$6b capital raise is completed.
- On June 24, numerous senior management changes are announced, including the return of Mike Gelband and Alex Kirk, two trading heads that left in 2007 and were considered to be more conservative risk managers.

- In July, the stock price is fairly volatile, and it becomes clear that Lehman will likely incur further losses on its residential mortgage portfolio as Alt-A securities fall in value.
- Throughout August, senior management looks for strategic investments, either through direct equity investors or by selling a piece of the highly regarded investment management division. As the size of the write-downs becomes clear, and sales of illiquid assets are slow, management looks for other ways to reduce the size of their exposure to these types of assets, and works to spin-off approximately \$30b commercial real estate assets, the bulk of their sizable exposure.
- In early September, speculation as to Lehman's strategic options continues to mount, as do loss estimates. At this point, the stock is trading in the mid teens.
- On September 7, more senior management changes are announced, including new heads of fixed-income and Europe.
- On September 9, the Koreans announce that they will not be taking a stake in Lehman, even though actual discussions between Lehman and the KDB ended some weeks prior to this. The stock falls from \$14.15 to \$7.79, and after the market closes Lehman announces that it will release earnings the morning of September 10.
- On September 10, Lehman announces a \$3.9b net loss, driven by \$7.8b of write-downs, predominantly in the residential mortgage space. They also announce plans to raise capital, sell the majority of the investment management business, and spin off their commercial real estate assets into a stand-alone entity. They do not announce any tangible actions, however, and after an initial stock price rally, the stock continues its fall, ending the day at \$7.25.
- Throughout the week, Lehman retains most of its secured funding lines, but its clearing banks demand more and more collateral. Novations begin to pick up on Thursday and Friday, as to prime brokerage outflows. The stock price ends Friday at \$3.65.
- Throughout the weekend, Lehman and the regulatory community work on possible solutions, including a sale to either Barclays or Bank of America. In the end, no sale is completed.
- On September 15, Lehman's holding company, LBHI, files for Chapter 11. In subsequent days, much of the US business is sold to Barclay's, and the Asian and European businesses are sold to Nomura.



U.S. Securities and Exchange Commission

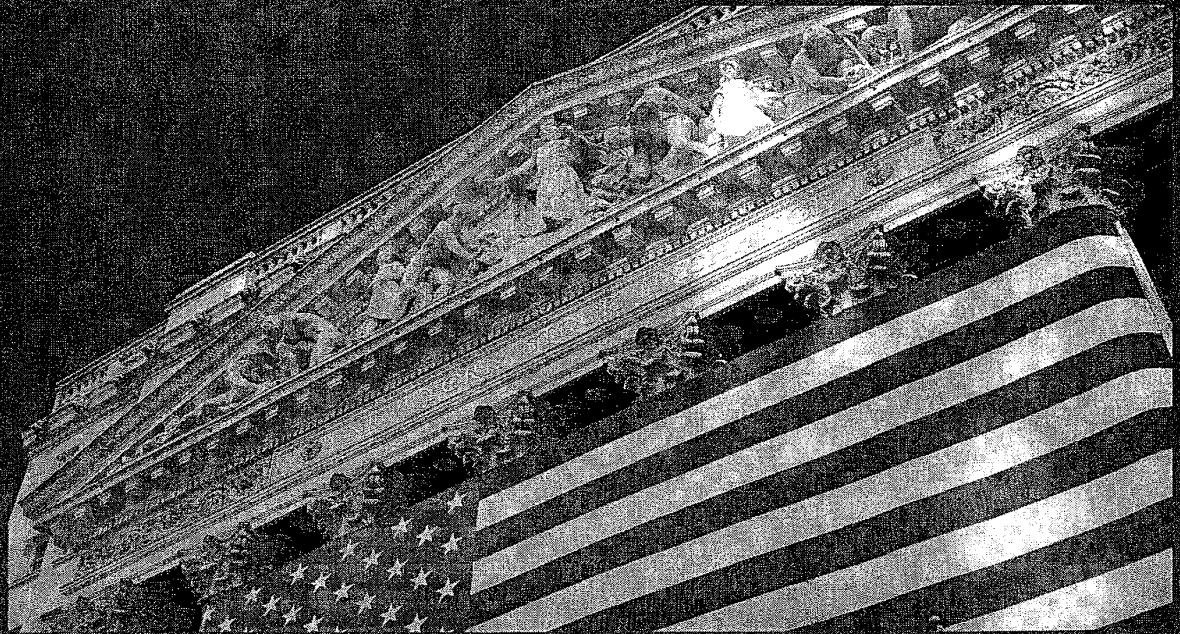
Office of Inspector General

Office of Audits

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# SEC's Oversight of Bear Stearns and Related Entities:

## Broker-Dealer Risk Assessment Program



Sections of this report have been redacted to delete information that SEC believes is non-public and confidential.

September 25, 2008  
Report No. 446-B




OFFICE OF  
INSPECTOR GENERAL

UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549

**MEMORANDUM**

September 25, 2008

**To:** Christopher Cox, Chairman  
Erik R. Sirri, Director, Division of Trading and Markets  
Lewis W. Walker, Office of Information Technology, Acting Director  
and Chief Information Officer

**From:** H. David Kotz, Inspector General 

**Subject:** *SEC's Oversight of Bear Stearns and Related Entities: Broker-Dealer Risk Assessment Program, Report No. 446-B*

This memorandum transmits the Securities and Exchange Commission, Office of Inspector General's final report, detailing the results of our audit on the Division of Trading and Market's (TM) Broker-Dealer Risk Assessment program. This audit was conducted pursuant to a Congressional request from Ranking Member Charles E. Grassley of the United States Senate Committee on Finance.

The final report contains 10 recommendations, which if implemented, should improve the Broker-Dealer Risk Assessment program. TM and the Office of Information Technology's (OIT) written responses to the draft report are included in their entirety in Appendix VI in the audit report. TM concurred with 9 of the report's 10 recommendations and OIT concurred with the two recommendations that pertained to OIT.

Should you have any questions regarding this report, please do not hesitate to contact me. We appreciate the courtesy and cooperation that you and your staff extended to our auditors during this audit.

Attachment

cc: Peter Uhlmann, Chief of Staff, Chairman's Office  
Diego T. Ruiz, Executive Director, OED  
Bob Colby, Deputy Director, TM  
Daniel M. Gallagher, Jr., Deputy Director, TM  
Michael A. Macchiaroli, Associate Director, TM  
Matthew J. Eichner, Assistant Director, TM  
Thomas K. McGowan, Assistant Director, TM  
Herb Brooks, Assistant Director, TM  
Kimberly L. Earle, Accountant, TM  
Patrice D. Pegram, Regulatory Specialist, TM  
Denise Landers, Senior Special Counsel, TM  
George R. Eckard, Assistant Director, OIT  
Srinivas Bangarbale, Assistant Director, OIT  
Daniel F. Lisewski, Branch Chief, OIT  
Juli Johnson, Configuration Management Specialist, OIT  
Joyce C. Hankins, Team Leader, OIT  
Remi Pavlik-Simon, Program Analyst, OIT  
Ann K. Lin, Systems Analyst, OIT  
Darlene L. Pryor, Business Analyst, OED

Rick Hillman, Managing Director of Financial Markets and Community  
Investment, GAO

# SEC Risk Assessment Program

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## Executive Summary

**Background.** Section 17(h) of the Securities and Exchange Act of 1934 was amended in 1990, and temporary rules 17h-1T and 17h-2T became effective in September 1992. These rules require broker-dealers that are part of a holding company structure with at least \$20 million in capital to file with the Commission disaggregated, non-public information on the broker-dealer, the holding company, and other entities within the holding company, and to maintain and preserve records and other information concerning entities related to the broker-dealer. Currently, there are 146 broker-dealers that file the *Risk Assessment Report for Brokers and Dealers* (Form 17-H or 17(h) documents) with the Commission under the Broker-Dealer Risk Assessment program.

The purpose of the Broker-Dealer Risk Assessment program is for staff in the Division of Trading and Markets (TM) to assess the risks to registered broker-dealers that may stem from affiliated entities, including holding companies and keep apprised of significant events that could adversely affect broker-dealers, customers and the financial markets. TM tracks the filing status of the 146 broker-dealers that file 17(h) documents with the Commission, but only reviews in detail the filings from six prominent firms, because they have a significant number of customer accounts and TM has, therefore deemed them to be material firms.

**Congressional Request.** On April 2, 2008, the Office of Inspector General (OIG) received a letter from Ranking Member Charles E. Grassley of the United States Senate Committee on Finance, requesting that the OIG analyze the Commission's oversight of Consolidated Supervised Entities (CSE) firms and broker-dealers subject to the Commission's Risk Assessment program.<sup>1</sup> This letter noted that TM was responsible for regulating the largest broker-dealers, and their associated holding companies. The letter requested that the OIG provide an update of findings made in its previous audit report on the Commission's Broker-Dealer Risk Assessment program (*Broker-Dealer Risk Assessment Program*, Report no. 354, issued on August 13, 2002).

The United States Senate Committee on Finance letter also requested a review of TM's oversight of the CSE it directly oversees, with a special emphasis on The Bear Stearns Companies, Inc (Bear Stearns). The letter requested that the OIG analyze how the CSE program is run, the adequacy of the Commission's monitoring of Bear Stearns, and to make recommendations to improve the Commission's CSE program.<sup>2</sup>

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<sup>1</sup> A copy of this request letter is attached to this report in full in Appendix II.

<sup>2</sup> The United States Senate Committee on Finance letter also requested that the Office of Inspector General (OIG) conduct an investigation into the facts and circumstances surrounding the Commission's decision to



**Objectives.** In response to the April 2, 2008 Congressional Request, the OIG conducted two separate audits with regard to the Commission's oversight of Bear Stearns and related entities. This audit's objectives were to follow up on the current status of recommendations made in the OIG's prior audit report of the Risk Assessment program (*Broker-Dealer Risk Assessment Program*, Report no. 354, issued on August 13, 2002); and to examine the Broker-Dealer Risk Assessment Process to determine whether improvements are needed.

The OIG performed a second audit of the Commission's CSE program. This audit's objectives were to evaluate the Commission's CSE program, emphasizing the Commission's oversight of Bear Stearns and to determine whether improvements are needed in the Commission's monitoring of CSE firms and its administration of the CSE program. The CSE program is a voluntary program that was created by the Commission in 2004, which allows the Commission to supervise certain broker-dealer holding companies on a consolidated basis. The report found that the Commission's oversight of Bear Stearns and the other CSE firms should be improved, the guidelines regarding the CSE firms' capital and liquidity requirements should be reassessed and the Commission, in consultation with the Board of Governors of the Federal Reserve, should determine whether leverage ratio limits should be imposed. The report also found that the Commission should adequately incorporate the CSE firms' concentration of securities into the CSE program's assessment of the firms' risk management systems, more aggressively prompt CSE firms to take action to mitigate such risks, and be more skeptical of the firms' risk models. The report contained 26 recommendations to improve the CSE program. Audit report number 446-A, examining the Commission's CSE program was issued simultaneously with this report on September 25, 2008.

**Prior OIG Audit Report.** The prior OIG report on the Broker-Dealer Risk Assessment program contained 14 recommendations to improve the program. TM addressed several of the prior OIG report's recommendations. However, one of the very significant recommendations in the prior OIG report stated that the Commission should update and finalize temporary rules 17h-1T and 17h-2T. As of this date, six years later, these temporary rules still have not been updated. The result is that several aspects of these rules are not effective mainly because they do not require firms to file certain pertinent information with the Commission and many filings are not reviewed by TM staff. Additionally, while TM has claimed that the rules currently require too many firms to file 17(h) documents with the Commission, TM has not taken any steps to update these rules.

The prior OIG report also recommended that TM explore the feasibility of having firms electronically file 17(h) documents. In 2005, TM in consultation with the Office of Information Technology launched the Broker-Dealer Risk Assessment (BDRA) system, which enables firms to file Form 17-H electronically. As of

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not pursue an Enforcement Action against Bear Stearns. This issue was addressed in an OIG investigative report dated September 25, 2008.

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Broker-Dealer Risk Assessment Program  
Report No. 446-B

September 25, 2008

September 2008, however, three years later, only 20 of the 146 firms filing 17(h) documents were filing electronically and the remaining firms still file paper documents.

**Results.** TM is not fulfilling its obligations in accordance with the underlying purpose of the Broker-Dealer Risk Assessment program in several respects. First, TM has failed to update and finalize the rules governing the program, which would ensure that broker-dealers file pertinent information with the Commission in a timely manner. Second, TM has failed to enforce the temporary rules' document retention and filing requirements that are incumbent upon broker-dealers. As a result, nearly one-third of the firms failed to file 17(h) documents as required by the rules. Third, even after the collapse of Bear Stearns, in March 2008, two related broker-dealers still exist, one of which carries a significant number of customer accounts. However, TM has not yet determined whether these broker-dealers are obligated to file Form 17-H. Fourth, although TM tracks the filing status of 146 broker-dealers that file quarterly and annual reports with the Commission, TM only conducts an in-depth review of the filings for six of the 146 firms that TM determined are most significant. TM generally does not review the filings for the remaining 140 firms, yet they are required to file under the Broker-Dealer Risk Assessment program. Fifth, TM does not timely process and review the filings from the six firms upon which its staff focus their review. Sixth and finally, TM does not maintain documentation to identify all of the broker-dealers that are exempt from the filing process.

TM's failure to carry out the purpose and goals of the Broker-Dealer Risk Assessment program hinders the Commission's ability to foresee or respond to weaknesses in the financial markets. This may impact TM's ability to protect customers from financial or other problems experienced by broker-dealers.

**Summary of Recommendations.** This report reasserts an OIG recommendation made in 2002, that TM should update and finalize temporary rules 17h-1T and 17h-2T, which govern the Broker-Dealer Risk Assessment program and enforce broker-dealer compliance with these rules. It is also critical for TM to determine whether the broker-dealers associated with Bear Stearns are required to file Form 17-H with the Commission in light of the significant amount of customer accounts carried by these broker-dealers. We also recommend that TM process all 17(h) filings in a timely manner, ensure that firms required to file Form 17-H actually file, and maintain documentation to identify all of the broker-dealers that are exempt from filing Form 17-H. We further recommend that TM aggressively encourage firms to file electronically with the Commission, and resolve the technical problems that have been identified with the BDRA filing system. A detailed list of our recommendations can be found in Appendix V.

TM concurred with 9 of the report's 10 recommendations and the Office of Information Technology (OIT) concurred with the two recommendations that pertained to OIT. Management's responses to the report are included in its

entirety in Appendix VI. OIG's response to Management's comments is included in Appendix VII.

# TABLE OF CONTENTS

Executive Summary.....	iii
Table of Contents .....	vii
Background and Objectives.....	1
Findings and Recommendations .....	6
Finding 1: TM Has Not Finalized Temporary Rules 17h-1T and 17h-2T Balances Are Not Fully Compliant .....	6
Recommendation 1 .....	9
Finding 2: TM Has Not Determined Whether Bear Stearns' Broker-Dealers are Subject to the Broker-Dealer Risk Assessment Program .....	10
Recommendation 2 .....	11
Finding 3: TM Does Not Enforce Compliance with Rules 17h-1T and 17h- 2T and Its Own Policies .....	12
Recommendation 3 .....	12
Recommendation 4 .....	13
Recommendation 5 .....	13
Finding 4: TM Does Not Process 17(h) Filings in a Timely Manner .....	14
Recommendation 6 .....	14
Finding 5: TM's List of Exempt Firms is Incomplete and Erroneous .....	14
Recommendation 7 .....	15
Finding 6: TM Has Not Effectively Encouraged Firms to Electronically File 17(h) Documents .....	16
Recommendation 8 .....	16
Finding 7: TM Should More Effectively Utilize the BDRA System.....	17
Recommendation 9 .....	17
Finding 8: Several Technical Problems Exist with the BDRA System that Need to be Addressed .....	17
Recommendation 10 .....	18

**Appendices**

Appendix I: Acronyms ..... 19  
Appendix II: Congressional Request for Audit ..... 20  
Appendix III: Scope and Methodology ..... 22  
Appendix IV: Criteria ..... 24  
Appendix V: List of Recommendations ..... 25  
Appendix VI: Management Comments ..... 28  
Appendix VII: OIG Response to Management's Comments ..... 36

# Background and Objectives

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## Background

In 1990, Drexel Burnham Lambert Group, Inc. (Drexel), the holding company of a formerly prominent broker-dealer, experienced financial difficulties. In a period of about three weeks and without the knowledge of the Commission or the New York Stock Exchange, approximately \$220 million of capital was transferred from the broker-dealer to its holding company, in the form of short-term loans. By the time the Commission learned about the transaction, Drexel or its associated entities had amassed a significant amount of short-term liabilities that were due to mature within a month and they could not meet these obligations. As a result, Drexel's broker-dealer filed for bankruptcy and was subsequently liquidated. This case illustrates that the financial difficulties of associated entities may lead to the demise of the broker-dealer itself.

Section 17(h) of the Securities and Exchange Act of 1934 (Exchange Act)<sup>3</sup> was added in 1990 by the Market Reform Act of 1990, and temporary rules 17h-1T and 17h-2T<sup>4</sup> became effective in 1992, following Drexel's collapse. These rules require broker-dealers with at least \$20 million in capital that are part of a holding company structure to file Form 17-H, *Risk Assessment Report for Brokers and Dealers* (Form 17-H or 17(h) documents) with the Commission and to maintain and preserve records and other information concerning the broker-dealer's Material Associated Persons (MAP).<sup>5</sup>

Form 17-H filings consist of disaggregated, non-public information on the broker-dealer, the holding company, and other entities within the holding company. Form 17-H consists of two parts and broker-dealers are required to file the form quarterly and also file an annual report with the Commission. Part I of Form 17-H requires reporting in four areas: (1) Organizational Structure; (2) Financing, Capital Adequacy and Risk-Management Policies and Procedures; (3) Pending Legal Matters and Contingencies; and (4) Consolidated and Consolidating Financial Data. Part II of the form requires reporting financial information about the broker-dealer's MAPs.

**TM's Program Oversight and Responsibilities.** The Division of Trading and Markets (TM) oversees the Broker-Dealer Risk Assessment program and is

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<sup>3</sup> 15 U.S.C. §78q(h).

<sup>4</sup> 17 C.F.R. §§ 240.17h-1T & 240.17h-2T.

<sup>5</sup> MAPs are defined as affiliates of broker-dealers that are subject to the 17(h) filing requirement. The determination of whether an entity is a MAP is made by the reporting broker-dealer, subject to Commission oversight and involves consideration of all aspects of the activities of, and the relationship between both entities as described in Rule 17h-1T.

responsible for receiving and reviewing 17(h) filings. The Broker-Dealer Risk Assessment program is staffed with a full-time regulatory specialist and a part-time Certified Public Accountant, who manage the program. The purpose of this program is for TM staff to assess the risks to registered broker-dealers that may stem from affiliated entities, including holding companies and to keep TM's staff apprised of significant events that could adversely affect broker-dealers, customers and the financial markets.

**Six Broker-Dealers Receive Comprehensive Reviews.** There are 146 broker-dealers that currently file 17(h) documents with the Commission.<sup>6</sup> However, TM only conducts a detailed review of six of the 146 broker-dealers' filings because TM designated these six firms as material broker-dealers based on their size and the significant amount of customer accounts that they carry. According to first quarter 2008 data provided by the Financial Industry Regulatory Authority (FINRA),<sup>7</sup> these six broker-dealers carry approximately 43 percent of the customer accounts and 11 percent of the free credit balances of all United States broker-dealers that are regulated by FINRA. Free credit balances represent the cash held by a broker in a customer's margin account that the customer can withdraw at any time, without restriction.

**Increased Monitoring of Select Broker-Dealers.** Of the 146 broker-dealers, 10 additional firms carry approximately 11 percent of the customer accounts and 3 percent of the free credit balances of all United States broker-dealers that are regulated by FINRA.<sup>8</sup> However, TM does not currently monitor these 10 firms on a regular basis, because TM does not believe they are as material as the 6 broker-dealers that it regularly monitors. TM may review information from these 10 filers if an issue arises. For example, if one of these firms experiences financial difficulties or undergoes a major change, TM may review the firm's 17(h) filings. TM has stated that it plans to monitor these firms on a regular basis in fiscal year 2008. As of August 2008, however, TM had not reviewed in detail any of these firms.

**Regulation of Firms Through the CSE and SIBHC Programs.** In addition to the 146 firms filing 17(h) documents, TM regulates six additional firms through the Commission's Consolidated Supervised Entity (CSE) program and one firm through the Commission's Supervised Investment Bank Holding Company (SIBHC) program. Thus, there are seven firms that are regulated under the CSE

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<sup>6</sup> It is possible that additional firms are required to file Form 17-H that are not filing either because the Commission is not aware of these firms or the Commission has not required these firms to file Form 17-H. This issue is discussed later in the report.

<sup>7</sup> FINRA is the largest non-governmental regulator for all securities firms doing business in the United States. FINRA oversees more than 5,000 brokerage firms. FINRA was created in July 2007 through the consolidation of the National Association of Securities Dealers and the regulation committee of the New York Stock Exchange.

<sup>8</sup> Source: FINRA Data as of March 31, 2008.

and SIBHC programs. The intent of the CSE and SIBHC programs is for the Commission to provide consolidated supervision at the holding company level. The CSE and SIBHC firms are required to file more comprehensive information with the Commission than is required under the Broker-Dealer Risk Assessment program and TM reviews these firms in greater depth than the 17(h) filers.

These seven firms carry approximately 21 percent of all customer accounts and 70 percent of all the free credit balances of all the broker-dealers that are regulated by FINRA.<sup>9</sup> Approximately 15 full-time TM personnel with backgrounds in finance and economics manage these programs.

**Overall Monitoring of Firms by the Commission and the Federal Reserve.**

According to FINRA data as of March 31, 2008, the firms monitored by the Commission through the Broker-Dealer Risk Assessment, CSE and SIBHC programs carry approximately 64 percent of the customer accounts and 80 percent of the free credit balances of all United States broker-dealers that are regulated by FINRA.

Additional firms regulated by the Board of Governors of the Federal Reserve System (Federal Reserve) constitute up to 24 percent of the customer accounts and up to 17 percent of the free credit balances of all United States broker-dealers that are regulated by FINRA.

Thus, total monitoring by either the Commission or the Federal Reserve constitutes as much as 88 percent of customer accounts and 97 percent of the free credit balances of all United States broker-dealers that are regulated by FINRA.

**Authority to Exempt Broker-Dealers from Filing Form 17-H.** Temporary Rule 17h-2T gives the Commission the authority to exempt broker-dealers from filing Form 17-H. Using its authority, TM may permit broker-dealers that it does not monitor in-depth, to only file Form 17-H on an annual basis (instead of quarterly) and only submit information as warranted by media sources and business developments.

**Staff Review of Filings.** TM staff has described its review of filings as follows. The organization chart is the starting point for its review. The organization chart sets forth the entities which are MAPs, associated broker-dealers and all other entities within the holding company.

TM staff focus on the consolidating financial statements, which identify each MAP, broker-dealer and significant unregulated entity in a separate column. TM staff review the consolidated financial statements for trends in financial condition

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<sup>9</sup> Source: FINRA Data as of March 31, 2008.



and operating results. The staff look at the parent company and unregulated entities' data for evidence of significant business, measured by revenues or balance sheet activity. If there is significant unregulated business within the holding company, staff analyze the nature, risk and profitability of the business to determine if it is supported by capital and the ability of the group to maintain liquidity during a downward trend in business or other event. TM staff look at inter-company money flows, liquidity, the types of assets held in each entity and the types of maturities of funding for the assets.

As warranted, TM staff may supplement filing reviews with on-site visits. TM staff have documented their review of broker-dealers' filings in written memoranda, which were provided to the program's Assistant Director. TM stated that the memoranda are still produced, however, the most recent written memorandum was dated August 2007. TM currently tracks quarterly financial data of the six firms it reviews in a spreadsheet.

**The BDRA Electronic Filing System.** The Broker-Dealer Risk Assessment (BDRA) system is an electronic filing system, created by the Office of Information Technology (OIT), in consultation with TM. The Commission started using the BDRA system in 2005. This system allows firms monitored under the Broker-Dealer Risk Assessment, CSE and SIBHC programs to submit required filings electronically. However, as of September 2008, only 20 of the 146 broker-dealers that are required to file 17(h) documents with the Commission have opted to use BDRA. In contrast, all seven of the firms monitored under the CSE and SIBHC programs use BDRA to file required documents.

## Objectives

As a result of the collapse of Bear Stearns in March 2008, we received a Congressional request to perform this audit of the Commission's Risk Assessment program, in addition to an audit of the Commission's CSE program (see Appendix II).

The objectives of this audit were to follow up on recommendations made in the OIG's prior audit report of the Risk Assessment program (Broker-Dealer Risk Assessment Program, Report no. 354, issued on August 13, 2002); and to examine the Commission's broker-dealer review process to determine whether improvements are needed.

The objectives of the audit on the Commission's CSE program were to evaluate the Commission's CSE program, emphasizing the Commission's oversight of Bear Stearns and to determine whether improvements are needed in the Commission's monitoring of CSE firms and its administration of the CSE program. The CSE program is a voluntary program that was created by the

Commission in 2004, which allows the Commission to supervise certain broker-dealer holding companies on a consolidated basis. The report found that the Commission's oversight of Bear Stearns and the other CSE firms should be improved, the guidelines regarding the CSE firms' capital and liquidity requirements should be reassessed and the Commission, in consultation with the Board of Governors of the Federal Reserve, should determine whether leverage ratio limits should be imposed. The report also found that the Commission should adequately incorporate the CSE firms' concentration of securities into the CSE program's assessment of the firms' risk management systems, more aggressively prompt CSE firms to take action to mitigate such risks, and be more skeptical of the firms' risk models. The report contained 26 recommendations to improve the CSE program. Audit report number 446-A, examining the Commission's CSE program was issued simultaneously with this report on September 25, 2008.

## Findings and Recommendations

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### Finding 1: TM Has Not Finalized Temporary Rules 17h-1T and 17h-2T

Temporary rules 17h-1T and 17h-2T were adopted in 1992, and TM has neither updated nor made the rules permanent, despite significant changes in broker-dealer operations and risks that have occurred since the temporary rules were implemented.

In August 2002, the OIG issued an audit report on the Broker-Dealers Risk Assessment program that contained 14 recommendations to improve the program. One of the most significant recommendations in the report was that the Commission needed to update and finalize temporary rules 17h-1T and 17h-2T. As of this date, six years later, these temporary rules have still not been updated or finalized.

TM's failure to update these rules has resulted in inefficiencies that include the Commission's receipt of numerous filings that TM does not review, while it does not receive all pertinent information from the firms that do file with the Commission. Instead of updating and finalizing the rules, TM has made informal policy decisions to compensate for the rules' shortcomings.

**TM Focuses Its Efforts on Only Six Broker-Dealers.** Currently, there are 146 broker-dealers that file 17(h) documents with the Commission. Rather than updating temporary rules 17h-1T and 17h-2T, TM's policy has been to focus its efforts on reviewing only six of the 146 broker-dealers that carry the largest number of customer accounts (43.18 percent) and comprise the most significant free credit balances (10.64 percent) of the more than 5,000 broker-dealers that are regulated by FINRA.<sup>10</sup>

TM reviews information from the remaining 140 filing firms only if a pertinent issue arises. For example, TM recently reviewed a 17(h) filing of a broker-dealer in order to provide information about the firm to another regulator. However, TM's review of these other 140 firms is sporadic and random and cannot be considered effective monitoring.

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<sup>10</sup> Source: FINRA Data as of March 31, 2008.

TM informed OIG that it plans to expand its review of 17(h) filings in 2008 to include an additional 10 of the 146 firms that file 17(h) documents. These firms carry approximately 11 percent of all customer accounts and 3 percent of all the free credit balances for all of the broker-dealers that are regulated by FINRA. As of August 2008, however, TM had not reviewed in detail any of these firms.

**Impact of the Gramm-Leach-Bliley Act on the Broker-Dealer Review Process.** The Gramm-Leach-Bliley Act (GLBA),<sup>11</sup> became effective on March 13, 2000, and significantly impacted temporary rule 17h-2(T). The Act permitted banks, securities firms and holding companies to affiliate with each other, and resulted in banks engaging in the securities business. As a result, the Federal Reserve became a principal regulator for certain securities firms subject to the Broker-Dealer Risk Assessment program's reporting requirements, which was not the case prior to the GLBA. Some of these securities firms are subject to filing Form 17-H.

TM made an internal and undocumented policy decision<sup>12</sup> to forgo the review of numerous 17(h) filings from broker-dealers that already had a principal regulator, such as the Federal Reserve or a foreign regulator. All reporting broker-dealers in the United States are regulated by FINRA and firms with a principal regulator have dual regulation. Therefore, TM has stated that it believes it is not necessary to review 17(h) filings from firms with principal regulators. However, temporary rule 17h-2(T) still requires these firms to file Form 17-H.

**Broker-Dealer Capital Threshold Should Be Increased.** Temporary rule 17h-2T requires all broker-dealers with at least \$20 million in capital that are part of a holding company structure to file 17(h) documents with the Commission. TM believes that the capital threshold that triggers the filing requirement should be raised so that fewer broker-dealers file Form 17-H. TM believes that the \$20 million capital threshold was appropriate in 1992, but that it is now too low, resulting in firms unnecessarily filing Form 17-H. Because of the threshold requirement, TM is receiving filings from 140 of 146 broker-dealers that it generally does not review. This has created an unnecessary filing burden for the firms and gives the impression that the Commission is monitoring and overseeing all 146 firms that are filing 17(h) documents and not just the six firms that TM reviews in detail. To the contrary, TM rarely, if ever reviews the filings from 140 firms.

While TM believes that temporary rule 17h-2T should be revised to increase the capital threshold, TM has not taken any measures to revise this rule or temporary rule 17h-1T. As such, 146 broker-dealers are required to file 17(h) documents with the Commission but TM does not review most of these filings. TM stated

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<sup>11</sup> Public Law 106-102 (Nov. 12, 1999).

<sup>12</sup> TM verbally informed OIG of this decision, which is not memorialized in writing.

that limited staff resources and a lack of prioritization have prevented its staff from revising and finalizing these rules.

In order to revise the temporary rules, TM must engage in a formal rulemaking process. The rulemaking process involves issuing a rule proposal for public review and comment and considering the public's views. The Commission then considers and incorporates the public's comments into the final rule, which is adopted by vote of the full Commission. Once adopted, the rule becomes a part of the official rules that govern the securities industry.

TM has avoided this formal rulemaking process in favor of making an internal and unwritten policy decision to not review many of the firms' 17(h) filings. This decision has ramifications for the 17(h) filers, the securities industry and the investing public.

**Temporary Rules Need to Be Updated.** In addition to any modification of the threshold requirements that TM believes should be made, the rules have additional shortcomings which require immediate revision as follows:

- The time allotted for broker-dealers to send quarterly and annual filings should be shortened to accommodate more timely receipt of information. Currently, broker-dealers have 60 and 105 days to send quarterly and annual filings, respectively. Firms are able to send this information in a much shorter time period. Receiving information 60 to 105 days after the quarter-end or year-end hinders TM's ability to timely review a firm's filings, because the data may no longer be relevant.
- The year-end financial statements that broker-dealers submit to the Commission should be audited. Currently, the financial statements are not required to be audited and as a result, may not comply with Generally Accepted Accounting Principles (GAAP).<sup>13</sup> Compliance with GAAP is important because it proscribes the standard guidelines to follow in preparing financial statements for private companies and companies trading publicly in the United States.
- The rules should be updated to allow TM to collect relevant information about risks posed by derivative products and transactions. The current rules only request peripheral information about a broker-dealer's derivative activities, such as the notional amounts. This information is currently provided in Part II of Form 17-H. This information does not provide TM with an overview of a firm's risks related to derivative activities; nor does it

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<sup>13</sup> Broker-dealers are generally required to file financial statements in accordance with GAAP. If the financial statements are not prepared in accordance with GAAP, the broker-dealers are required to disclose the accounting principles upon which the financial statements are based.

allow for TM to make an adequate assessment of a firm's current risk management activities and measurement criteria.

- All broker-dealers subject to filing Form 17-H should be required to file consolidating financial statements with the Commission. Broker-dealers that already have a principal regulator at the holding company level, such as the Federal Reserve or a foreign regulator are not required to file consolidating financial statements. The consolidating financial statements are one of the most useful parts of the filing because they provide information broken out by each affiliated entity of the broker-dealer. Information provided in this manner would provide TM with a greater understanding of a broker-dealer's business and each of its counterparts, and would enable TM to evaluate the potential impact of each entity on the broker-dealer.
- Broker-dealers should be required to file footnote disclosures that accompany the financial statements and the statement of cashflows. Broker-dealers are permitted to omit these items from the consolidating financial statements. The footnote disclosures are important because they disclose the accounting methodologies firms use to record and report transactions and details additional information that is omitted from the financial statements, such as the balance sheet and income statement. The statement of cash flows is important because it provides information regarding a company's cash receipts, cash payments and its ability to meet its short-term obligations.
- The organizational charts that broker-dealers file should be supplemented with a narrative description of each entity associated with the broker-dealer and its ultimate holding company. TM staff stated that the organization chart is the starting point for its review. If the organizational chart contained this additional information, it would further assist TM to understand a broker-dealer's operations and risks. Therefore, TM would be in a better position to respond to problems experienced by a broker-dealer.
- Rule 17h-1T should be revised to ensure that firms preserve all pertinent documents. Rule 17h-1T does not require broker-dealers to preserve all pertinent documents, such as information pertaining to derivative contracts and laws, which impacted broker-dealers after 1992, when temporary rule 17h-1T was implemented.

### **Recommendation 1**

Within six months from the issuance of this report, the Division of Trading and Markets (TM) should establish a timeframe to update and finalize temporary rules

17h-1T and 17h-2T. The new rules should reflect TM's Broker-Dealer Risk Assessment program's review process and program priorities. The rules should be revised to:

- Raise the capital threshold that triggers the 17(h) filing requirement (if TM believes the threshold is too high);
- Shorten the time allotted firms to send quarterly and annual 17(h) filings to the Commission;
- Require broker-dealers to file audited year-end financial statements;
- Allow for the collection of relevant information about risks posed by derivative products and transactions;
- Require all broker-dealers subject to filing Form 17-H to file consolidating financial statements with the Commission;
- Require broker-dealers to file the footnote disclosures that accompany the financial statements and the statement of cash flows;
- Require broker-dealers to supplement the organizational charts they file with a narrative description of each entity associated with the broker-dealer and its ultimate holding company;
- Require broker-dealers to preserve all pertinent documents; and
- Incorporate any additional changes that reflect TM's policy decisions on how to administer the Broker-Dealer Risk Assessment program.

## **Finding 2: TM Has Not Determined Whether Bear Stearns' Broker-Dealers are Subject to the Broker-Dealer Risk Assessment Program.**

Since the purchase of Bear Stearns in May 2008 by JP Morgan Chase & Co. (JP Morgan), TM has not determined whether Bear Stearns' broker-dealers are subject to filing Form 17-H with the Commission.

In mid-March 2008, Bear Stearns suffered a liquidity crisis at the holding company level and determined that unless it received outside funding (from the Federal Reserve or another lender) or the company was sold, it would be forced to file for bankruptcy protection. In May 2008, JPMorgan purchased Bear Stearns. This purchase resulted in JPMorgan becoming the parent company of two broker-dealers, that were formerly associated with Bear Stearns. These broker-dealers still exist, despite the collapse of the Bear Stearns holding company.

Prior to its collapse, TM regulated Bear Stearns as part of the CSE program and therefore, its broker-dealers were exempt from filing Form 17-H. Subsequent to its collapse, Bear Stearns' broker-dealers may now be required to file Form 17-H with the Commission. It is especially important for TM to determine whether these broker-dealers need to file Form 17-H because one of Bear Stearns' broker-dealers holds a significant percentage of customer accounts and free credit balances. Additionally, given the catastrophic collapse of Bear Stearns and serious questions that have been raised regarding the Commission's and the CSE program's monitoring of Bear Stearns, we believe that TM should have immediately contacted Bear Stearns to discuss its potential 17(h) filing requirements.<sup>14</sup>

In September 2008, the other four firms that are or were regulated in the Commission's CSE program had undergone significant changes.<sup>15</sup> These firms were in the process of being purchased or merged into other firms, or filed to be bank holding companies. It is possible that these other firms have broker-dealers as well and therefore, TM would also need to determine if these firms' broker-dealers would be subject to the 17(h) filing requirement.

TM informed OIG that it had not yet determined whether the Bear Stearns' broker-dealers are required to file Form 17-H, or if they are exempt from doing so because their new holding company, JP Morgan, is subject to filing documentation under the Commission's CSE program. TM further stated that if it is determined that the broker-dealers are required to file Form 17-H, to avoid receiving duplicate information, they will likely require only one broker-dealer to file Form 17-H with the Commission.

## **Recommendation 2**

The Division of Trading and Markets (TM) should determine whether Bear Stearns and the broker-dealers of the other CSE firms are required to file Form 17-H. If TM determines that these broker-dealers are required to file Form 17-H, the Division of Trading and Markets should enforce their compliance with this filing requirement and timely process and review these filings.

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<sup>14</sup> For a detailed discussion of the CSE program, see OIG report, *SEC's Oversight of Bear Stearns and Related Entities: The Consolidated Supervised Entity Program*, Report No. 446-A, September, 25, 2008, which was issued simultaneously with this report.

<sup>15</sup> These other four firms are Lehman Brothers Holdings, Inc., Merrill Lynch & Co., JP Morgan, and Goldman Sachs Group, Inc.



## **Finding 3: TM Does Not Enforce Compliance with Rules 17h-1T and 17h-2T and Its Own Policies**

TM does not have a mechanism in place to ensure that broker-dealers retain certain information and file 17(h) documents with the Commission, as required by Rules 17h-1T and 17h-2T, nor does TM enforce compliance with its own policies and procedures.

**Temporary Rule 17h-1T.** This rule requires broker-dealers subject to the Broker-Dealer Risk Assessment program to retain information about their risk management policy, financial data, securities and commodities position data, trading records and information concerning certain associated entities. However, TM does not monitor whether broker-dealers maintain this information and TM has not reminded the broker-dealers of this requirement. It is important for firms to retain this information because it is required by the rule and TM may need to rely upon this information if a firm experiences financial difficulties or undergoes a major change, or if the information is requested from sources internal or external to the Commission.

### **Recommendation 3**

At least annually, the Division of Trading and Markets should remind the broker-dealers subject to the Broker-Dealer Risk Assessment program of their obligation to retain the information specified in Rule 17h-1T. In addition, the Division of Trading and Markets should take appropriate steps to determine if the firms retain this information in accordance with Rule 17h-1T.

**Temporary Rule 17h-2T.** This rule requires certain broker-dealers to file 17(h) documents with the Commission. However, nearly one-third of the firms that are required to file Form 17-H failed to do so. In fact, according to TM's records, 47 of 146 firms and 44 of 146 firms failed to file Form 17-H for the fourth quarter of 2007 and third quarter of 2007, respectively.

Of the six firms that TM actively monitors, one firm failed to file its fourth quarter 2007 submission as of July 23, 2008. The submission was due March 31, 2008. Additionally, TM failed to process and review the fourth quarter filings for two firms as of June 24, 2008. These two submissions were due on March 31, 2008. This illustrates that TM is not effectively monitoring or timely reviewing information from the six firms that it claims it focuses its review upon.

TM acknowledged that it generally does not follow-up with firms that do not file Form 17-H because TM's staff would not likely review these filings even if the

firms submitted the documents. TM staff also admitted that there may be other firms that are subject to filing Form 17-H, but TM made an informal and undocumented policy decision to only contact non-filers when a firm's size is substantial and it holds customer assets. Finally, TM stated that some firms that consistently fail to file Form 17-H with the Commission may be exempt from filing, due to a merger with another firm. However, TM did not have supporting documentation to verify this assertion.

While TM made a policy decision to focus its review on only six out of 146 firms, temporary rule 17h-2T still requires filings from many firms that TM does not review. Until the temporary rules are revised, TM is responsible for ensuring that all of the firms required to file, are in fact filing. TM is also responsible for staying abreast of the information in the filings. This is important because if a firm collapses or experiences other problems, TM should readily have access to the firm's most recent information in order to respond timely to an incident or provide Commission staff with further information. The 17(h) filing information also assists the Commission to monitor the firms that file 17(h) documents.

#### **Recommendation 4**

The Division of Trading and Markets should establish a procedure to ensure that the required broker-dealers file Form 17-H in a timely manner and conduct reviews of the 17(h) filings in a timely manner.

**TM's Policies and Procedures.** TM's policies and procedures state that TM's quarterly review of the filings from the six firms it monitors should be documented with a one to two page memorandum describing TM's review, any findings or business developments, and note any discussions held with firm personnel. However, TM verbally told us that its policy only entails writing memoranda describing its review one time a year, after receiving the broker-dealers' annual filings, rather than quarterly as its policies and procedures require.

TM's most recent memoranda describing its review of the six firms it focuses its review upon were dated as early as November 1, 2006 and as late as August 30, 2007. This illustrates that TM is neither complying with its written policies and procedures to write quarterly memoranda, nor its verbal assertion to write annual memoranda.

We believe that TM should comply with its documentation requirement because this helps TM's staff to stay abreast of the broker-dealers' operations and new developments.

#### **Recommendation 5**

The Division of Trading and Markets should either comply with its written policy to document its review of quarterly 17(h) filings with a written memorandum

describing its review or update its written policy to reflect an appropriate way to ensure that its review of 17(h) filings is properly and adequately documented.

## **Finding 4: TM Does Not Process 17(h) Filings in a Timely Manner.**

We observed a large backlog of 17(h) filings that were waiting to be processed and filed by TM. This hampers TM's program staff from efficiently and effectively locating and reviewing pertinent information in the 17(h) filings.

We selected the ten firms that TM plans to review in 2008. From the date the filings were received by the Commission, it took TM from two to 112 days, with an average of 48 days, to process the filings.

Although we understand that TM has chosen not to review the majority of the 17(h) filings and believes that the rules should be updated to reflect this decision, the fact remains that temporary rule 17h-2T is still in place and requires all reporting broker-dealers to file Form 17-H with the Commission. As such, the Commission is responsible for, and therefore, should process these filings in a timely manner. Timely processing of these filings would provide the Commission with the information needed in order to respond in a timely manner to a major problem or change that a firm may experience.

### **Recommendation 6**

The Division of Trading and Markets should establish a procedure to ensure that its staff process and disseminate the 17(h) filings in a defined period of time, which ensures that the information in the filings is current and relevant when the filings are processed.

## **Finding 5: TM's List of Exempt Firms is Incomplete and Erroneous**

TM does not maintain adequate documentation in support of the firms that it listed as being exempt from filing Form 17-H.

TM staff provided OIG with a list of 112 firms they identified as being exempt from filing Form 17-H. TM said some firms were exempt because they had merged with another firm, or they otherwise no longer met the requirements for

filing Form 17-H. TM maintains information in its file room on firms that are exempt from filing Form 17-H.

Of the list of 112 firms that TM identified as being exempt from filing Form 17-H, we judgmentally selected 20 firms from this list to determine if there was documentation to support the exemption.<sup>16</sup> Of the 20 firms we reviewed, the OIG found that:

- In 14 cases, TM could not locate the related file or the proof of exemption. One firm that was on the exemption list was one of the six firms that TM reviews; and
- In six cases, TM located the files. In three of the six cases, we found proof of each firm's exempt status in TM's files. In the remaining three cases, proof of each firm's exempt status was not in the file, but TM staff provided OIG with information from a non-Commission system, which substantiated these firms' exempt status.

We also randomly selected TM's files of six firms, that TM indicated were exempt from filing Form 17-H.<sup>17</sup> Our purpose was to determine if these firms were included in TM's list of 112 exempt firms. From the six firms we selected, only three were on TM's list of exempt firms.

These reviews illustrated that TM does not maintain adequate documentation to support its assertion that certain broker-dealers are exempt from filing Form 17-H. Accordingly, TM's list of exempt firms is erroneous and incomplete. It is important for TM to maintain this documentation and to have an accurate and complete list of exempt firms to better ensure that TM does not mistakenly exempt any firms from the review process.

#### **Recommendation 7**

Within three months after the issuance of this report, the Division of Trading and Markets (TM) should develop and maintain a current list, with supporting documentation, which identifies all of the broker-dealers that are exempt from filing Form 17-H. TM should continuously update this list as new firms are exempted from filing Form 17-H.

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<sup>16</sup> See Appendix III for the sampling methodology that was used.

<sup>17</sup> See Appendix III for the sampling methodology that was used.

## **Finding 6: TM Has Not Effectively Encouraged Firms to Electronically File 17(h) Documents**

Only 20 of the 146 firms that TM collects Form 17-H from file electronically using the BDRA system.

The OIG report, issued in August 2002, recommended that TM explore the feasibility of having firms electronically file 17(h) documents. In 2005, TM in consultation with OIT launched the BDRA system, which enables firms to file electronically. TM's policies and procedures state that TM will place additional emphasis on encouraging firms to file Form 17-H electronically. TM has also acknowledged that electronic filing is preferable to receiving paper filings.

Currently, however, three years later, only 20 of the 146 firms from which TM collects Form 17-H from file electronically using the BDRA system. Of the six firms that TM reviews, only two firms file electronically. In contrast, all seven firms that TM monitors through the CSE and SIBHC programs file electronically using the BDRA system. While TM has made some efforts to encourage additional firms to file electronically, TM has not aggressively encouraged firms to use the BDRA system.

The Government Paperwork Elimination Act<sup>18</sup> and the E-Government Act of 2002<sup>19</sup> were enacted to promote the use and availability of electronic methods to interact with Federal government agencies. These Acts encourage Federal Agencies to allow individuals or entities that deal with the Federal Government the option to submit information or transact electronically. In accordance with these Acts, TM should more aggressively encourage firms to file 17(h) documents using the BDRA system.

Additionally, electronic filing is more secure, it would improve the timeliness of the filings and all Commission staff with access to BDRA could simultaneously view the filings. Electronic filing would also eliminate TM's processing backlog of paper filings.

### **Recommendation 8**

The Division of Trading and Markets should aggressively encourage firms to file electronically using the BDRA system. The Division of Trading and Markets should especially encourage the firms that it reviews to file electronically. This could be accomplished by calling the firms and periodically sending the firms information on how to file electronically.

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<sup>18</sup> Public Law 105-277 (October 21, 1998).

<sup>19</sup> Public Law. 107-347 (December 17, 2002).

## **Finding 7: TM Should More Effectively Utilize the BDRA System**

TM is not using the BDRA system to store information about the firms it reviews or to produce management reports.

Currently, TM only uses the BDRA system as a portal to store filings. TM staff could better utilize the system by storing in BDRA financial information about the firms it reviews, staff notes and written documents. It could also use the system to generate management reports. Currently, TM's staff maintain documentation on the firms they review in their own files or on TM's shared drive. Storing this information in the BDRA system would be beneficial because the data would be more centrally organized and would enable TM staff to generate management reports.

TM has already discussed these capabilities with OIT. The BDRA system currently allows TM to store staff notes in BDRA. OIT would need to be further configured to enable it to create financial information and to generate management reports.

### **Recommendation 9**

In coordination with the Office of Information Technology, the Division of Trading and Markets (TM) should ensure that the BDRA system includes financial information, staff notes and other written documentation about the firms TM reviews and that BDRA is used to generate management reports.

## **Finding 8: Several Technical Problems Exist with the BDRA System That Need to be Addressed.**

Technical problems exist with the BDRA system, thus hampering the system's effectiveness and firms' willingness to file electronically with the Commission.

**The BDRA System.** Although the BDRA system has several features that could assist TM with its review of 17(h) filings as described above, the BDRA system has several problems as follows, which can be resolved:

- Only parts of a filing appear in the BDRA system if TM staff access the information in a particular manner. OIT stated that it is reviewing the BDRA system to identify and fix this problem.

- A digital signature does not consistently accompany filings that firms upload into BDRA. A digital signature is an electronic signature that can be used to authenticate the identity of the sender of a message or the signer of a document. The digital signature is important because it helps ensure that information the broker-dealers send to the Commission has not been altered. OIT stated that the BDRA system needs to be reprogrammed to ensure the firms include this signature.
- If a filing is larger than 16 megabytes, the entire filing will not upload into BDRA. TM has told firms to check the size of their filings prior to uploading them and to divide filings over 16 megabytes into more than one submission. TM stated that it plans to work with OIT to see if the system can be configured to allow users to upload filings greater than 16 megabytes in one submission.

In addition to filings greater than 16 megabytes, TM also told us that filings less than 16 megabytes do not consistently upload into BDRA. For example, in August 2008, a filing that was only eight megabytes failed to upload into BDRA.

- Users were unable to access the BDRA system for at least two days in June 2008. OIT stated that the system was inoperable because it was making changes to the system.

#### **Recommendation 10**

The Office of Information Technology, in coordination with the Division of Trading and Markets, should ensure that technical problems with the BDRA system are resolved so that:

- All filings in the BDRA system can be properly and fully accessed;
- A digital signature accompanies all required filings;
- All filings, including those that are greater than and less than 16 megabytes, can be completely and accurately uploaded into BDRA in one submission; and
- Access to the BDRA system is consistently available to users and TM should promptly notify all users when it is unavailable.

## Acronyms

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BDRA	Broker Dealer Risk Assessment
CSE	Consolidated Supervised Entity
FINRA	Financial Industry Regulatory Authority
GAAP	Government Accepted Accounting Principles
GLBA	Gramm-Leach-Bliley Act
MAP	Material Associated Person
OIG	Office of Inspector General
OIT	Office of Information Technology
SIBHC	Supervised Investment Bank Holding Company
TM	Division of Trading and Markets



## Congressional Request for Audit

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**United States Senate**  
COMMITTEE ON FINANCE  
WASHINGTON, DC 20510-6200

April 2, 2008

### **Via Electronic Transmission**

The Honorable David Kotz  
Inspector General  
US Securities and Exchange Commission  
100 F Street, NE  
Washington, DC 20549-2736

Dear Inspector General Kotz:

According to regulatory filings and a December 2007 *Wall Street Journal* article, the SEC Enforcement Division declined to bring a case against Bear Stearns for improperly valuing mortgage-related investments. Given the later collapse and federally backed bail-out of Bear Stearns, Congress needs to understand more about this case and why the SEC ultimately sought no enforcement action.

Moreover, I am particularly interested in this case in light of the SEC's failed investigation of Pequot Capital Management. As you know, in the final report of the Senate's inquiry into that matter, we found that senior SEC officials showed extraordinary deference to a particular witness because of his "prominence" as the head of Morgan Stanley.

### **Request for Investigation**

In light of my earlier investigation I need to know whether the same problems identified in the Pequot investigation were repeated in the Bear Stearns case. Accordingly, I request that you conduct a thorough investigation into the facts and circumstances surrounding the decision to not pursue an enforcement action against Bear Stearns. Please provide a final report on whether there was any improper action or misconduct relating to SEC investigation of Bear Stearns and its decision to close the investigation. The report should also describe and assess:

1. the nature, extent, and propriety of communications between Bear Stearns executives or their representatives and senior SEC officials;

2. the decision-making process which led to the SEC's failure to bring an enforcement action following the drafting of a Wells notice;
3. the reasons for declining to proceed with an enforcement action; and
4. the degree to which more aggressive action by the Enforcement Division may have led to an earlier and more complete understanding of the issues that contributed to the collapse of Bear Stearns.


### Request for Audit

In addition to this investigative request, I would also like your office to follow-up on previous audit work relevant to issues surrounding Bear Stearns. The Division of Trading and Markets (Division) is responsible for regulating the largest broker-dealers and the associated holding companies. Offices within the Division are staffed with accountants and economists who are responsible for reviewing the market and credit-risk exposures of the broker dealers. Their review includes assessing broker-dealers' quarterly financial filings, ensuring broker-dealers are meeting net-capital requirements and that other financial ratios, such as liquidity ratios, are adequate. There is a special emphasis in reviewing the five very large broker-dealers, including Bear Stearns, known as the Consolidated Supervised Entity (CSE) Program. The Division staff exercises additional oversight of these firms and examines their risk models.

I understand that the OIG conducted a prior audit of these responsibilities in 2002. Please provide an update of the previous findings, determine whether earlier recommendations were implemented, and analyze the current function of these offices. The review should include a description and assessment of their missions, how the programs are run, their policies and procedures, the adequacy of any reviews conducted regarding Bear Stearns, and recommendations for improvements in the process.

If you have any questions about these requests, please contact Jason Foster or Emilia DiSanto at (202) 225-4515.

Sincerely,



Charles E. Grassley  
Ranking Member

## Scope and Methodology

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We conducted this performance audit in accordance with generally accepted government auditing standards. These standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

**Scope.** We obtained from TM, information showing all the firms currently filing Form 17-H, delinquent filers, exempt firms and sample 17(h) filings. We obtained information illustrating TM's review of six firms and related financial information from 2006 to 2008. We obtained information allowing us to test TM's timeliness in processing filings. We obtained information showing the status of TM's implementation of prior OIG audit recommendations on this program (*Broker-Dealer Risk-Assessment Program*, Audit No. 354, August 13, 2002). We also obtained information from FINRA showing the amount of customer accounts and free credit balances held by reporting broker-dealers as of March 31, 2008.

We conducted our fieldwork from April 2008 to August 2008. We reviewed documentation on the Broker-Dealer Risk Assessment program covering the years 2006 to 2008.

**Methodology.** We reviewed TM's policies and procedures governing the Broker-Dealer Risk Assessment program, documentation showing all firms that file Form 17-H and documents showing delinquent filers and exempt firms. We also reviewed documentation of TM's review of 17(h) filers. We reviewed and relied upon workpapers from our prior audit report on this program (*Broker-Dealer Risk-Assessment Program*, Audit No. 354, issued August 13, 2002). In addition, we held discussions with representatives from TM and OIT to learn about the program and to discuss and confirm our findings.

We conducted detailed testing to determine whether TM enforced compliance with temporary rules 17h-1T and 17h-2T and whether TM complied with its policies and procedures. We also performed testing to measure TM's timeliness in processing filings, and to determine the accuracy of TM's list of exempt firms. We analyzed data from FINRA to determine the amount of customer assets and free credit balances that were attributable to filing and non-filing broker-dealers.

**Internal/Management Controls.** We reviewed internal/management controls as they pertained to the objectives of our audit.

**Use of Computer-Processed Data.** We determined the number of firms that file electronically by relying on data from the Commission's BDRA system. Firms use the BDRA system to transmit filings electronically to TM. The BDRA system does not process any of the data contained in the filings but rather only stores the filings in electronic format. As a result, we considered the relevant risks to be:

- TM's failure to receive a filing sent by a firm; and
- Whether information in the BDRA system could be compromised (information security risks).

We identified an instance where TM failed to receive a filing that a firm transmitted through BDRA and where only parts of filings could only be viewed if TM staff accessed the BDRA system in a particular way. During the audit TM was working with OIT to address these issues.

We considered the risk surrounding information security. In July 2008, OIT certified and accredited the BDRA system, as required by the Federal Information Security Management Act of 2002. Therefore, we believe that we can rely upon the information in the BDRA system as it pertains to information security.

**Judgmental Sampling.** TM provided us with a list of 112 firms considered exempt from the 17(h) filing process. We judgmentally selected every fifth firm on the list (22 firms) to determine if TM had documentation on file indicating that the firms were actually exempt from filing Form 17-H. We deleted two firms from our sample because they were CSE firms, which are no longer part of the Broker-Dealer Risk Assessment program.

TM stores information on exempt firms in file folders in a file room. Each folder contains information on a particular firm. We randomly selected six folders to determine if the firms were included in TM's list of exempt firms.

In another analysis we selected the ten firms that TM plans to review in the near future and measured how long it took TM to process these filings, from the date the Commission received the filings. We originally tried to review processing times for the six firms that TM is currently reviewing, but this information was not available.

**Prior Audit Coverage.** From March to May 2002, the OIG audited and assessed the Commission's Risk Assessment program and issued a related report *Broker-Dealer Risk-Assessment Program*, Report No. 354, August 13, 2002. The report contained 14 recommendations aimed to improve the program.

## Criteria

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**Final Temporary Risk Assessment Rules.** Governs the Broker-Dealer Risk Assessment program. Adopted July 16, 1992 in Commission Release no. 34-30929.

**A Study and Evaluation of the Effectiveness of the Final Temporary Risk Assessment Rules.** Issued December 1996. Discusses the effectiveness of the Risk Assessment Rules.

**TM's Policies and Procedures Governing the Broker-Dealer Risk Assessment program.** Issued September 2007. Discusses TM's review of 17(h) filings and the purpose of the program.

**Report to the Congress on Financial Holding Companies under the Gramm-Leach-Bliley Act.** Issued November 2003. Discusses how the implementation of the Gramm-Leach-Bliley Act, enacted on November 12, 1999, permitting banks, securities firms and holding companies to affiliate with one another and the effects of the Act on regulated entities.

**The Government Paperwork Elimination Act.** Enacted on October 21, 1998. The Act is designed to improve customer service and governmental efficiency through the use of information technology.

**The E-Government Act of 2002.** Enacted on December 17, 2002. This Act was designed to promote the use of the Internet and other information technologies to improve government services for citizens, internal government operations, and opportunities for citizen participation in government.

## List of Recommendations

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### Recommendation 1

Within 6 months from the issuance of this report, the Division of Trading and Markets (TM) should establish a timeframe to update and finalize temporary rules 17h-1T and 17h-2T. The new rules should reflect the TM's Broker-Dealer Risk Assessment program's review process and program priorities. The rules should be revised to:

- Raise the capital threshold that triggers the 17(h) filing requirement (if TM believes the threshold is too high);
- Shorten the time allotted firms to send quarterly and annual 17(h) filings to the Commission;
- Require broker-dealers to file audited year-end financial statements;
- Allow for the collection of relevant information about risks posed by derivative products and transactions;
- Require all broker-dealers subject to filing Form 17-H to file consolidating financial statements with the Commission;
- Require broker-dealers to file the footnote disclosures that accompany the financial statements and the statement of cash flows;
- Require broker-dealers to supplement the organizational charts they file with a narrative description of each entity associated with the broker-dealer and its ultimate holding company;
- Require broker-dealers to preserve all pertinent documents; and
- Incorporate any additional changes that reflect TM's policy decisions on how to administer the Broker-Dealer Risk Assessment program.

### Recommendation 2

The Division of Trading and Markets (TM) should determine whether Bear Stearns and the broker-dealers of the other CSE firms are required to file Form 17-H. If TM determines that these broker-dealers are required to file Form 17-H, the Division of Trading and Markets should enforce their compliance with this filing requirement and timely process and review these filings.

### Recommendation 3

At least annually, the Division of Trading and Markets should remind the broker-dealers subject to the Broker-Dealer Risk Assessment program of their obligation to retain the information specified in Rule 17h-1T. In addition, the Division of Trading and Markets should take appropriate steps to determine if the firms retain this information in accordance with Rule 17h-1T.

**Recommendation 4**

The Division of Trading and Markets should establish a procedure to ensure that the required broker-dealers file Form 17-H in a timely manner and conduct reviews of the 17(h) filings in a timely manner.

**Recommendation 5**

The Division of Trading and Markets should either comply with its written policy to document its review of quarterly 17(h) filings with a written memorandum describing its review or update its written policy to reflect an appropriate way to ensure that its review of 17(h) filings is properly and adequately documented.

**Recommendation 6**

The Division of Trading and Markets should establish a procedure to ensure that its staff process and disseminate the 17(h) filings in a defined period of time, which ensures that the information in the filings is current and relevant when the filings are processed.

**Recommendation 7**

Within three months after the issuance of this report, the Division of Trading and Markets (TM) should develop and maintain a current list, with supporting documentation, which identifies all of the broker-dealers that are exempt from filing Form 17-H. TM should continuously update this list as new firms are exempted from filing Form 17-H.

**Recommendation 8**

The Division of Trading and Markets should aggressively encourage firms to file electronically using the BDRA system. The Division of Trading and Markets should especially encourage the firms that it reviews to file electronically. This could be accomplished by calling the firms and periodically sending the firms information on how to file electronically.

**Recommendation 9**

In coordination with the Office of Information Technology, the Division of Trading and Markets (TM) should ensure that the BDRA system includes financial information, staff notes and other written documentation about the firms TM reviews and that BDRA is used to generate management reports.

**Recommendation 10**

The Office of Information Technology, in coordination with the Division of Trading and Markets (TM), should ensure that technical problems with the BDRA system are resolved so that:

- All filings in the BDRA system can be properly and fully accessed;
- A digital signature accompanies all required filings;

## Appendix V

- All filings, including those that are greater than and less than 16 megabytes, can be completely and accurately uploaded into BDRA in one submission; and
- Access to the BDRA system is consistently available to users and TM should promptly notify all users when it is unavailable.



## Management Comments (TM)

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### DIVISION OF TRADING AND MARKETS MANAGEMENT COMMENTARY

The Division of Trading and Markets ("Division") appreciates the opportunity to comment on the Office of Inspector General ("OIG") Report "SEC Risk Assessment Program."

1. The Division acknowledges that the risk assessment rules promulgated under Section 17(h) of the Exchange Act ("the 17(h) rules") need to be reviewed and modified to assure that relevant information is collected from an appropriate set of firms to meet the objective of the program, namely to assess the risks to registered broker-dealers that may stem from activities conducted in affiliates. Review of the rule set has already begun. The effort will accelerate with the arrival of a new attorney who is scheduled to begin work on September 29. The Division believes that essentially all of the issues raised in the OIG report will be addressed through an appropriate revision of the rules. For example, such an effort can assure that an appropriate population of broker-dealers is filing risk assessment information, and mandate that this information be filed electronically.
2. As noted in the Division's informal comments to OIG, the staff is concerned that the report repeatedly describes the program as reviewing "only" six firms in detail. The report does not recognize the compelling reason for focusing limited resources on six firms: these six firms, together with the firms supervised by the Commission or the Federal Reserve at the consolidated level, hold substantially all customer free credit balances.

More specifically, as of the first quarter 2008, some \$605 billion in total free credit balances are held by firms filing Form 17-H (or former filers now exempted because of CSE or SIBHC status). Broker-dealers affiliated with the CSE firms supervised by the Commission on a consolidated basis account for \$356 billion of this \$605 billion. Broker-dealers affiliated with holding companies supervised by the Federal Reserve, as either a US Bank Holding Company or a Foreign Banking Organization, account for another \$175 billion of the total. Thus only \$74 billion in free credit balances are held at broker-dealers affiliated with holding companies not subject to Commission or Federal Reserve supervision.

The risk assessment program focused on six of these firms, which account for \$60 billion of that \$74 billion in free credit balances. This focus accords with the aims of the 17(h) rules to assess risks that affiliates might pose to the broker-dealer. The remaining 140 firms that file Form 17-H but are not reviewed in depth account for only \$14 billion of free credit balances, or 2.3 percent. While the staff believes that

the current allocation of resources is compelling, the staff also recognizes that additional efficiencies can be gained by revising the 17(h) rules.

3. As noted in the Division's informal comments to OIG, the report suggests that the Division's responsibilities with regard to the 17(h) rules are unusually broad. Finding 3 suggests that the Division should "enforce" compliance with Rules 17h-1T and 17h-2T. The report also recommends that the Division at least annually "should remind broker-dealers subject to the 17(h) Risk Assessment Program of their obligation to retain the information specified." Given that these requirements are mandated by rules, the staff believes that registrants must fulfill obligations even without prompting from the SEC, and instituting a systematic process of providing "reminders" could inadvertently weaken the Commission's position when taking action against registrants in cases of non-compliance with other rules and requirements.
4. As noted in the Division's informal comments to OIG, the staff does not believe that the issue involving the Bear Stearns merger is sufficiently material to be one of the eight primary findings in the report. The matter is one of minimal substance that will be resolved in due course along with numerous other open issues associated with the Bear Stearns – JP Morgan merger ("Merger"). The Merger resulted in two broker-dealers, Bear Stearns & Co. and Bear Stearns Securities Corporation, becoming affiliates of JP Morgan, a bank holding company overseen by the Federal Reserve on a consolidated basis. Therefore, prior to the Merger, comprehensive holding company information was provided by The Bear Stearns Companies Inc. pursuant to the CSE rules. Subsequent to the Merger, comprehensive holding company information (although in reduced quantity due to the Federal Reserve's role as holding company supervisor) is filed by JP Morgan pursuant to the CSE rules. In both cases, the information serves the purposes of the 17(h) rules, namely to allow for assessing the potential risks to the registered broker-dealers. In addition, the information provided pursuant to the CSE rules both before and after the merger constitutes a superset of the information required under the 17(h) rules. Discussions are still ongoing among the Commission, JP Morgan, and FINRA regarding which of the broker-dealers of the merged entity will be reorganized and how this will occur. When this is resolved, one of the surviving entities will request to be designated as the reporting broker-dealer for purposes of the 17(h) rules. Obviously, similar determinations may be necessary to the extent that other broker-dealers have been involved in corporate reorganizations or otherwise subject to changes in regulatory status.
5. As noted in its informal comments to OIG, the Division believes that there is unnecessary, negative language throughout the report, especially in the Executive Summary. We believe that this language is unfair and does not accurately describe the issues presented. Just to highlight several instances: The report finds that "TM is not fulfilling its obligations." The report also opines that "[a]dditionally, given the catastrophic collapse of Bear Stearns and serious questions that have been raised

regarding the Commission's and CSE program's monitoring of Bear Stearns, we believe that TM should have immediately contacted Bear Stearns to discuss its potential 17(h) filing requirements." After noting that "TM reviews information from the remaining 140 firms only if a pertinent issue arises," this approach is described as "sporadic and random." The report notes that rules have not been updated due to a "lack of prioritization," rather than reflecting the fact that other projects were accorded a higher priority.

**Please indicate your concurrence or non-concurrence with each recommendation that applies to your Division or Office.**

**Recommendation 1: Within 6 months from the issuance of this report, the Division of Trading and Markets should establish a timeframe to update and finalize temporary rules 17h-1T and 17h-2T. The new rules should reflect the Division of Trading and Market's 17(h) program review process and program priorities.**

The Division concurs with this recommendation, and has already begun the process of addressing the need to revise the cited rules.

**Recommendation 2: The Division of Trading and Markets should determine whether Bear Stearns and the broker-dealers of the other CSE firms are required to file Form 17-H. If TM determines that these broker-dealers are required to file Form 17-H, the Division of Trading and Markets should enforce their compliance with this filing requirement and timely process and review these filings.**

The Division concurs, and will make these determinations per usual course. However, as described in more detail in the management response, the staff is confident in the case of Bear Stearns that all relevant information to permit assessment of risks to the broker-dealers affiliated with JP Morgan is currently being provided.

**Recommendation 3: At least annually, the Division of Trading and Markets should remind the broker-dealers subject to the 17(h) Risk Assessment Program of their obligation to retain the information specified in Rule 17h-1T. In addition, the Division of Trading and Markets should take appropriate steps to determine if the firms retain this information in accordance with Rule 17h-1T.**

The Division does not concur that broker-dealers should be notified to comply with Commission rules, for the reasons noted in the management response.

**Recommendation 4: In accordance with Rule 17h-2T, the Division of Trading and Markets should establish a procedure to ensure that the required broker-dealers file Form 17-H in a timely manner and conduct reviews of the 17(h) filings in a timely manner.**

The Division concurs.

**Recommendation 5: The Division of Trading and Markets should either comply with its written policy to document its review of quarterly 17(h) filings with a written memorandum describing its review or update its written policy to reflect an appropriate way to ensure that its review of 17(h) filings is properly and adequately documented.**

The Division concurs, but notes that the FY2008 Planning Document, provided during the course of OIG's review, does document this particular change in procedure.

**Recommendation 6: The Division of Trading and Markets should establish a procedure to ensure that its staff process and disseminate the 17(h) filings in a defined period of time, which ensures that the information in the filings is current and relevant when the filings are processed.**

The Division concurs.

**Recommendation 7: Within three months after the issuance of this report, the Division of Trading and Markets should develop and maintain a current list, with supporting documentation, which identified all of the broker-dealers that are exempt from filing Form 17-H. The Division of Trading and Markets should continuously update this list as new firms are exempted from filing Form 17-H.**

The Division concurs.

**Recommendation 8: The Division of Trading and Markets should aggressively encourage firms to file electronically using the BDRA system. The Division of Trading and Markets should especially encourage the firms that it reviews to file electronically. This could be accomplished by calling the firms and periodically sending the firms information on how to file electronically.**

The Division concurs that electronic filing should be encouraged. However, the staff notes that it has called firms, sent e-mail to firms, and otherwise encouraged what would be a voluntary migration to electronic filing. Such outreach was undertaken with more than 60 firms filing Form 17-H. Despite concerted efforts by the Office of Information Technology ("OIT"), technical issues involving the BDRA system have remained a significant obstacle to the success of these initiatives in migrating substantial numbers of

firms to the BDRA system. The staff is hopeful that the continued cooperation with OIT on the technical issues, combined with a mandatory electronic filing requirement in a revised rule, will succeed in eliminating non-electronic filing of Form 17-H.

**Recommendation 9: In coordination with the Office of Information Technology, the Division of Trading and Markets should ensure that the BDRA system includes financial information, staff notes and other written documentation about the firms TM reviews and that BDRA is used to generate management reports.**

The Division concurs, recognizing however that rule revisions could substantially alter the population of filers as well as the information filed. Thus it is important to design and implement any enhancement to the BDRA system in conjunction with rule revisions.

## Management Comments (OIT)

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### Memorandum

To: Jacqueline M. Wilson  
Assistant Inspector General for Audits

From: Lewis W. Walker  
Chief Information Officer (Acting)

Subject: Responses to Formal Draft Report, SEC Risk Assessment Program,  
Report No. 446-B

Date: September 11, 2008

Thank you for the opportunity to respond to the above captioned report. OIT is responding only to those two recommendations for which it is assigned some responsibility for action.

**Recommendation 9:** In coordination with the Office of Information Technology, the Division of Trading and Markets should ensure that the BDRA system includes financial information, staff notes and other written documentation about the firms TM reviews and that BDRA is used to generate management reports.

#### Management Response and comments:

Although OIT does not object to this recommendation, it notes that decisions about the functionality of the BDRA system, what data it contains, and how the system is used reside solely with TM. To the extent that TM determines to implement any portions of this recommendation, OIT will provide support to the extent it is consistent with the agency's enterprise architecture and other agency priorities for IT resources and funding.

With respect to current efforts to assist TM with respect to the suggested enhancements to the BDRA application:

- OIT staff has discussed with the users adding financial information to the report generation function. After the next release of Business Objects XI is implemented (currently estimated as December 2008), OIT's Walk-in Development Center can help the user create financial reports.
- Within the current release, there is a "Staff Notes" tab for each filing that is meant to be used for the user's notes. Storing TM's staff documentation

using the BDRA application is a requirement that possibly could be fulfilled in a future release (there is already a tab labeled "Attachments" that could provide the ability to store these documents). However, OIT will consider all options for best satisfying TM's document management requirements when it is approached to architect the solution.

**Recommendation 10:** The Office of Information Technology, in coordination with the Division of Trading and Markets should ensure that technical problems with the BDRA system are resolved so that:

- All filings in the BDRA system can be properly and fully accessed;
- A digital signature accompanies all required filings;
- All filings, including those that are greater than and less than 16 megabytes, can be completely and accurately uploaded into BDRA in one submission; and
- Access to the BDRA system is consistently available to users and TM should promptly notify all users when it is unavailable.

**Management Response and comments:**

Release 1.7 to the BDRA application was successfully deployed on September 5, 2008 and addressed almost all of recommendation 10 as noted in the following list of system changes:

1) **Access to All Filing Information** - The BDRA Form Parser was modified so that the submission will include all attachments. This change resolves the problem of having only parts of a filing appear in the BDRA system.

2) **Digital Signatures** – The capability for digital signatures existed in BDRA. In the new version, a digital signature will be required when the radio button for Digital Signature is selected on the Form 17H. However, the decision to require that a digital signature accompany all filings is a business decision that must be made by TM.

3) **Size Limit Notification** - The system no longer accepts filings that are greater than 16MB. It will stop large submissions from being accepted and tell the user why the submission is not being accepted. This size limitation is necessary at this time due to the configuration of the underlying database. OIT plans is to upgrade the database to the latest version of the MYSQL database by no later than March 31, 2009 which will eliminate the need to impose size limits for filings.

4) **Notification for All System Downtime** - In the future, the OIT Project team will ensure that all users are notified prior to any system downtime or future maintenance releases.

## Appendix VI

In view of the above, OIT requests that recommendation 10 be revised to remove all recommendations except that BDRA be able to accept filings greater than 16 megabytes. If the recommendation for digital signatures is retained, responsibility for its implementation should be assigned to TM.

Cc: Srinu Bangarbale  
George Eckard  
Remi Pavlik-Simon  
Jeff Thomas



## OIG Response to Management's Comments

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The Division of Trading and Markets (TM) and the Office of Information Technology (OIT) responded to this report. TM concurred with 9 out of 10 of the report's recommendations and OIT concurred with the two recommendations that were addressed to their office.

We are pleased with the willingness on the part of the Commission to implement the report's recommendations. However, we are disappointed that TM disagrees with recommendation no. 3, which states that TM should remind broker-dealers subject to the 17(h) Risk Assessment Program of their obligation to retain the information specified in Rule 17h-1T and take appropriate steps to determine if the firms retain this information in accordance with Rule 17h-1T. We believe that enforcing the rule's requirements is prudent and we request that TM reconsider its position and remind broker-dealers of the requirement to preserve information, as stated in recommendation 3. In addition, although not specifically mentioned in the report, we also believe that TM should remind the broker-dealers of their requirement to file Form 17-H. The OIG found that approximately one-third of the firms required to file this form, failed to do so.

## Audit Request and Ideas

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The Office of Inspector General welcomes your input. If you would like to request an audit in the future or have an audit idea, please contact us at:

U.S. Securities and Exchange Commission  
Office of Inspector General  
Attn: Assistant Inspector General, Audits (Audit Request/Idea)  
100 F Street, N.E.  
Washington D.C. 20549-2736

Tel. #: 202-551-6061  
Fax #: 202-772-9265

Email: [oig@sec.gov](mailto:oig@sec.gov)

### Hotline

To report fraud, waste, abuse, and mismanagement at SEC,  
contact the Office of Inspector General at:

Phone: 877.442.0854

Web-Based Hotline Complaint Form:  
[www.reportlineweb.com/sec\\_oig](http://www.reportlineweb.com/sec_oig)



U.S. Securities and Exchange Commission

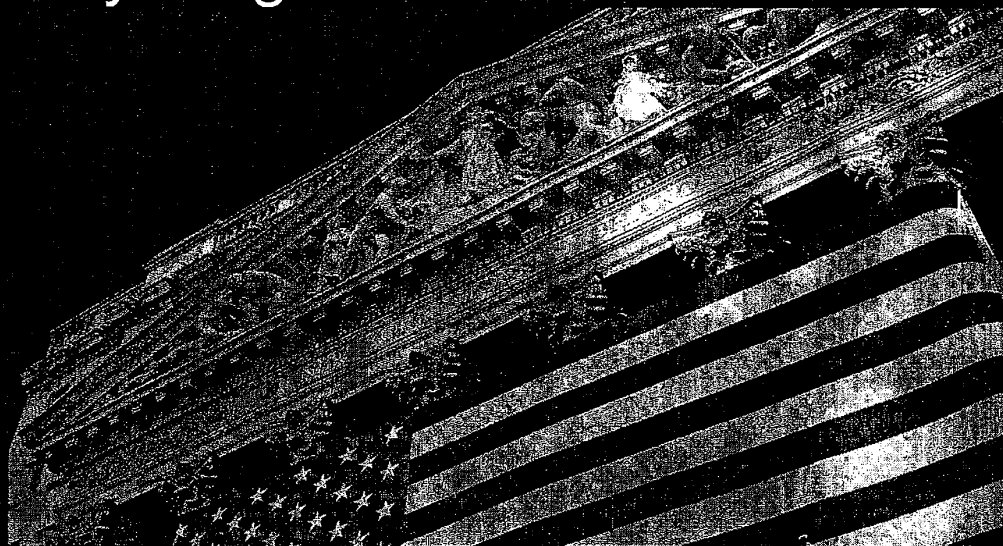
Office of Inspector General

Office of Audits

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# SEC's Oversight of Bear Stearns and Related Entities:

## The Consolidated Supervised Entity Program



September 25, 2008  
Report No. 446-A

The SEC believes this report contains  
non-public and confidential  
Information




OFFICE OF  
INSPECTOR GENERAL

UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549

September 25, 2008

**To:** Chairman Christopher Cox  
Erik Sirri, Director, Division of Trading and Markets  
Lori Richards, Director, Office of Compliance Inspections and  
Examinations  
John White, Director, Division of Corporation Finance  
Jonathan Sokobin, Director, Office of Risk Assessment

**From:** H. David Kotz, Inspector General 

**Subject:** *Audit of SEC's Oversight of Bear Stearns and Related Entities: The Consolidated Supervised Entity Program, Report No. 446-A*

This memorandum transmits the Securities and Exchange Commission, Office of Inspector General's (OIG) final report detailing the results of our audit on the SEC's Oversight of Bear Stearns and Related Entities: The Consolidated Supervised Entity Program. This audit was conducted pursuant to a Congressional request from Ranking Member Charles E. Grassley of the United States Senate Committee on Finance.

The final report consists of 26 recommendations that are addressed primarily to the Division of Trading and Markets (TM). Recommendations 18 and 25 are also addressed to the Office of Compliance Inspections and Examinations (OCIE) and Recommendation 19 is also addressed to the Office of Risk Assessment (ORA). Recommendations 20 and 21 are addressed to the Division of Corporation Finance (CF), Recommendation 17 is addressed to CF and TM, and Recommendation 22 is addressed to Chairman Cox.

In response to the draft report, responsible management officials agreed with 21 out of 26 recommendations. TM concurred with 20 of 23 recommendations addressed to them and disagreed with Recommendations 13, 15, and 16. OCIE concurred with both recommendations addressed to them. CF concurred with Recommendation 17, but disagreed with Recommendations 20 and 21.

Your written responses to the draft report, dated September 18, 2008, are included in their entirety in Appendices VI and VII. In addition, OIG's response to Chairman Cox's and Management's comments are included in Appendix VIII.

Should you have any questions regarding this report, please do not hesitate to contact me. During this audit we appreciate the courtesy and cooperation that you and your staff extended to our auditors.

Attachment

cc: Peter Uhlmann, Chief of Staff, Chairman's Office  
Diego Ruiz, Executive Director, Office of the Executive Director  
Brian Cartwright, General Counsel, Office of General Counsel  
Andrew Donohue, Director, Division of Investment Management  
John Nester, Director Office of Public Affairs  
William Schulz, Office of Legislative and Intergovernmental Affairs  
Bob Colby, Deputy Director, TM  
Daniel Gallagher, Deputy Director, TM  
Shelley Parratt, Deputy Director, CF  
Michael Macchiaroli, Associate Director, TM  
Mary Ann Gadziala, Associate Director, OCIE  
Matthew Eichner, Assistant Director, TM  
John Walsh, Chief Counsel, OCIE  
Thomas K. McGowan, Assistant Director, TM  
Herb Brooks, Assistant Director, TM  
William Lenox, Ethics Counsel, Office of General Counsel  
Denise Landers, Legal Counsel, TM  
Juanita Bishop Hamlett, Branch Chief, OCIE  
Darlene L. Pryor, Management Analyst, Office of the Executive Director  
  
Rick Hillman, Managing Director of Financial Markets and Community  
Investment, GAO

# The CSE Program (Including Reviews Performed on Bear Stearns)

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## Executive Summary

**Background.** During the week of March 10, 2008, rumors spread about liquidity problems at The Bear Stearns Companies, Inc. (Bear Stearns).<sup>1</sup> As the rumors spread, Bear Stearns was unable to obtain secured financing from counterparties. This caused severe liquidity problems. As a result, on Friday March 14, 2008, JP Morgan Chase & Co. (JP Morgan) provided Bear Stearns with emergency funding from the Federal Reserve Bank of New York (FRBNY).<sup>2</sup> According to Congressional testimony,<sup>3</sup> after the markets closed on March 14, 2008, it became apparent that the FRBNY's funding could not stop Bear Stearns' downward spiral. As a result, Bear Stearns concluded that it would need to file for bankruptcy protection on March 17, 2008, unless another firm purchased it. On Sunday March 16, 2008, (before the Asian markets opened), Bear Stearns' sale to JP Morgan was announced with financing support from the FRBNY. In May 2008, the sale was completed.

Because Bear Stearns had collapsed, at the time of our fieldwork, there were six holding companies in the Securities and Exchange Commission's (Commission) Consolidated Supervised Entity (CSE) program. In addition to Bear Stearns, these six holding companies include or included Goldman Sachs Group, Inc. (Goldman Sachs), Morgan Stanley, Merrill Lynch & Co. (Merrill Lynch), Lehman Brothers Holdings Inc. (Lehman Brothers), Citigroup Inc. and JP Morgan. On September 15, 2008, Lehman Brothers announced that it would file for bankruptcy protection and Bank of America announced that it agreed to acquire Merrill Lynch.<sup>4</sup> Both firms had experienced serious financial difficulties. Finally, on September 21, 2008, the Board of Governors of the Federal Reserve System (Federal Reserve) approved, pending a statutory five-day antitrust waiting period, applications from Goldman Sachs and Morgan Stanley to become bank holding companies with the Federal Reserve as their new principal regulator. As a result, the future of the CSE program is uncertain.

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<sup>1</sup> See Acronyms used in Appendix I.

<sup>2</sup> The funding was from the Federal Reserve Bank of New York (FRBNY) through JP Morgan Chase & Co. (JP Morgan) to The Bear Stearns Companies, Inc. (Bear Stearns) because JP Morgan, unlike Bear Stearns, could borrow money from the FRBNY.

<sup>3</sup> Timothy Geithner (President and Chief Executive Officer, FRBNY) and Alan Schwartz (President and Chief Executive Officer of Bear Stearns) before U.S. Senate Committee on Banking, Housing and Urban Affairs on Turmoil in U.S. Credit Markets: Examining the Recent Actions of Federal Financial Regulators dated April 3, 2008.

<sup>4</sup> The audit fieldwork was completed prior to these events on September 15, 2008.

Of the seven original CSE firms, the Commission exercised direct oversight over only five firms (Bear Stearns, Goldman Sachs, Morgan Stanley, Merrill Lynch, and Lehman Brothers), which did not have a principal regulator. The Commission does not directly oversee Citigroup Inc. and JP Morgan because these firms have a principal regulator, the Federal Reserve.

The CSE program is a voluntary program that was created in 2004 by the Commission pursuant to rule amendments under the Securities Exchange Act of 1934.<sup>5</sup> This program allows the Commission to supervise these broker-dealer holding companies on a consolidated basis. In this capacity, Commission supervision extends beyond the registered broker-dealer to the unregulated affiliates of the broker-dealer to the holding company itself. The CSE program was designed to allow the Commission to monitor for financial or operational weakness in a CSE holding company or its unregulated affiliates that might place United States regulated broker-dealers and other regulated entities at risk.

A broker-dealer becomes a CSE by applying to the Commission for an exemption from computing capital using the Commission's standard net capital rule, and the broker-dealer's ultimate holding company consenting to group-wide Commission supervision (if it does not already have a principal regulator). By obtaining an exemption from the standard net capital rule, the CSE firms' broker-dealers are permitted to compute net capital using an alternative method. The Commission designed the CSE program to be broadly consistent with the Federal Reserve's oversight of bank holding companies.

Bear Stearns' main activities were investment banking, securities and derivatives sales and trading, clearance, brokerage and asset management. Bear Stearns was highly leveraged with a large exposure (*i.e.*, concentration of assets) in mortgage-backed securities. Bear Stearns had less capital and was less diversified than several of the other CSE firms.

The Commission stated that Bear Stearns' unprecedented collapse was due to a liquidity crisis caused by a lack of confidence. Chairman Christopher Cox described Bear Stearns as a well-capitalized and apparently fully liquid major investment bank that experienced a crisis of confidence, denying it not only unsecured financing, but short-term secured financing, even when the collateral consisted of agency securities with a market value in excess of the funds to be borrowed.<sup>6</sup>

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<sup>5</sup> Source: Final Rule: Alternative Net Capital Requirements for Broker-Dealers That Are Part of Consolidated Supervised Entities (69 Fed Reg. 34.428). Securities and Exchange Commission (Commission). 21 June 2004.  
<<http://www.sec.gov/rules/final/34-49830.htm>>.

<sup>6</sup> Source: *Turmoil in U.S. Credit Markets: Examining the Recent Actions of Federal Financial Regulators Before United States (U.S.) Senate Committee on Banking, Housing and Urban Affairs, 110<sup>th</sup> Cong.* (April 3, 2008) (statement of Christopher Cox, Chairman, Commission).

**Congressional Request.** On April 2, 2008, the Office of Inspector General (OIG) received a letter from Ranking Member Charles E. Grassley of the United States Senate Committee on Finance, requesting that the OIG analyze the Commission's oversight of CSE firms and broker-dealers subject to the Commission's Risk Assessment Program.<sup>7</sup> This letter noted that the Commission's Division of Trading and Markets (TM) was responsible for regulating the largest broker-dealers, and their associated holding companies. The letter requested a review of TM's oversight of the five CSE firms it directly oversees, with a special emphasis on Bear Stearns. The letter requested that the OIG analyze how the CSE program is run, the adequacy of the Commission's monitoring of Bear Stearns, and make recommendations to improve the Commission's CSE program.

The United States Senate Committee on Finance letter also requested that the OIG provide an update of findings made in its previous audit report on the Commission's Broker-Dealer Risk Assessment Program (*Broker-Dealer Risk Assessment Program*, Report no. 354, issued on August 13, 2002).<sup>8</sup>

**Audit Objectives.** In response to the April 2, 2008 Congressional Request, the OIG conducted two separate audits with regard to the Commission's oversight of Bear Stearns and related entities. This audit's objectives were to evaluate the Commission's CSE program, emphasizing the Commission's oversight of Bear Stearns and to determine whether improvements are needed in the Commission's monitoring of CSE firms and its administration of the CSE program.

The OIG performed a second audit on the Commission's Broker-Dealer Risk Assessment Program to follow up on the current status of recommendations made in the OIG's prior audit report of the Risk Assessment Program (*Broker-Dealer Risk Assessment Program*, Report no. 354, issued on August 13, 2002) and to examine the Broker-Dealer Risk Assessment program to determine whether improvements are needed. The Commission's Risk-Assessment program tracks the filing status of 146 broker-dealers that are part of a holding company structure and have at least \$20 million in capital. The Risk Assessment Program report found that TM is not fulfilling its obligations in accordance with the underlying purpose of the Broker-Dealer Risk Assessment program in several respects. TM has failed to update and finalize the rules governing the program, TM has not enforced the filing requirement incumbent on broker-dealers, resulting in the failure of nearly one-third of the required firms to file 17(h) documents, TM has not yet determined whether the two remaining Bear Stearns' broker-dealers are obligated to file Form 17-H, and TM only

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<sup>7</sup> A copy of this request letter is attached to this report in full in Appendix II.

<sup>8</sup> The U.S. Senate Committee on Finance letter also requested that the Office of Inspector General (OIG) conduct an investigation into the facts and circumstances surrounding the Commission's decision not to pursue an Enforcement Action against Bear Stearns. This issue will be addressed in an OIG investigative report to be issued on September 30, 2008.



conducts an in-depth review of the filings for six of the 146 filing firms that TM determined are most significant, based on their free credit balances and customer accounts. Audit report number 446-B examining the Commission's Risk Assessment program contains 10 recommendations and was issued on September 25, 2008.

**Retention of an Expert.** Given the complexity of the subject matter, the OIG retained an expert, Albert S. (Pete) Kyle to provide assistance with this audit. Professor Kyle joined the University of Maryland faculty as the Charles E. Smith Chair Professor of Finance at the Robert H. Smith School of Business in August 2006. He earned a Bachelor of Science degree in Mathematics from Davidson College in 1974, studied Philosophy and Economics at Oxford University as a Rhodes Scholar and completed his Ph.D. in Economics at the University of Chicago in 1981. He was a professor at Princeton University's Woodrow Wilson School from 1981-1987, at the University of California's Haas Business School in Berkeley from 1987-1992, and at Duke University from 1992-2006.

Professor Kyle is a renowned expert on many aspects of capital markets, with a particular focus on market microstructure. He has conducted significant research on such topics as informed speculative trading, market manipulation, price volatility, and the information content of market prices, market liquidity, and contagion. His paper "Continuous Auctions and Insider Trading" (*Econometrica*, 2005) is one of the mostly highly cited papers in theoretical asset pricing.

Professor Kyle was elected a Fellow of the Econometric Society in 2002. He was also a board member of the American Finance Association from 2004-2006. He served as a staff member of the Presidential Task Force on Market Mechanisms (Brady Commission), after the stock market crash of 1987. During his career, he has worked as a consultant on finance topics for several government agencies, in addition to the Commission, including the Department of Justice, the Internal Revenue Service, the Federal Reserve and the Commodity Futures Trading Commission.

Professor Kyle's Curriculum Vitae appears in Appendix III of this report.

In this audit, Professor Kyle analyzed TM's oversight of the CSE firms, with a particular focus on Bear Stearns. Professor Kyle reviewed TM's internal memoranda on the CSE firms, which documented TM's assessment of the CSE firms' operations and reviewed data in the CSE firms' monthly and quarterly CSE program filings.

From this information, Professor Kyle analyzed the firms' financial data, holdings, risk management strategies, tolerance for risk and assessed the adequacy of the firms' filings. In particular, Professor Kyle analyzed Bear Stearns' capital, liquidity, and leverage ratios, access to secured and unsecured financing, and its

compliance with industry and worldwide standards such as the Basel Standards.<sup>9</sup> Professor Kyle analyzed how TM supervised or oversaw Bear Stearns' mortgage-backed securities portfolio, its use of models to measure risk, the adequacy of its models, its model review process, the relationship between its traders and risk management department, and its risk-management scenarios. Professor Kyle also examined how TM supervised Bear Stearns' internal operations, including its funding of two prominent hedge funds that collapsed in the summer of 2007.

**Audit Conclusions and Results.** The CSE program's mission (goal) provides in pertinent part as follows:

The regime is intended to allow the Commission to monitor for, and act quickly in response to, financial or operational weakness in a CSE holding company or its unregulated affiliates that might place regulated entities, including US and foreign-registered banks and broker-dealers, *or the broader financial system at risk.*<sup>10</sup> [Emphasis added]

Thus, it is undisputable that the CSE program failed to carry out its mission in its oversight of Bear Stearns because under the Commission and the CSE program's watch, Bear Stearns suffered significant financial weaknesses and the FRBNY needed to intervene during the week of March 10, 2008, to prevent significant harm to the broader financial system.<sup>11</sup>

This audit was not intended to be a complete assessment of the multitude of events that led to Bear Stearns' collapse, and accordingly, does not purport to demonstrate any specific or direct connection between the failure of the CSE Program's oversight of Bear Stearns and Bear Stearns' collapse. However, we have identified serious deficiencies in the CSE program that warrant improvements. Overall, we found that there are significant questions about the adequacy of a number of CSE program requirements, as Bear Stearns was compliant with several of these requirements, but nonetheless collapsed. In

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<sup>9</sup> "The Basel Committee on Banking Supervision (Basel Committee) seeks to improve the quality of banking supervision worldwide, in part by developing broad supervisory standards. The Basel Committee consists of central bank and regulatory officials from 13 member countries: Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, the Netherlands, Spain, Sweden, Switzerland, United Kingdom, and United States. The Basel Committee's supervisory standards are also often adopted by nonmember countries." Source: Government Accountability Office. Bank Regulators Need to Improve Transparency and Overcome Impediments to Finalizing the Proposed Basel II Framework. Report No. 07-253, February 15, 2007.

<sup>10</sup> Source: SEC [Commission] Consolidated Supervision of Broker-Dealer Holding Companies Program Overview and Assessment Criteria. Commission. 16 Mar 2007. <<http://www.sec.gov/divisions/marketreg/cseoverview.htm>>.

<sup>11</sup> The Commission established criteria (the link is provided below) for measuring the success of the Consolidated Supervised Entity (CSE) program. While the CSE program may have been successful in achieving its established criteria, none of the criteria standards directly related to the failure of a CSE firm and its effect on the broader financial system (as stated in the CSE program's goal statement). Source: SEC [Commission] Consolidated Supervision of Broker-Dealer Holding Companies Program Overview and Assessment Criteria. Commission. 16 Mar 2007.

addition, the audit found that TM became aware of numerous potential red flags prior to Bear Stearns' collapse, regarding its concentration of mortgage securities, high leverage, shortcomings of risk management in mortgage-backed securities and lack of compliance with the spirit of certain Basel II standards, but did not take actions to limit these risk factors.

In addition, the audit found that procedures and processes were not strictly adhered to, as for example, the Commission issued an order approving Bear Stearns to become a CSE prior to the completion of the inspection process. Further, the Division of Corporation Finance (CF) did not conduct Bear Stearns' most recent 10-K filing review in a timely manner.

The audit also identified numerous specific concerns with the Commission's oversight of the CSE program, some of which are summarized as follows:<sup>12</sup>

- (a) Bear Stearns was compliant with the CSE program's capital and liquidity requirements;<sup>13</sup> however, its collapse raises questions about the adequacy of these requirements;
- (b) Although TM was aware, prior to Bear Stearns becoming a CSE firm, that Bear Stearns' concentration of mortgage securities was increasing for several years and was beyond its internal limits, and that a portion of Bear Stearns' mortgage securities (e.g., adjustable rate mortgages) represented a significant concentration of market risk, TM did not make any efforts to limit Bear Stearns' mortgage securities concentration;
- (c) Prior to the adoption of the rule amendments which created the CSE program, the broker-dealers affiliated with the CSE firms were required to either maintain:
  - A debt to-net capital ratio of less than 15 to 1 (after their first year of operation); or
  - Have net capital not less than the greater of \$250,000 or two percent of aggregate debit items computed in accordance with the *Formula for Determination of Reserve Requirements for Broker-Dealers*.

However, the CSE program did not require a leverage ratio limit for the CSE firms. Furthermore, despite TM being aware that Bear Stearns' leverage was high, TM made no efforts to require Bear Stearns to reduce its leverage, despite some authoritative sources describing a linkage between leverage and liquidity risk;

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<sup>12</sup> We have no specific evidence indicating whether any of these issues directly contributed to Bear Stearns' collapse since our audit scope did not include a determination of the cause of Bear Stearns' collapse (see Appendix IV).

<sup>13</sup> As discussed in the Scope and Methodology section (see Appendix IV), we did not independently verify (i.e., recalculate and determine the accuracy) Bear Stearns' capital or liquidity amounts.

- (d) TM became aware that risk management of mortgages at Bear Stearns had numerous shortcomings, including lack of expertise by risk managers in mortgage-backed securities at various times; lack of timely formal review of mortgage models; persistent understaffing; a proximity of risk managers to traders suggesting a lack of independence; turnover of key personnel during times of crisis; and the inability or unwillingness to update models to reflect changing circumstances. Notwithstanding this knowledge, TM missed opportunities to push Bear Stearns aggressively to address these identified concerns;
- (e) There was no documentation of discussions between TM and Bear Stearns of scenarios involving a meltdown of mortgage market liquidity, accompanied by a fundamental deterioration of the mortgages themselves. TM appeared to identify the types of risks associated with these mortgages that evolved into the subprime mortgage crisis yet did not require Bear Stearns to reduce its exposure to subprime loans;
- (f) Bear Stearns was not compliant with the spirit of certain Basel II standards and we did not find sufficient evidence that TM required Bear Stearns to comply with these standards;
- (g) TM took no actions to assess Bear Stearns' Board of Directors' and senior officials' (e.g., the Chief Executive Officer) tolerance for risk although we found that this is a prudent and necessary oversight procedure;
- (h) TM authorized (without an appropriate delegation of authority) the CSE firms' internal audit staff to perform critical audit work involving the risk management systems instead of the firms' external auditors as required by the rule that created the CSE program;
- (i) In June 2007, two of Bear Stearns' managed hedge funds collapsed. Subsequent to this collapse, significant questions were raised about some of Bear Stearns' senior managements' lack of involvement in handling the crisis. However, TM did not reassess the communication strategy component of Bear Stearns' Contingency Funding Plan (CFP) after the collapse of the hedge funds, and very significant questions were once again raised about some of Bear Stearns' managements' handling of the crisis during the week of March 10, 2008;
- (j) The Commission issued four of the five Orders approving firms to use the alternative capital method, and thus become CSEs (including Bear Stearns) before the inspection process was completed; and
- (k) CF did not conduct Bear Stearns' most recent 10-K filing review in a timely manner. The effect of this untimely review was that CF deprived investors of material information that they could have

used to make well-informed investment decisions (*i.e.*, whether to buy/sell Bear Stearns' securities). In addition, the information (*e.g.*, Bear Stearns' exposure to subprime mortgages) could have been potentially beneficial to dispel the rumors that led to Bear Stearns' collapse.

**Recommendations.** We identified 26 recommendations (see Appendix V) that should significantly improve the Commission's oversight of CSE firms. Chairman Cox's and Management's comments are attached in Appendix VI and VII, respectively. Our recommendations include:

- (a) A reassessment of guidelines and rules regarding the CSE firms' capital and liquidity levels;
- (b) Taking appropriate measures to ensure that TM adequately incorporates a firm's concentration of securities into the CSE program's assessment of a firm's risk management systems and more aggressively prompts CSE firms to take appropriate actions to mitigate such risks;
- (c) A reassessment of the CSE program's policy regarding leverage ratio limits;
- (d) Ensuring that: (1) the CSE firms have specific criteria for reviewing and approving models used for pricing and risk management, (2) the review and approval process conducted by the CSE firms is performed in an independent manner by the CSEs' risk management staff, (3) each CSE firm's model review and approval process takes place in a thorough and timely manner, and (4) limits are imposed on risk taking by firms in areas where TM determines that risk management is not adequate;
- (e) Being more skeptical of CSE firms' risk models and working with regulated firms to help them develop additional stress scenarios that have not already been contemplated as part of the prudential regulation process;
- (f) Greater involvement on the part of TM in formulating action plans for a variety of stress or disaster scenarios, even if the plans are informal;
- (g) Taking steps to ensure that mark disputes do not provide an occasion for CSE firms to inflate the combined capital of two firms by using inconsistent marks;
- (h) Encouraging the CSE firms to present Value at Risk and other risk management data in a useful manner, which is consistent with how the CSE firms use the information internally and allows risk factors to be applied consistently to individual desks;
- (i) Ensuring (in accordance with Basel II) that the Consolidated Supervised Entities take appropriate capital deductions for illiquid

assets and appropriate capital deductions for stressed repos, especially stressed repos where illiquid securities are posted as collateral;

- (j) Greater discussion of risk tolerance with the CSE firms' Boards of Directors and senior management to better understand whether the actions of CSE firms' staff are consistent with the desires of the Boards of Directors and senior management;
- (k) Requiring compliance with the existing rule that requires external auditors to review the CSE firms' risk management control systems or seek Commission approval in accordance with the Administrative Procedures Act for this deviation from the current rule's requirement;
- (l) Ensuring that reviews of a firm's CFP includes an assessment of a CSE firm's internal and external communication strategies;
- (m) Developing a formal automated process to track material issues identified by the monitoring staff to ensure they are adequately resolved;
- (n) Ensuring that they complete all phases of a firm's inspection process before recommending that the Commission allow any additional CSE firms the authority to use the alternative capital method;
- (o) Improving collaboration efforts among TM, CF, the Office of Compliance Inspections and Examination (OCIE), and the Office of Risk Assessment (ORA);
- (p) The development by CF of internal guidelines for reviewing filings timely and tracking and monitoring compliance with its internal guidelines; and
- (q) The creation of a Task Force led by ORA with staff from TM, the Division of Investment Management, and OCIE to perform an analysis of large firms with customer accounts that hold significant amounts of customer funds and have unregulated entities, to determine the costs and benefits of supervising these firms on a consolidated basis.

The final report consists of 26 recommendations that are addressed primarily to the Division of Trading and Markets (TM). Recommendations 18 and 25 are also addressed to the Office of Compliance Inspections and Examinations (OCIE) and Recommendation 19 is also addressed to the Office of Risk Assessment (ORA). Recommendations 20 and 21 are addressed to the Division of Corporation Finance (CF), Recommendation 17 is addressed to CF and TM, and Recommendation 22 is addressed to Chairman Cox.

In response to the draft report, responsible management officials agreed with 21 out of 26 recommendations. TM concurred with 20 of 23 recommendations

addressed to them and disagreed with Recommendations 13, 15, and 16. OCIE concurred with both recommendations addressed to them. CF concurred with Recommendation 17, but disagreed with Recommendations 20 and 21.

# TABLE OF CONTENTS

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Executive Summary .....	iv
Table of Contents .....	xiv
Background and Objectives .....	1
Findings and Recommendations .....	10
Finding 1: Bear Stearns Was Compliant With The CSE Program's Capital Ratio And Liquidity Requirements, But The Collapse Of Bear Stearns Raises Questions About The Adequacy Of These Requirements .....	10
Capital .....	10
Adequacy of Capital Levels .....	10
Increased Access to Secured Financing .....	11
Recommendation 1 .....	13
Liquidity .....	14
Recommendation 2 .....	17
Finding 2: TM Did Not Adequately Address Several Significant Risks That Impact The Overall Effectiveness Of The CSE Program .....	17
Concentration of Assets .....	17
Recommendation 3 .....	18
Leverage .....	19
Recommendation 4 .....	20
Bear Stearns Model Review Process and Risk Management Staffing Were Inadequate In The Area Of Mortgage Backed Securities .....	20
Recommendation 5 .....	24
Risk Scenarios .....	24
Recommendation 6 .....	27
Recommendation 7 .....	27
Non-compliance With Basel II .....	27
Mark Disputes .....	27
Recommendation 8 .....	29
Inconsistent VaR Numbers .....	29
Recommendation 9 .....	29



Bear Stearns' Capital Requirements for Illiquid Assets and Stressed Repos Require Careful Oversight .....	29
Recommendation 10.....	33
Tolerance for Risk .....	33
Recommendation 11.....	33
Finding 3: TM, Without Explicit Authority, Allowed The CSE Firms' Internal Auditors To Perform Critical Work.....	34
Recommendation 12.....	35
Finding 4: TM Did Not Review The Communication Strategy Component Of Bear Stearns' Contingency Funding Plan After The Collapse Of Two Of Its Managed Hedge Funds .....	35
Recommendation 13 .....	36
Finding 5: TM's Monitoring Staff Do Not Adequately Track Material Issues .....	37
Develop a Formal Automated Tracking Process.....	37
Recommendation 14 .....	38
Follow-up on Prior OCIE Findings.....	38
Recommendation 15 .....	40
Finding 6: The Commission's Orders Allowing Firms (Including Bear Stearns) To Use The Alternative Capital Method Were Generally Approved Before The Inspection Process Was Completed .....	40
Recommendation 16 .....	41
Finding 7: Collaboration Between TM and Other Commission Divisions/Offices Should Be Significantly Improved.....	41
Collaboration with CF .....	41
Recommendation 17 .....	42
Collaboration with OCIE.....	42
Recommendation 18 .....	43
Collaboration with ORA.....	43
Recommendation 19 .....	43
Finding 8: CF's Filing Review Of Bear Stearns' 2006 10-K Was Not Timely.....	44
Review of Bear Stearns' 10-K Filing.....	44
Recommendation 20 .....	45

Bear Stearns' Response to CF's Comment Letter.....	45
Recommendation 21 .....	46
Finding 9: Certain Firms May Pose A Systemic Risk Because They Are Not Supervised On A Consolidated Basis.....	46
Recommendation 22 .....	47
Finding 10: TM Should Address Organizational Issues Involving The Future Of The CSE Program .....	48
Changes to the CSE Program.....	48
Recommendation 23 .....	49
Program Staffing.....	49
Recommendation 24 .....	50
Ethics Manual .....	50
Recommendation 25 .....	50
Coordination with Other Regulators.....	50
Recommendation 26 .....	51
Appendices	
Appendix I: Acronyms.....	52
Appendix II: Congressional Audit Request.....	54
Appendix III: Curriculum Vitae (OIG expert: Albert "Pete" Kyle).....	56
Appendix IV: Scope and Methodology .....	70
Appendix V: List of Recommendations .....	76
Appendix VI: Chairman Cox's Comments .....	81
Appendix VII: Management Comments .....	83
Appendix VIII: OIG Response to Chairman Cox & Management Comments.....	116
Appendix IX: Gross Leverage Ratios .....	120
Appendix X: Criteria .....	121

# Background and Objectives

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## Background

**General Background Information.** The Division of Trading and Markets (TM)<sup>14</sup> is responsible for regulating broker-dealers, which includes administering the Consolidated Supervised Entity (CSE) and Broker-Dealer Risk Assessment programs. The Office of Compliance Inspections and Examinations (OCIE) has responsibility within the Securities and Exchange Commission (Commission) for conducting the inspections<sup>15</sup> of broker-dealers, including broker-dealers that are affiliated with CSE firms<sup>16</sup> (*i.e.*, investment banks).<sup>17</sup> The following TM offices are directly involved in these programs:

- **Office of Financial Responsibility:** This office is responsible for administering the financial responsibility regulations (*e.g.*, net capital rule)<sup>18</sup>

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<sup>14</sup> See Acronyms used in Appendix I.

<sup>15</sup> The Division of Trading and Markets (TM) uses the term "inspections", however, the Office of Compliance Inspections and Examinations (OCIE) uses the term "examinations". For purposes of this audit report, we use the term "inspections" to refer to both. In addition, for purposes of this audit report, OCIE also includes the Inspection staff in the Commission's regional offices.

<sup>16</sup> During our audit fieldwork, there were four Consolidated Supervised Entity (CSE) firms whose principal regulator (as discussed below) was the Commission: Goldman Sachs Group, Inc., Lehman Brothers Holdings Inc. (Lehman Brothers), Merrill Lynch & Co., Inc., and Morgan Stanley. On September 15, 2008, Lehman Brothers announced that it would file for bankruptcy protection and Bank of America announced that it agreed to acquire Merrill Lynch & Co., Inc. On September 21, 2008, the Federal Reserve approved, pending a statutory five-day antitrust waiting period, applications from Goldman Sachs and Morgan Stanley to become bank holding companies. The Bear Stearns Companies, Inc. (Bear Stearns) was also a CSE firm (approved in November 2005) until its collapse. In addition, JP Morgan Chase & Co. (JP Morgan) and Citigroup Inc. have been approved to use the alternative method for their broker-dealer capital requirements, but the Board of Governors of the Federal Reserve System (Federal Reserve) is their principal regulator (*i.e.*, is responsible for the consolidated entity) but the Commission is responsible for the oversight of their broker-dealers. As a result, the Securities and Exchange Commission (Commission) defers oversight (of the consolidated entity) of JP Morgan and Citigroup to the Federal Reserve to avoid duplicative or inconsistent regulation.

<sup>17</sup> In 2007, in response to a Government Accountability Office (GAO) report Financial Market Regulation: Agencies Engaged in Consolidated Supervision Can Strengthen Performance Measurement and Collaboration, Report 07-154, March 15, 2007 (as discussed in the Prior Audit Coverage section of the Scope and Methodology - see Appendix III); the Chairman (in consultation with the other Commissioners) decided to transfer the responsibility for conducting inspections of the consolidated entities from OCIE to TM. The timing of the actual transfer is discussed in more detail later in this report. OCIE retained (within the Commission) responsibility for conducting inspections of the CSEs' broker-dealers. The Self Regulatory Organizations (SRO) have the primary inspection responsibility for the registered broker-dealers. OCIE has oversight responsibility of these broker-dealers and conducts periodic inspections. The Financial Industry Regulatory Authority (FINRA) is the primary regulator of approximately 5,000 broker-dealers registered in the United States (U.S.).

<sup>18</sup> "The net capital rule focuses on liquidity and is designed to protect securities customers, counterparties, and creditors by requiring that broker-dealers have sufficient liquid resources on hand at all times to satisfy claims promptly". Source: GAO Report Risk-Based Capital Regulatory and Industry Approaches to Capital and Risk, Report No. GGD-98-153, July 20, 1998.

and customer protection<sup>19</sup>). These regulations are intended to protect customers and financial institutions. This office also oversees the Securities Investor Protection Corporation and has approximately nine staff.<sup>20</sup>

- Office of Prudential Supervision and Risk Analysis: The staff (referred to as “monitors”) in this office work in teams of three to review each CSE firm. They perform their work mainly through periodic meetings and informal discussions with CSE staff. The staff also review CSE required financial filings. The staff have backgrounds in economics, accounting, and finance and expertise in credit, market, or liquidity risk. Approximately 13 individuals comprise the staff.
- Office of CSE Inspections: This office is responsible for conducting the inspections on the CSE firms. They have seven staff who are located in both Washington D.C. and New York.

**CSE Program.** In 2004, the Commission adopted rule amendments under the Securities and Exchange Act of 1934,<sup>21</sup> which created the voluntary CSE program. This program allows the Commission to supervise certain broker-dealer holding companies on a consolidated basis. In this capacity, Commission supervision extends beyond the registered broker-dealer to the unregulated affiliates of the broker-dealer and the holding company itself. The CSE program was designed to allow the Commission to monitor for financial or operational weakness in a CSE holding company or its unregulated affiliates that might place United States (U.S.) regulated broker-dealers and other regulated entities at risk.

A broker-dealer becomes a CSE by applying to the Commission for an exemption from the Commission’s standard net capital rule,<sup>22</sup> and the broker-dealer’s ultimate holding company consenting to group-wide Commission supervision, if it does not already have a principal regulator. By obtaining an exemption from the standard net capital rule, the CSE firms’ broker-dealers are permitted to compute net capital using an alternative method.<sup>23</sup>

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<sup>19</sup> The customer protection rule “is designed to ensure that customer property (securities and funds) in the custody of broker-dealers is adequately safeguarded.”

Source: GAO Report Risk-Based Capital Regulatory and Industry Approaches to Capital and Risk, Report No. GGD-98-153, July 20, 1998.

<sup>20</sup> The Securities Investor Protection Act of 1970, 15 U.S.C. § 78aaa *et. seq.*, as amended, was enacted to protect customers from losses resulting from a broker-dealers’ failure, thereby promoting investor confidence in the securities markets. The Securities Investor Protection Corporation was created by the Act to pay investor claims. (See 15 U.S.C. § 78ccc).

<sup>21</sup> Source: Final Rule: Alternative Net Capital Requirements for Broker-Dealers That Are Part of Consolidated Supervised Entities (69 Fed Reg. 34.428). Commission. 21 June 2004. <<http://www.sec.gov/rules/final/34-49830.htm>>.

<sup>22</sup> See 17 C.F.R. § 24015c3-1.

<sup>23</sup> The alternative capital method is based on mathematical models and scenario testing, while broker-dealers operating under the standard net capital rule must meet certain ratios and maintain minimum net capital levels based on the type of securities activities they conduct. (See 17 C.F.R. 240.15c3-1(a)(7)).

The Commission designed the CSE program to be broadly consistent with the Board of Governors of the Federal Reserve System's (Federal Reserve) oversight of bank holding companies. However, the CSE program "reflects the reliance of securities firms on mark-to-market accounting as a critical risk and governance control. Second, the design of the CSE regime reflects the critical importance of maintaining adequate liquidity in all market environments for holding companies that do not have access to an external liquidity provider."<sup>24</sup>

The CSE application process includes TM reviewing a firm's application<sup>25</sup> (for an exemption from the net capital rule) and makes a recommendation to the Commission. Approval of the firm's application is contingent on the firm agreeing to group-wide Commission supervision of the consolidated entity (including unregulated affiliates), if the firm does not already have a principal regulator. In addition, CSE firms must agree to:

- "Maintain and document an internal risk management control system for the affiliate group,"<sup>26</sup>
- "Calculate a group-wide capital adequacy measure consistent with the international standards adopted by the Basel Committee on Banking Supervision [<sup>27</sup>] ('Basel Standards')."<sup>28</sup> The CSEs are required to maintain an overall Basel capital ratio<sup>29</sup> of not less than the Federal Reserve's 10 percent "well-capitalized" standard for bank holding companies. The CSE must notify the Commission (e.g., file an Early Warning Notice) if the 10 percent capital ratio is or is likely to be violated,<sup>30</sup> or if tentative net capital of the broker-dealer falls below \$5 billion;<sup>31</sup>

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<sup>24</sup> Source: *Examining Regulation and Supervision of Industrial Loan Companies* Before US Senate Committee on Banking, Housing and Urban Affairs, 110<sup>th</sup> Cong. (October 4, 2007) (statement of Erik Sirri, Director of TM, Commission).

<sup>25</sup> The application process includes inspections whose purpose is to verify the information the firms provides during the application process and to "assess the adequacy of the implementation of the firm's internal risk management policies and procedures."

Source: SEC [Commission] [Holding Company Supervision Program Description](http://www.sec.gov/divisions/marketreg/hcsupervision.htm). Commission. 5 June 2008. <<http://www.sec.gov/divisions/marketreg/hcsupervision.htm>>.

<sup>26</sup> Source: SEC [Commission] [Holding Company Supervision Program Description](http://www.sec.gov/divisions/marketreg/hcsupervision.htm). Commission. 5 June 2008. <<http://www.sec.gov/divisions/marketreg/hcsupervision.htm>>.

<sup>27</sup> "The Basel Committee on Banking Supervision (Basel Committee) seeks to improve the quality of banking supervision worldwide, in part by developing broad supervisory standards. The Basel Committee consists of central bank and regulatory officials from 13 member countries: Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, the Netherlands, Spain, Sweden, Switzerland, United Kingdom, and United States. The Basel Committee's supervisory standards are also often adopted by nonmember countries." Source: GAO. [Bank Regulators Need to Improve Transparency and Overcome Impediments to Finalizing the Proposed Basel II Framework](#). Report No. 07-253, February 15, 2007.

<sup>28</sup> Source: SEC [Commission] [Holding Company Supervision Program Description](http://www.sec.gov/divisions/marketreg/hcsupervision.htm). Commission. 5 June 2008. <<http://www.sec.gov/divisions/marketreg/hcsupervision.htm>>. [footnote added]

<sup>29</sup> The Basel capital ratio is capital divided by risk weighted assets.

<sup>30</sup> We are aware of one instance where this occurred. In our opinion, TM acted reasonably.

<sup>31</sup> Sources for the information include:

- *Risk Management and its Implications for Systemic Risk* Before U.S. Senate Committee on Banking, Housing and Urban Affairs, 110<sup>th</sup> Cong. (June 19, 2008) (statement of Erik Sirri, Director of TM, Commission); and

- Maintain “sufficient stand-alone liquidity and sufficient financial resources to meet its expected cash outflows in a stressed liquidity environment where access to unsecured funding is not available for a period of at least one year. Another premise of this liquidity planning is that any assets held in a regulated entity are unavailable for use outside of the entity to deal with weakness elsewhere in the holding company structure, based on the assumption that during the stress event, including a tightening of market liquidity, regulators in the U.S. and relevant foreign jurisdictions would not permit a withdrawal of capital.”<sup>32</sup>
- “Consent to Commission examination [inspection] of the books and records of the ultimate holding company [*i.e.*, the consolidated entity] and its affiliates, where those affiliates do not have principal regulators;”<sup>33</sup>
- “Regularly report on the financial and operational condition of the holding company, and make available to the Commission information about the ultimate holding company or any of its material affiliates that is necessary to evaluate financial and operations risks within the ultimate holding company and its material affiliates;”<sup>34</sup> and
- “Make available [examination] inspection reports of principal regulators for those affiliates that are not subject to Commission [examination] inspection.”<sup>35</sup>

The firms agreed to consolidated supervision because of the preferential capital treatment under the alternative method and international requirements. The European Union’s (EU) Conglomerates Directive required that affiliates of U.S. registered broker-dealers demonstrate that they were subject to consolidated supervision by a U.S. regulator or face significant restrictions on their European operations.<sup>36</sup>

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- Final Rule: Alternative Net Capital Requirements for Broker-Dealers That Are Part of Consolidated Supervised Entities (69 Fed Reg. 34-428). Commission. 21 June 2004. <<http://www.sec.gov/rules/final/34-49830.htm>>.

<sup>32</sup> Source: *Risk Management and its Implications for Systemic Risk* Before U.S. Senate Committee on Banking, Housing and Urban Affairs, 110<sup>th</sup> Cong. (June 19, 2008) (statement of Erik Sirri, Director of TM, Commission).

<sup>33</sup> Source: SEC [Commission] Holding Company Supervision Program Description. Commission. 5 June 2008. <<http://www.sec.gov/divisions/marketreg/hcsupervision.htm>>.

<sup>34</sup> Source: SEC [Commission] Holding Company Supervision Program Description. Commission. 5 June 2008. <<http://www.sec.gov/divisions/marketreg/hcsupervision.htm>>.

<sup>35</sup> Source: SEC [Commission] Holding Company Supervision Program Description. Commission. 5 June 2008. <<http://www.sec.gov/divisions/marketreg/hcsupervision.htm>>.

<sup>36</sup> According to the CSE final rule, “EU [European Union] ‘consolidated supervision’ consists of a series of quantitative and qualitative rules, imposed at the level of the ultimate holding company, regarding firms’ internal controls, capital adequacy, intra-group transactions, and risk concentration. Without a demonstration of ‘equivalent’ supervision, U.S. securities firms have expressed concerns that an affiliate institution located in the EU either may be subject to additional capital charges or be required to form a sub-holding company in the EU.” See ‘Directive 2002/87/EC of the European Parliament and of the Council of 16 December 2002.’ Source: Final Rule: Alternative Net Capital Requirements for Broker-Dealers That Are Part of Consolidated Supervised Entities (69 Fed Reg. 34.428). Commission. 21 June 2004. <[http://www.sec.gov/rules/final/34-49830.htm#P42\\_10820](http://www.sec.gov/rules/final/34-49830.htm#P42_10820)>.

**Mortgage Loans.** Beginning around late 2004, lenders offered mortgages to individuals who did not meet the normal qualifications (e.g., income or credit history). Many of these loans had teaser rates and/or were interest only. These more risky loans are referred to as “subprime mortgages.” The theory behind approving these risky loans was that the homeowner would be able to refinance the loan in a few years because of the increased growth in home values and the individual’s improved credit rating. Banks converted these loans into securities and sold the securities to other firms (known as the securitization process).

Once home values began to decrease, mortgage loan defaults started to increase, causing the market value of the mortgage securities to decrease. In the ensuing months, the financial services industry wrote-down billions of dollars in the value of all types of mortgage securities.<sup>37</sup>

**Bear Stearns’ Collapse.**<sup>38</sup> The Bear Stearns Companies, Inc. (Bear Stearns) was a holding company that had two registered broker-dealers. Its main activities were investment banking, securities and derivatives sales and trading, clearance, brokerage and asset management.<sup>39</sup> Bear Stearns was highly leveraged<sup>40</sup> with a large exposure (i.e., concentration of assets) in mortgage-backed securities.<sup>41</sup> Bear Stearns also had less capital and was less diversified than several of the CSE firms.

In June 2007, two of Bear Stearns’ managed hedge funds collapsed because of subprime mortgage losses.<sup>42</sup> Nearly a year later, during the week of March 10, 2008, rumors spread about liquidity problems at Bear Stearns. Due to Bear Stearns’ lenders not rolling over secured financing, Bear Stearns faced severe liquidity problems on March 14, 2008.<sup>43</sup> As a result, on March 14, 2008, JP Morgan Chase & Co. (JP Morgan) provided Bear Stearns with emergency

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<sup>37</sup> In accordance with Generally Accepted Accounting Principles, the securities must be valued at fair market value (i.e., mark to market accounting).

<sup>38</sup> Sources for this information include:

- *Turmoil in U.S. Credit Markets: Examining the Recent Actions of Federal Financial Regulators Before U.S. Senate Committee on Banking, Housing and Urban Affairs, 110<sup>th</sup> Congress* (April 3, 2008) (statement of Timothy Geithner, President and Chief Executive Officer, Federal Reserve Bank of New York (FRBNY));
- *Turmoil in U.S. Credit Markets: Examining the Recent Actions of Federal Financial Regulators Before U.S. Senate Committee on Banking, Housing and Urban Affairs, 110<sup>th</sup> Congress* (April 3, 2008) (statement of Jamie Dimon (Chairman and Chief Executive Officer, JP Morgan); and
- *Turmoil in U.S. Credit Markets: Examining the Recent Actions of Federal Financial Regulators Before U.S. Senate Committee on Banking, Housing and Urban Affairs, 110<sup>th</sup> Congress* (April 3, 2008) (statement of Alan Schwartz (President and Chief Executive Officer, Bear Stearns)).

<sup>39</sup> Source: 2006 Bear Stearns’ Annual Report (page 32).

<sup>40</sup> There are many definitions of leverage. A simple definition of leverage is assets divided by capital. Bear Stearns’ gross leverage ratio was about 33-1. See Appendix IX.

<sup>41</sup> Depending on the definition used to classify a mortgage as “subprime”, Bear Stearns’ exposure to subprime mortgages varied. However, it clearly had a large exposure to mortgage securities overall.

<sup>42</sup> Bear Stearns’ direct exposure to these hedge funds was minimal.

<sup>43</sup> A pledge of collateral supports secured financing.

funding.<sup>44</sup> According to Congressional testimony,<sup>45</sup> after the markets closed on March 14, 2008, it became apparent that FRBNY's funding could not stop Bear Stearns' downward spiral. As a result, Bear Stearns concluded that it would need to file for bankruptcy protection on March 17, 2008, unless another firm purchased it.<sup>46</sup> On March 16, 2008, Bear Stearns' sale to JP Morgan was announced with financing support from the FRBNY. In May 2008, the sale was completed.

In testimony given before the Senate Committee on Banking, Housing, and Urban Affairs on April 3, 2008, Chairman Christopher Cox stated that Bear Stearns' collapse was due to a liquidity crisis caused by a lack of confidence.<sup>47</sup> Chairman Cox described Bear Stearns' collapse as a "run on the bank"<sup>48</sup> which occurred exceptionally fast and in an already distressed market environment (*i.e.*, the credit crisis). Specifically, Chairman Cox testified as follows:

What happened to Bear Stearns during the week of March 10th was likewise unprecedented. For the first time, a major investment bank that was well-capitalized and apparently fully liquid experienced a crisis of confidence that denied it not only unsecured financing, but short-term secured financing, even when the collateral consisted of agency securities with a market value in excess of the funds to be borrowed. Counterparties would not provide securities lending services and clearing services. Prime brokerage clients moved their cash balances elsewhere. These decisions by counterparties, clients, and lenders to no longer transact with Bear Stearns in turn influenced other counterparties, clients, and lenders to also reduce their exposure to Bear Stearns.<sup>49</sup>

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<sup>44</sup> The funding was from FRBNY through JP Morgan to Bear Stearns because JP Morgan could borrow money from FRBNY.

<sup>45</sup> Source: *Turmoil in U.S. Credit Markets: Examining the Recent Actions of Federal Financial Regulators* Before U.S. Senate Committee on Banking, Housing and Urban Affairs, 110<sup>th</sup> Congress (April 3, 2008) (statements of Timothy Geithner, President and Chief Executive Officer, FRBNY) and Alan Schwartz, President and Chief Executive Officer, Bear Stearns).

<sup>46</sup> Source: *Turmoil in the U.S. Credit Markets: Examining the Regulation of Investment Banks by the Securities and Exchange Commission* Before the U.S. Senate on Securities, Insurance, and Investment 110<sup>th</sup> Cong. (May 7, 2008) (statement of Erik Sirri, Director of TM, Commission).

<sup>47</sup> Source: *Turmoil in U.S. Credit Markets: Examining the Recent Actions of Federal Financial Regulators* Before US Senate Committee on Banking, Housing and Urban Affairs, 110<sup>th</sup> Cong. (April 3, 2008) (statement of Christopher Cox, Chairman, Commission).

<sup>48</sup> Source: *Turmoil in U.S. Credit Markets: Examining the Recent Actions of Federal Financial Regulators* Before US.. Senate Committee on Banking, Housing and Urban Affairs, 110<sup>th</sup> Cong. (April 3, 2008) (statement of Christopher Cox, Chairman, Commission).

<sup>49</sup> Source: *Turmoil in U.S. Credit Markets: Examining the Recent Actions of Federal Financial Regulators* Before U.S. Senate Committee on Banking, Housing and Urban Affairs, 110<sup>th</sup> Cong. (April 3, 2008) (statement of Christopher Cox, Chairman, Commission).



According to a Commission press release,<sup>50</sup> TM monitored Bear Stearns' capital and liquidity daily since Bear Stearns' hedge funds collapsed. According to data (provided to TM by Bear Stearns), there was adequate capital at the holding company level and at Bear Stearns' two registered broker-dealers prior to and during the week of March 10, 2008. In addition, the Commission stated that Bear Stearns was compliant with the \$5 billion liquidity requirement.<sup>51</sup> Furthermore, according to data we reviewed, Bear Stearns had significantly increased its liquidity levels since May 2007.<sup>52</sup>

The Commission stated that neither the CSE program nor any regulatory model (*i.e.*, the Basel Standards)<sup>53</sup> used by commercial or investment banks considered the possibility that secured financing, even when backed by high-quality collateral could become completely unavailable. Instead, the CSE program only considered that a deterioration of secured financing could occur (*e.g.*, that financing terms could become less favorable) and that unsecured funding could be unavailable for at least one year.

**The Commission's Response to Bear Stearns' Collapse.** In the aftermath of Bear Stearns' collapse, the Commission has:

- Supported the work of the Basel Committee on Banking Supervision regarding their planned updated guidance (*i.e.*, strengthening the standards applicable to liquidity risks) on liquidity management;<sup>54</sup>
- Supported legislation to make the CSE program mandatory.<sup>55</sup> At a recent Congressional hearing before the Committee on Financial Services, House of Representatives, July 24, 2008, Chairman Christopher Cox stated:

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<sup>50</sup> Source: Statement of SEC Division of Trading and Markets Regarding The Bear Stearns Companies. Commission. 14 March 2008. <<http://www.sec.gov/news/press/2008/2008-44.htm>>. The Chairman also made similar statements in his letter to the Basel Committee regarding liquidity management; and testimony (*Turmoil in U.S. Credit Market: Examining the Recent Actions of Federal Financial Regulators Before US Senate Committee on Banking, Housing and Urban Affairs, 110th Cong. (April 3, 2008)*) (statement of Christopher Cox, Chairman, Commission).

<sup>51</sup> As discussed in the Scope and Methodology section (see Appendix IV), we did not independently verify (*i.e.*, recalculate and determine the accuracy) Bear Stearns' capital or liquidity amounts.

<sup>52</sup> According to the Commission, Bear Stearns had a high of \$21 billion (in liquidity) in early March 2008, (*i.e.*, before the week of March 10), compared to \$7.6 billion in May 2007 according to TM data. Source: Chairman Cox Letter to Basel Committee in Support of New Guidance on Liquidity Management. Commission. 14 March 2008. <<http://www.sec.gov/news/press/2008/2008-48.htm>>.

<sup>53</sup> The CSE firms operate under the Basel II standards.

<sup>54</sup> Source: Chairman Cox Letter to Basel Committee in Support of New Guidance on Liquidity Management. Commission. 14 March 2008. <<http://www.sec.gov/news/press/2008/2008-48.htm>>.

<sup>55</sup> Sources of this information include:

- *Risk Management and its Implications for Systemic Risk* Before U.S. Senate Committee on Banking, Housing and Urban Affairs, 110<sup>th</sup> Cong. (June 19, 2008) (statement of Erik Sirri, Director of TM, Commission); and
- *Systemic Risk and the Financial Markets* Before U.S. House of Representatives Committee on Financial Services, 110<sup>th</sup> Cong. (July 24, 2008) (statement of Christopher Cox, Chairman, Commission).

The mandatory consolidated supervision regime for investment banks should provide the SEC [Commission] with several specific authorities. Broadly, with respect to the holding company, these include authority to: set capital and liquidity standards; set recordkeeping and reporting standards; set risk management and internal control standards; apply progressively more significant restrictions on operations if capital or liquidity adequacy falls, including requiring divestiture of lines of business; conduct examinations and generally enforce the rules; and share information with other regulators. Any future legislation should also establish a process for handling extraordinary problems, whether institution-specific or connected with broader market events, to provide needed predictability and certainty.<sup>56</sup>

- Requested dedicated Congressional funding for the CSE program and increased CSE staffing from about 25 to 40 people;<sup>57</sup>
- Consulted with the CSE firms on their liquidity situation (e.g., funding plans). Specifically, the Commission worked with the firms to:
  - increase their liquidity levels;<sup>58</sup>
  - lengthen the terms of their secured and unsecured financing;<sup>59</sup>
  - review their risk practices and models;<sup>60</sup>
  - discuss their long-term funding plans, including plans for raising new capital by accessing the equity and long-term debt markets;<sup>61</sup>
  - increase their public disclosures of their capital and liquidity;<sup>62</sup>

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<sup>56</sup> Source: *Systemic Risk and the Financial Markets* Before U.S. House of Representatives Committee on Financial Services, 110<sup>th</sup> Cong. (July 24, 2008) (statement of Christopher Cox, Chairman, Commission).

<sup>57</sup> Source: *Risk Management and its Implications for Systemic Risk* Before U.S. Senate Committee on Banking, Housing and Urban Affairs, 110<sup>th</sup> Cong. (June 19, 2008) (statement of Erik Sirri, Director of TM, Chairman, Commission).

<sup>58</sup> Source: *Turmoil in U.S. Credit Market: Examining the Recent Actions of Federal Financial Regulators*, Before the U.S. Senate Committee on Banking, Housing, and Urban Affairs, 110<sup>th</sup> Cong. (April 3, 2008) (statement of Christopher Cox, Chairman, Commission).

<sup>59</sup> Source: *Turmoil in the U.S. Credit Markets: Examining the Regulation of Investment Banks by the Securities and Exchange Commission* Before the U.S. Senate on Securities, Insurance, and Investment 110<sup>th</sup> Cong. (May 7, 2008) (statement of Erik Sirri, Director of TM, Commission).

<sup>60</sup> Source: *Turmoil in the U.S. Credit Markets: Examining the Regulation of Investment Banks by the Securities and Exchange Commission* Before the U.S. Senate on Securities, Insurance, and Investment 110<sup>th</sup> Cong. (May 7, 2008) (statement of Erik Sirri, Director of TM, Commission).

<sup>61</sup> Source: *Systemic Risk and the Financial Markets* Before U.S. House of Representatives Committee on Financial Services, 110<sup>th</sup> Cong. (July 24, 2008) (statement of Christopher Cox, Chairman, Commission).

- Invited FRBNY examiners to review the CSE firms' funding and how the firms are managing their funding,<sup>63</sup> and
- In July 2008, the Commission and the Federal Reserve agreed on a Memorandum of Understanding (MOU) involving coordination and information sharing.<sup>64</sup>

## Objectives

As a result of the collapse of Bear Stearns in March 2008, we received a Congressional request to perform this audit of the Commission's CSE Program, in addition to an audit of the Commission's Broker-Dealer Risk Assessment Program (see Appendix II).

The objectives of this audit were to evaluate the Commission's CSE program, emphasizing the Commission's oversight of Bear Stearns and to determine whether improvements are needed in the Commission's monitoring of CSE firms and its administration of the CSE program.

The objectives of the audit on the Commission's Broker-Dealer Risk Assessment Program were to follow up on recommendations made in the Office of Inspector General's (OIG) prior audit report of the Risk Assessment Program (*Broker-Dealer Risk Assessment Program*, Report No. 354, issued on August 13, 2002) and to examine the Broker-Dealer Risk Assessment process to determine whether improvements are needed. Audit report number 446-B discusses the Risk Assessment Program in detail and addresses these objectives.

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<sup>62</sup> Source: Speech by SEC [Commission] Chairman: Address to the Security Traders 12th Annual Washington Conference. Commission. 7 May 2008. <<http://www.sec.gov/news/speech/2008/spch050708cc.htm>>.

<sup>63</sup> Source: *Turmoil in U.S. Credit Market: Examining the Recent Actions of Federal Financial Regulators* Before US Senate Committee on Banking, Housing, and Urban Affairs, 110<sup>th</sup> Cong. (April 3, 2008) (statement of Christopher Cox, Chairman, Commission).

<sup>64</sup> SEC [Commission], *FRB Sign Agreement to Enhance Collaboration, Coordination and Information Sharing*. Commission. 7 July 2008. <<http://www.sec.gov/news/press/2008/2008-134.htm>>.

## Findings and Recommendations

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### **Finding 1: Bear Stearns Was Compliant With The CSE Program's Capital Ratio And Liquidity Requirements, But The Collapse Of Bear Stearns Raises Questions About The Adequacy Of These Requirements** <sup>65</sup>

Bear Stearns was compliant with the capital and liquidity requirements; however, its collapse raises serious questions about the adequacy of these requirements.

#### **Capital** <sup>66</sup>

##### Adequacy of Capital Levels

In 2004, the Commission adopted rule amendments under the Securities and Exchange Act of 1934, which created the CSE program and allowed broker-dealers to apply for an exemption from the net capital rule and instead use the alternative capital method.<sup>67</sup> The Commission designed the CSE program to be broadly consistent with the Federal Reserve's oversight of bank holding companies. However, the CSE program "reflects the reliance of securities firms on mark-to-market accounting [<sup>68</sup>] as a critical risk and governance control. Second, the design of the CSE regime reflects the critical importance of maintaining adequate liquidity in all market environments for holding companies that do not have access to an external liquidity provider."<sup>69</sup>

If approved, a firm must comply with capital requirements at both the holding company and the broker-dealer levels. The CSEs at the holding company level are required to maintain an overall Basel capital ratio of not less than the Federal

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<sup>65</sup> The capital ratio requirement is stipulated by Basel II, which TM incorporated into the CSE program. TM developed the CSE program's liquidity requirements.

<sup>66</sup> Capital is the difference between a firm's assets and liabilities.

Source: Answers to Frequently Asked Investor Questions Regarding The Bear Stearns Companies, Inc. Commission. 8 March 2008. <<http://www.sec.gov/news/press/2008/2008-46.htm>>.

<sup>67</sup> The alternative capital method is based on mathematical models and scenario testing while broker-dealers operating under the standard net capital rule must meet certain ratios and maintain minimum net capital levels based on the type of securities activities they conduct.

<sup>68</sup> Mark-to-market accounting refers to a requirement that the securities must be valued at fair market value in accordance with Generally Accepted Accounting Principles.

<sup>69</sup> Source: *Examining Regulation and Supervision of Industrial Loan Companies* Before U.S. Senate Committee on Banking, Housing and Urban Affairs, 110<sup>th</sup> Cong. (October 4, 2007) (statement of Erik Sirri, Director of TM, Commission).

Reserve's 10 percent "well-capitalized" standard for bank holding companies.<sup>70</sup> In addition, a broker-dealer calculating its capital using the alternative method must maintain tentative net capital<sup>71</sup> of at least \$1 billion and net capital of at least \$500 million. If the tentative net capital of a broker-dealer using alternative method falls below \$5 billion, it must notify the Commission.<sup>72</sup>

According to Bear Stearns' data, it exceeded the required capital amounts at the holding company and broker-dealer level the entire time it was in the CSE program, including during the week of March 10, 2008.<sup>73</sup> Although Bear Stearns was compliant with the capital requirements, there are serious questions about whether the capital requirement amounts were adequate.<sup>74</sup> For instance, some individuals have speculated that Bear Stearns would not have collapsed if it had more capital than was required by the CSE program. In fact, a former Director of TM has stated:<sup>75</sup>

The losses incurred by Bear Stearns and other large broker-dealers were not caused by 'rumors' or a 'crisis of confidence,' but rather by inadequate net capital and the lack of constraints on the incurring of debt.

#### Increased Access to Secured Financing

Notwithstanding the fact that Bear Stearns was compliant with the CSE program's capital requirements, there are serious questions about whether Bear Stearns had enough capital to sustain its business model. As the subprime crisis unfolded, Bear Stearns' cost of unsecured financing tended to increase. For example, by March 2008, a ten-year bond which had recently been issued at a spread of 362 basis points over Treasury rates was trading at 460 basis points over Treasury rates. The high spread indicates that market participants believed that Bear Stearns' creditworthiness was deteriorating in a manner consistent with downgrades by ratings agencies. According to the expert retained by the OIG in connection with this audit,<sup>76</sup> the high cost of financing tended to undermine the

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<sup>70</sup> Source: SEC [Commission] Holding Company Supervision with Respect to Capital Standards and Liquidity Planning. Commission. 7 Mar 2007. <<http://www.sec.gov/divisions/marketreg/hcliqidity.htm>>.

<sup>71</sup> Tentative capital is net capital before deductions for market and credit risk.

<sup>72</sup> Source: Final Rule: Alternative Net Capital Requirements for Broker-Dealers That Are Part of Consolidated Supervised Entities (69 Fed Reg. 34.428). Commission. 21 June 2004. <<http://www.sec.gov/rules/final/34-49830.htm>>.

<sup>73</sup> Source: Chairman Cox Letter to Basel Committee in Support of New Guidance on Liquidity Management. Commission. 14 March 2008. <<http://www.sec.gov/news/press/2008/2008-48.htm>>.

<sup>74</sup> It is worth noting that prior to the current mortgage crisis, a main concern surrounding the securities industry was a real/perceived lack of competitiveness with overseas markets. One specific area of concern was that U.S. firms were potentially at a competitive disadvantage because U.S. regulators were requiring excessive capital compared to foreign banks. Source: Sustaining New York's and the US' Global Financial Services Leadership (Recommendation 6, page 24) by McKinsey & Company.

<sup>75</sup> Source: Pickard Lee. "SEC's [Commission] Old Capital Approach Was Tried-and-True." American Banker August 8, 2008.

<sup>76</sup> Professor Albert S. (Pete) Kyle was retained by the Office of Inspector General (OIG) to provide assistance with this audit. See Appendix III for Professor Kyle's Curriculum Vitae and the Methodology section of Appendix IV.

viability of Bear Stearns' business model, which relied heavily on leverage. Therefore, to preserve the viability of its business model, Bear Stearns had a strong incentive to lower its financing costs. One way to lower borrowing costs is to raise new equity capital, thus providing a larger equity cushion to protect unsecured lenders. To the extent that secured financing was cheaper than unsecured financing, another way for Bear Stearns to lower its borrowing costs was to shift its funding model from unsecured to secured financing.

From April 2006 to March 2008, Bear Stearns' Basel capital ratio decreased from 21.4 percent to 11.5 percent.<sup>77</sup> TM memoranda suggest that in March 2008, TM inquired about whether Bear Stearns was contemplating capital infusions, but the memorandum does not suggest that TM exerted influence over Bear Stearns to raise additional capital.<sup>78</sup> The OIG expert was unable to find TM memoranda indicating that TM had formally required or informally pressured Bear Stearns to raise additional equity capital prior to March 2008. In this sense, TM acted as though it did not believe it had a mandate to compel Bear Stearns to raise additional capital as long as its Basel capital ratio was greater than 10%. In fact, Bear Stearns did not raise additional capital during this time in 2007 or 2008.

According to TM's documentation of its meetings with Bear Stearns, in November 2006, Bear Stearns initiated a plan to increase its availability of secured funding at the holding company level.<sup>79</sup> One component of this plan involved a tri-party repurchase agreement<sup>80</sup> with secured lenders, giving Bear Stearns access to \$1 to \$1.5 billion from each lender.<sup>81</sup> Bear Stearns' secured borrowings were initially for terms of 30 days, with the goal of extending the terms to six months to one year.<sup>82</sup> By May 2007, Bear Stearns' short-term borrowing was 60 percent secured and by September 2007, it was 74 percent secured.<sup>83</sup> Finally, by March 2008, Bear Stearns' short-term borrowing was 83 percent secured.<sup>84</sup> Nevertheless, Bear Stearns was still unable to obtain adequate secured funding to save the firm in March 2008.

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<sup>77</sup> Source: Bear Stearns monthly Commission filings.

<sup>78</sup> "We (Eric Sirri I believe) inquired about any discussions they were having at the moment in terms of capital infusions. Allan [sic] [Schwartz, the President and Chief Executive Officer of Bear Stearns] said there were no 'terribly current discussions'. They had hired Lazard to advise them but that was on "slow burn" and that with the time it would take to get that done it wouldn't help (rumors would cause more damage in the meantime)."

Source: TM internal memorandum (file name: "Bear Stearns March Notes - SMS.doc").

<sup>79</sup> Source: TM's internal quarterly meeting memoranda with Bear Stearns for the 4<sup>th</sup> quarter 2006, 1<sup>st</sup> quarter 2007, 2<sup>nd</sup> quarter 2007, and 3<sup>rd</sup> quarter 2007.

<sup>80</sup> In a tri-party repo arrangement, a third party (in this case JP Morgan) acts as a custodian for loans between Bear Stearns and other lenders. The custodian holds Bear Stearns assets as collateral for the loans from the other lenders. Bear Stearns used this tri-party repurchase agreement (repo) facility to finance assets which were otherwise difficult to fund.

<sup>81</sup> Source: TM's internal quarterly meeting memorandum with Bear Stearns for the 4<sup>th</sup> quarter of 2006.

<sup>82</sup> Source: TM's internal quarterly meeting memorandum with Bear Stearns for the 4<sup>th</sup> quarter of 2006.

<sup>83</sup> Source: TM's internal quarterly meeting memoranda with Bear Stearns for the 2<sup>nd</sup> quarter 2007 and 3<sup>rd</sup> quarter 2007.

<sup>84</sup> Source: TM internal memorandum (file name: BS Monthly Liquidity Call\_03-06-08.doc).

Bear Stearns' increasing reliance on secured funding indicates that, although it appeared to be compliant with CSE program's capital requirement, the market did not perceive it to be sufficiently capitalized to justify extensive unsecured lending. In this sense, Bear Stearns was not adequately capitalized.

These facts illustrate that although Bear Stearns was compliant with the CSE program's ten percent Basel capital requirement, it was not sufficiently capitalized to attract the funding it needed to support its business model. Although the Commission has maintained that liquidity (not capital) problems caused Bear Stearns' collapse, this audit found that it is entirely possible that Bear Stearns' capital levels could have contributed to its collapse by making lenders unwilling to provide Bear Stearns the funding it needed.

The fact that Bear Stearns collapsed while it was compliant with the CSE program's capital requirements raises serious questions about the adequacy of the CSE program's capital ratio requirements.

The CSE capital requirements are broadly consistent with the Basel II framework. The Basel II framework is based on three pillars: (1) minimum capital requirements, (2) supervisory review, and (3) market discipline in the form of increased public disclosure.<sup>85</sup> CSE firms calculate their capital ratios in a manner consistent with a models-based approach of pillar 1. Under pillar 2, supervisors are required to ensure that banks comply with the minimum capital requirements of pillar 1; address risks not fully captured by pillar 1, including liquidity risk and credit concentration risk; and encourage good risk management practices. Under pillar 2, supervisors should expect banks to operate above the minimum regulatory capital ratios, and should intervene at an early stage to prevent banks from falling below minimum levels required to support the risk characteristics of a particular bank, including requiring banks to raise additional capital immediately.<sup>86</sup> Pillar 3 establishes disclosure requirements that aim to inform market participants about banks' capital adequacy in a consistent framework that enhances comparability.<sup>87</sup> The Basel II framework does not dictate a maximum capital ratio, but instead gives the supervisor the ability to set a high enough capital ratio to be consistent with the characteristics of the banks it regulates.

#### **Recommendation 1:**

The Division of Trading and Markets, in consultation with the Board of Governors of the Federal Reserve System and the Basel Committee should: (1) reassess the guidelines and rules regarding the Consolidated Supervised Entity (CSE)

<sup>85</sup> Source: GAO. Bank Regulators Need to Improve Transparency and Overcome Impediments to Finalizing the Proposed Basel II Framework. Report No. 07-253, page 20. February 15, 2007.

<sup>86</sup> Source: Basel Committee on Banking Supervision. International Convergence on Capital Measurement and Capital Standards, June 2006, paragraphs 9 and 756-760. < <http://www.bis.org/publ/bcbs128.pdf>>.

<sup>87</sup> Source: GAO. Bank Regulators Need to Improve Transparency and Overcome Impediments to Finalizing the Proposed Basel II Framework. Report No. 07-253, page 91. February 15, 2007.

firms' capital levels; and (2) identify instances (e.g., a firm's credit rating is downgraded, or its unsecured debt trades at high spreads over Treasuries) when firms should be required to raise additional capital, even if the firm otherwise appears to be well capitalized according to CSE program requirements.

## Liquidity<sup>88</sup>

The Commission designed the CSE program to ensure that, in a stressed environment, a firm could withstand the loss of its unsecured financing for up to one year,<sup>89</sup> under the assumption that secured funding for liquid assets would be available. In addition, the liquidity analysis assumes that any assets held in a regulated entity are unavailable for use outside of the entity to deal with liquidity issues elsewhere in the consolidated entity.<sup>90</sup> The CSE program's guidelines on liquidity implement supervisory principles concerning liquidity in a manner that attempts to be consistent with pillar 2 of Basel II.<sup>91</sup>

According to agreements between the Commission and the United Kingdom's Financial Services Authority entered into in April 2006, each CSE is required to maintain a liquidity portfolio of cash or highly liquid debt and equity securities of \$10 billion, with the exception of Bear Stearns, which was required to maintain a liquidity portfolio of \$5 billion. The liquidity requirement for Bear Stearns was lower because it was the smallest CSE. Bear Stearns was continuously compliant with this requirement.

Bear Stearns initiated a plan in November 2006 to increase its liquidity levels and in fact (according to TM data), it significantly increased its liquidity levels from

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<sup>88</sup> According to the Commission, "[i]t is important to realize capital is not synonymous with liquidity. A firm can be highly capitalized, that is, can have more assets than liabilities, but can have liquidity problems if the assets cannot quickly be sold for cash or alternative sources of liquidity, including credit, obtained to meet other demands. While the ability of a securities firm to withstand market, credit, and other types of stress events is linked to the amount of capital the firm possesses, the firm also needs sufficient liquid assets, such as cash and U.S. Treasury securities, to meet its financial obligations as they arise.

Accordingly, large securities firms must maintain a minimum level of liquidity in the holding company. This liquidity is intended to address pressing needs for funds across the firm. This liquidity consists of cash and highly liquid securities for the parent company to use without restriction."

Source: Answers to Frequently Asked Investor Questions Regarding The Bear Stearns Companies, Inc. Commission. 18 March 2008. <<http://www.sec.gov/news/press/2008/2008-46.htm>>.

<sup>89</sup> Source: Risk Management and its Implications for Systemic Risk Before the U.S. Senate Subcommittee on Securities, Insurance, and Investment Committee on Banking, Housing, and Urban Affairs, 110<sup>th</sup> Cong. (June 19, 2008) (statement by Erik Sirri, Director of TM, Commission).

<sup>90</sup> Source: SEC [Commission] Holding Company Supervision Program Description. Commission. 5 June 2008. <<http://www.sec.gov/divisions/marketreg/hcsupervision.htm>>.

<sup>91</sup> Sources for this information include:

- Basel Committee on Banking Supervision. International Convergence on Capital Measurement and Capital Standards, June 2006, paragraphs 738 and 741. <<http://www.bis.org/publ/bcbs128.pdf>>; and
- Basel Committee on Banking Supervision. Sound Practices for Managing Liquidity in Banking Organizations, February 2000. <<http://www.bis.org/publ/bcbs69.pdf?noframes=1>>.



May 2007 until it suddenly collapsed during one week in March 2008.<sup>92</sup> According to the Commission, Bear Stearns collapsed because it experienced a liquidity crisis when it lost its secured financing. The collapse of Bear Stearns thus indicates that the CSE program's liquidity guidelines (implementing the spirit of pillar 2 of Basel II) are inadequate in two respects. First, the time horizon over which a liquidity crisis unfolds is likely to be significantly less than the one-year period. Second, secured lending facilities are not automatically available in times of stress.

Bear Stearns' liquidity planning indicates that Bear Stearns was well aware of these impractical aspects of the CSE program's approach to liquidity more than a year before it failed. At a quarterly meeting with TM in April 2006, Bear Stearns told TM that it had developed a 60-day cash inflow and outflow analysis that it could use to track cash flows on a daily basis.<sup>93</sup> Bear Stearns told TM that the 60-day stress test "provides a detailed cash inflows and outflows analysis during the most critical part of a liquidity crisis."<sup>94</sup> The 60-day analysis, however, did not assume that secured funding was always available. Instead, the analysis assumed the availability of existing credit lines.<sup>95</sup> A 60-day period corresponds more closely than a one-year period to the timeframe over which a liquidity crisis unfolds. A 60-day period also corresponds to a time period over which a firm can raise new equity capital in an orderly manner. In this sense, Bear Stearns realized that the one-year period was not realistic and also recognized that secured funding might not be available in times of stress.

In November 2006, Bear Stearns also undertook efforts to line up *committed* secured lending facilities. The fact that Bear Stearns made a special effort to line up committed secured lending facilities indicates that Bear Stearns did not think that such facilities would automatically be available in a stressed environment. Bear Stearns told TM that the secured funding initiative was improving the firm's performance in the 60-day stress scenarios, because the 60-day stress scenarios did not assume that secured funding would always be available as contemplated by the CSE program's one-year liquidity stress test. Bear Stearns planned to extend its 60-day stress model to one year and to modify its analysis to include unused credit lines only to the extent that they were committed.<sup>96</sup> As part of its secured funding initiative, Bear Stearns planned to use uncommitted lines of credit on an ongoing basis, thus increasing its access

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<sup>92</sup> According to the Commission, Bear Stearns had a high liquidity level of \$21 billion in early March 2008 (i.e., before the week of March 10) compared to \$7.6 billion in May 2007 (according to TM data). Bear Stearns' required liquidity was \$5 billion.

<sup>93</sup> Source: TM's internal quarterly meeting memorandum with Bear Stearns for the 1<sup>st</sup> quarter of 2006.

<sup>94</sup> Source: TM's internal quarterly meeting memorandum with Bear Stearns for the 2<sup>nd</sup> quarter of 2006.

<sup>95</sup> Source: The Bear Stearns Companies Inc. Financial Review - Quarter ended February 28, 2007 Meeting held April 18, 2007 and Conference call held on April 24, 2007.

<sup>96</sup> Source: TM's internal quarterly meeting memoranda with Bear Stearns for the 2<sup>nd</sup> quarter of 2007 and 3<sup>rd</sup> quarter of 2007.

to credit in a stressed environment where uncommitted lines might not be available.<sup>97</sup>

Internal TM memoranda indicate that TM believed that the secured funding initiative helped Bear Stearns weather the credit difficulties it faced during the summer of 2007, when two hedge funds sponsored by Bear Stearns' Asset Management (BSAM) failed.<sup>98</sup>

According to internal TM memoranda, Bear Stearns had a goal of arranging committed secured evergreen facilities with terms of six to twelve months. An evergreen facility allows a borrower to lock in funding for a predetermined minimum period of time. For example, in a six-month evergreen facility, the lender must give notice to terminate the facility six months before being entitled to start getting its money back. If Bear Stearns had such facilities, which were terminated, such terminations would have created potential financial stress for Bear Stearns with a known, contractually predetermined time lag. Therefore, it would have been important for TM to know about such terminations, in order for TM to anticipate the potential financial stress. OIG has asked TM for information concerning whether TM knew about terminations of any evergreen facilities providing secured collateralized lending to Bear Stearns, but OIG has been unable to determine what additional information TM had about any such facilities, including terminations.

To summarize, as early as November 2006, Bear Stearns was implementing a more realistic approach to liquidity planning than contemplated by the CSE programs' liquidity stress test. While this more realistic approach may have helped Bear Stearns in the summer of 2007, it was not sufficient to save the firm in March 2008. Bear Stearns' initiative to line up secured funding indicates that the crisis which occurred in March 2008 was not totally unanticipated by Bear Stearns, in that Bear Stearns had been taking specific steps to avoid such a crisis for more than a year before it occurred.

According to the expert retained by OIG in conjunction with this audit, the need for Basel II firms to undertake specific efforts to line up committed secured funding in advance of a stressed environment depends on the extent to which the Basel II firms can rely on secured lending facilities from the central bank

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<sup>97</sup> Source: TM's internal quarterly meeting memorandum with Bear Stearns for the 3<sup>rd</sup> quarter of 2007.

<sup>98</sup> "By early summer 2007, the firm had made substantial progress on its [secured funding] initiatives, reducing commercial paper substantially and increasing the pool of liquidity available to the parent company. This progress proved to be very important. In August of 2007 the collapse of two Bear [Bear Stearns] managed hedge funds prompted S&P to change its outlook on Bear Stearns' debt to 'Negative'. This rating agency action and a poorly received investor call that followed led to some creditor anxiety around the Bear Stearns' name. Because of this idiosyncratic news, along with the general stress that began in the funding markets in August, OPSRA began monitoring Bear Stearns' liquidity on a daily basis. Obviously the funding enhancements that began in the earlier part of the year helped the firm in managing throughout these challenging times."

Source: TM internal memorandum with Bear Stearns for the 3<sup>rd</sup> quarter 2007 (file name: BS\_risk\_iden\_qtr3\_2007\_v2.doc).

during a liquidity crisis. On the one hand, if it is assumed that secured lending facilities will always be available from the central bank, lining up committed secured lending facilities is not necessary. In this case, a liquidity stress test, which assumes that secured lending facilities will automatically be available is appropriate. On the other hand, if it is assumed that collateralized central bank lending facilities might not be available during a time of market stress, Basel II firms have incentives to line up committed secured lending facilities, in advance, from other sources. In the context of CSE firms which are not banks, the policies of the Federal Reserve towards making collateralized loans to non-banks becomes an important element of their liquidity planning process.

Subsequent to the collapse of Bear Stearns, the Basel Committee released a draft set of updated guidelines concerning supervision of liquidity.<sup>99</sup>

**Recommendation 2:**

The Division of Trading and Markets, in consultation with the Board of Governors of the Federal Reserve System, should reassess pillar 2 of the Basel II framework and the Consolidated Supervised Entity (CSE) program guidelines regarding liquidity and make appropriate changes to the CSE program's liquidity requirements. Changes should describe assumptions CSE firms should be required to make about availability of secured lending in times of stress (including secured lending from the Federal Reserve) and should spell out circumstances in which CSE firms should be required to increase their liquidity beyond levels currently contemplated by CSE program liquidity requirements.

## **Finding 2: TM Did Not Adequately Address Several Significant Risks That Impact The Overall Effectiveness Of The CSE Program**

TM did not adequately address several significant risks, which affected the overall effectiveness of the CSE program. Notes from TM's meeting with Bear Stearns' management indicate that TM often discussed risks, which turned out to be relevant, but the discussions did not prompt TM to exert sufficient influence over Bear Stearns to make changes as a result of the risks identified.

### **Concentration of Assets**

Bear Stearns had a high concentration of mortgage securities. Prior to Bear Stearns becoming a CSE, TM was aware that its concentration of mortgage securities had been steadily increasing. For instance, TM stated:

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<sup>99</sup> Source: Basel Committee on Banking Supervision. Principles for Sound Liquidity Risk Management and Supervision. June 2008 – Draft for Consultation. <<http://www.bis.org/publ/bcbs138.pdf?noframes=1>>.

... [Bear Stearns] continues to push for increased balance sheet and risk taking authority despite six limit increases since 2001. These increases have brought the total permitted balance sheet usage from less than \$2 billion to over \$6 billion.<sup>100</sup>

TM staff even found that the amount of mortgage securities was occasionally well beyond Bear Stearns' internal limits. For instance, TM stated:

We [TM staff] will continue to discuss with risk management the size of the Adjustable Rate Mortgage ("ARM") business as it continues to operate *in excess of allocated limits*, reaching new highs with respect to the net market value of its positions.<sup>101</sup>  
[Emphasis Added]

Furthermore, according to TM's own documentation, a portion of Bear Stearns' mortgage securities (*e.g.*, adjustable rate mortgages) represented a significant concentration of market risk, as was evidenced by Bear Stearns' collapse. Paragraph 777 of Basel II framework states:

In the course of their activities, supervisors should assess the extent of a bank's credit risk concentrations, how they are managed, and the extent to which the bank considers them in its internal assessment of capital adequacy under Pillar 2. Such assessments should include reviews of the results of a bank's stress tests. Supervisors should take appropriate actions where the risks arising from a bank's credit risk concentrations are not adequately addressed by the bank.<sup>102</sup>

Yet, notwithstanding these "red flags" that TM knew about, and warnings in the Basel standards, TM did not make any efforts to limit Bear Stearns' mortgage securities concentration.

**Recommendation 3:**

The Division of Trading and Markets should ensure that it adequately incorporates a firm's concentration of securities into the Consolidated Supervised Entity (CSE) program's assessment of a firm's risk management systems (*e.g.*, internal controls, models, etc.) and more aggressively prompts CSE firms to take appropriate actions to mitigate such risks.

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<sup>100</sup> Source: an internal TM memorandum dated November 15, 2004.

<sup>101</sup> Source: an internal TM memorandum dated March 2005. TM stated that it verified that Bear Stearns' senior management had granted temporary authority to exceed these limits.

<sup>102</sup> Source: Basel Committee on Banking Supervision: International Convergence on Capital Measurement and Capital Standards, June 2006, paragraph 777. < <http://www.bis.org/publ/bcbs128.pdf> >.

## Leverage

Prior to the adoption of the rule amendments which created the CSE program, the broker-dealers affiliated with the CSE firms were required to either maintain:

- A debt to net capital ratio of less than 15 to 1 (after their first year of operation); or
- Have net capital not less than the greater of \$250,000 or two percent of aggregate debit items computed in accordance with the *Formula for Determination of Reserve Requirements for Broker-Dealers*.

However, the CSE program did not require a leverage ratio limit for the CSE firms. As a result, Bear Stearns was highly leveraged, with a gross leverage ratio of approximately 33 to 1 prior to its collapse.<sup>103</sup> Leverage can affect liquidity risk. For instance:

- The Counterparty Risk Management Policy Group (in June 1999)<sup>104</sup> stated:  
The link between leverage and funding liquidity risk is relatively straightforward: leverage amplifies funding liquidity risk...
- The President's Working Group (PWG) on Financial Markets<sup>105</sup> Report (in April 1999) on Long-Term Capital Management (LTCM) stated:<sup>106</sup>  
In addition, the liquidity risk of a hedge fund interacts with and is magnified by leverage, most clearly in distressed market circumstances.<sup>107</sup>

Although TM has maintained that leverage is not directly related to liquidity, it is clear that if a firm experiences a lack of confidence, its liquidity can be adversely affected and that leverage can influence confidence levels. Thus, it is entirely

<sup>103</sup> There are many definitions of leverage. Other firms also had high gross leverage amounts (*i.e.*, assets divided by stockholders' equity). See Appendix VI.

<sup>104</sup> "In January 1999, a group of 12 major, internationally active commercial and investment banks announced the formation of a Counterparty Risk Management Policy Group (CRMPG). The objective of the Policy Group, whose formation was endorsed by Chairman Greenspan [then Federal Reserve Chairman], Chairman Levitt [then Commission Chairman] and Secretary Rubin [then Secretary of the U.S. Department of Treasury], has been to promote enhanced strong practices in counterparty credit and market risk management." *Improving Counterparty Risk Management Policies*, Counterparty Risk Management Policy Group 2 (June 1999).

<sup>105</sup> In 1988, Executive Order 12631 established the President's Working Group (PWG). The PWG's purpose is "...enhancing the integrity, efficiency, orderliness, and competitiveness of our nations financial markets and maintaining investor confidence..." The PWG members are: the Chairmen of the Commission, the Commodities Futures Trading Commission, and the Federal Reserve; and the Secretary of the U.S. Department of Treasury.

<sup>106</sup> Long-Term Capital Management (LTCM) was a very large U.S. hedge fund that collapsed in 1998. However, apparently some counterparties treated LTCM as an investment bank and not a hedge fund.

<sup>107</sup> Although, Bear Stearns was not a hedge fund, we believe that the concept of leverage's relationship to liquidity still applies, especially since apparently some counterparties treated LTCM as an investment bank and not a hedge fund.

possible that Bear Stearns' high leverage contributed to a lack of confidence in the firm (including unsubstantiated rumors) which had an impact on its collapse. In fact, TM believed in early 2006 that Bear Stearns was still managing its balance sheet at quarter end, a practice which suggests that Bear Stearns was aware that its leverage ratios affected market perceptions.<sup>108</sup> Although banking regulators have established a leverage ratio limit, the CSE program has not established a leverage ratio limit.<sup>109</sup> The adoption of leverage limits must be reassessed in light of the circumstances surrounding the Bear Stearns' collapse, especially since some individuals believe that this policy failure directly contributed to the current financial crisis.

**Recommendation 4:**

The Division of Trading and Markets, in consultation with the Board of Governors of the Federal Reserve System, should reassess the Consolidated Supervised Entity (CSE) program's policy regarding leverage ratio limits and make a determination as to whether, and under what circumstances, to impose leverage ratio limits on the CSEs.

**Bear Stearns' Model Review Process and Risk Management Staffing Were Inadequate in the Area of Mortgage Backed Securities**

Prior to Bear Stearns' approval as a CSE in November 2005, OCIE found that Bear Stearns did not periodically evaluate its VaR models,<sup>110</sup> nor did it timely update inputs to its VaR models. Further, OCIE found that Bear Stearns used outdated models that were more than ten years old to value mortgage derivatives and had limited documentation on how the models worked.<sup>111</sup> As a result, Bear Stearns' daily VaR amounts could have been based on obsolete data. It was critically imperative for Bear Stearns' risk managers to review mortgage models because its primary business dealt with buying and selling mortgage-backed securities.

During the initial CSE application, TM staff raised concerns about model review scope regarding mortgages and other cash products. TM stated:

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<sup>108</sup> "(From a liquidity and funding perspective-it appears that both BS [Bear Stearns] and LB [Lehman Brothers] are still actively managing their balance sheets at quarter end, whereas this practice seems to have been mitigated substantially at MS [Morgan Stanley] and GS [Goldman Sachs Group, Inc.] based on the quarterly discussions with MS and GS Treasury departments)." Source: TM credit meeting memorandum with Bear Stearns dated December 2005.

<sup>109</sup> However, there are some fundamental differences between commercial and investment banks. For instance, unlike investment banks, commercial banks rely on customer deposits.

<sup>110</sup> "Value at Risk (VaR) is the maximum loss not exceeded with a given probability defined as the confidence level, over a given period of time." Source: [Wikipedia- The Free Encyclopedia](http://en.wikipedia.org/wiki/Value_at_risk). <[http://en.wikipedia.org/wiki/Value\\_at\\_risk](http://en.wikipedia.org/wiki/Value_at_risk)>.

<sup>111</sup> OCIE internal memorandum to Jeffrey M. Farber (Bear Stearns, Senior Managing Director), December 2 2005, page 8. Also see Finding 5.

We believe it would be highly desirable for Independent Model Review to carry out detailed reviews of models in the mortgage area.<sup>112</sup>

At a meeting with TM on September 20, 2006, Bear Stearns' risk managers provided TM with a presentation concerning how its risk managers reviewed Bear Stearns' models to price and hedge various financial instruments. As a result of this presentation, TM concluded that Bear Stearns' model review process lacked coverage of mortgage-backed and other asset-backed securities, in part because the models were not used for pricing and in part because the sensitivities to various risks implied by the models did not reflect risk sensitivities consistent with price fluctuations in the market.<sup>113</sup> According to the OIG expert, this information is consistent with the interpretation that pricing at Bear Stearns was based more on looking at trading levels in the market than on looking at models. This information is also consistent with the interpretation that traders used their own models (perhaps empirically based) for hedging purposes and not the ones that the risk managers were reviewing. When markets are liquid and trading is active, market prices can be used to value assets accurately. In times of market stress, trading dries up and reliable price information is difficult to obtain. Models therefore become relatively more important than market price in times of market stress than in times when markets are liquid and trading actively. Such stressed circumstances force firms to rely more on models and less on markets for pricing and hedging purposes.

TM later learned that spikes in VaR resulted from disagreements between traders and risk managers concerning appropriate hedge ratios.<sup>114</sup> Traders often combine long and short positions together, using the short positions to hedge out some of the risks associated with long positions. For example, a trader might short a government bond to hedge the interest rate risk associated with a mortgage-backed security. To construct an appropriate hedge ratio, traders use information such as the sensitivity of the value of the assets to interest rate changes or interest rate spreads. At Bear Stearns, traders and risk managers sometimes disagreed concerning what these sensitivities were, and processes for handling these disagreements were built into the risk management process at Bear Stearns. A VaR model is intrinsically based on more information than a sensitivity of value to interest rate spread. A VaR model also incorporates an assumption about the ratio of spread changes in one asset to spread changes in another. A VaR model can therefore tell the trader an appropriate hedge ratio to use to reduce risks associated with fluctuations in spreads. At Bear Stearns, traders used hedge ratios that were consistent with the traders' own models even though the risk managers' VaR models indicated that different hedge ratios

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<sup>112</sup> Bear Stearns & Co. Inc. Consolidated Supervised Entity Market Risk Review, October 2005, page 44.

<sup>113</sup> Source: TM's internal Model Review Update memorandum dated September 20, 2006.

<sup>114</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated December 2006 and follow up notes memorandum dated February 9, 2007 and February 21, 2007.

would have been more appropriate.<sup>115</sup> Since VaR measures of risk reported to TM are based on the risk managers' models and not the traders' models, the reported VaR numbers suggested a risk that was different than the risks the traders thought they were bearing. The fact that VaR spiked as a result of these disagreements also raises the question of whether VaR risk measures were taken seriously enough by Bear Stearns' traders.

The OIG expert believes that interest rate and spread sensitivities were actively used as part of the discussion between risk managers and traders at Bear Stearns, but the OIG expert did not see evidence in TM memoranda that the additional modeling assumptions incorporated into VaR models added much to these discussions.

TM believed that Model Review at Bear Stearns was more of a support function and was less formalized than at other CSE firms.<sup>116</sup> Model validation personnel, modelers, and traders all sat together at the same desk.<sup>117</sup> According to the OIG expert, sitting together at the same desk has the potential advantage of facilitating communication among risk managers and traders but has the potential disadvantage of reducing the independence of the risk management function from the trader function, in both fact and appearance.

In 2006, the expertise of Bear Stearns' risk managers was focused on pricing exotic derivatives and validating derivatives models. At the same time, Bear Stearns' business was becoming increasingly concentrated in mortgage securities, an area in which its model review still needed much work. The OIG expert concluded that, at this time, the risk managers at Bear Stearns did not have the skill sets that best matched Bear Stearns' business model.

For instance, TM's discussions with risk managers in 2005 and 2006 indicated that Bear Stearns' pricing models for mortgages focused heavily on prepayment risks but TM's internal memoranda rarely mentioned how the models dealt with default risks.<sup>118</sup> Given the risk managers' lack of expertise in mortgages, it would have been difficult for risk managers at Bear Stearns to advocate a bigger focus on default risk in its mortgage models.

There was also turnover of Bear Stearns' risk management personnel at critical times. Bear Stearns' head of model validation resigned around March 2007, precisely when the subprime crisis was beginning to hit and the first large write-downs were being taken.<sup>119</sup> At exactly this point in time, Bear Stearns had a tremendous need to rethink its mortgage models and lacked key senior risk

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<sup>115</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated December 2006 and follow up notes memorandum dated February 9, 2007 and February 21, 2007.

<sup>116</sup> Source: TM's internal Model Review Update memorandum dated September 20, 2006.

<sup>117</sup> Source: TM's internal Model Review Update memorandum dated September 20, 2006.

<sup>118</sup> Source: TM's internal credit meeting memoranda with Bear Stearns dated February 2006 and September 2004.

<sup>119</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated February 2007.



modelers to engage in this process. As a result, mortgage modeling by risk managers floundered for many months.<sup>120</sup> According to the OIG expert, this disarray in risk management tended to give trading desks more power over risk managers. In fact, there are indications (in internal TM memoranda from later monthly meetings between TM and Bear Stearns) that the risk manager who left had difficulty communicating with senior managers in a productive manner.<sup>121</sup> In the opinion of the OIG expert, difficulties in communication are a potential red flag indicating that a risk manager could be telling the traders to take on less risk than they would otherwise choose to do (*i.e.*, information that the traders would presumably not want to hear). This risk manager's eventual replacement was described as having some trading experience and therefore a potentially better skill set for communicating with trading desks.<sup>122</sup>

When a new senior risk manager (with expertise in mortgages) arrived in summer of 2007, TM was aware that there was a great need for risk management to work on mortgage models.<sup>123</sup> Instead, TM learned that the risk management process was operating in crisis mode, dealing with numerous issues related to price verification, markdowns, and disputes over collateral valuations with counterparties.<sup>124</sup> TM was aware that the model review function was typically understaffed at Bear Stearns for much of 2007.<sup>125</sup> As a result, the OIG expert concluded that the reviews of mortgage models that should have taken place before the subprime crisis erupted in February 2007 appears to have never occurred, in the sense that it was still a work in progress when Bear Stearns collapsed in March 2008.

To summarize, TM was aware that risk management of mortgages at Bear Stearns had numerous shortcomings, including lack of expertise by risk managers in mortgage-backed securities at various times; lack of timely formal review of mortgage models; persistent understaffing; a proximity of risk managers to traders suggesting lack of independence; turnover of key personnel during times of crisis; and an inability or unwillingness to update models quickly enough to keep up with changing circumstances. In 2006, TM missed an opportunity to push Bear Stearns aggressively to add expertise in mortgage modeling to the risk management staff, to review mortgage models in a timely manner, to add incorporate default rates into mortgage modeling, and to make sure that mortgage risk management could function efficiently in a stressed environment.

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<sup>120</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated April 2007, and Model Review Update memorandum involving Bear Stearns dated December 19, 2007.

<sup>121</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated March 2007.

<sup>122</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated March 2007.

<sup>123</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated July 2007.

<sup>124</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated July 2007.

<sup>125</sup> Source: TM's internal Model Review Update memorandum involving Bear Stearns dated December 19, 2007.

**Recommendation 5:**

The Division of Trading and Markets (TM) should ensure that: (1) the Consolidated Supervised Entity (CSE) firms have specific criteria for reviewing and approving models used for pricing and risk management, (2) the review and approval process conducted by the CSE firms is performed in an independent manner by the CSEs' risk management staff, (3) each CSE firms' model review and approval process takes place in a thorough and timely manner, and (4) impose limits on risk taking by firms in areas where TM determines that risk management is not adequate.

**Risk Scenarios**

When Bear Stearns applied to be a CSE, TM reviewed the independent risk management function at Bear Stearns in 2005.<sup>126</sup> In addition to VaR, Bear Stearns used stress scenarios to capture risks associated with history-based and hypothetical scenarios. TM reviewed a sample of a "Bear Stearns Scenario Summary Report." The report contains nine history-based scenarios which had been implemented (including the 1987 stock market crash and the 1998 LTCM crisis), eight hypothetical scenarios which had been implemented (including shocks to interest rates and interest rate spreads), and six additional proposed hypothetical scenarios, which appear not to have been implemented when Bear Stearns became a CSE.<sup>127</sup> Most of these proposed scenarios related to the market for residential mortgages. For example, the proposed scenarios contemplated shocking the credit spreads for both high grade and high yield mortgage-backed securities separately.

Bear Stearns' VaR models did not capture risks associated with credit spread widening of non-agency mortgages that are prime or near-prime (Alt-A).<sup>128</sup> Thus, the residential mortgage stress tests were potentially beneficial in that they quantified potential risks not otherwise captured. The OIG expert did not find documentary evidence indicating that these scenarios were actually implemented or subsequently discussed with TM until 2007. Furthermore, the OIG expert believes that meaningful implementation of high grade and high yield mortgage credit spread scenarios requires both a measure of sensitivity of mortgage values to yield spreads as well as a model of how fundamental mortgage credit risk factors make yield spreads fluctuate. These fundamental factors include housing price appreciation, consumer credit scores, patterns of delinquency rates, and potentially other data. These fundamental factors do not seem to have been incorporated into Bear Stearns' models at the time Bear Stearns became a CSE.

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<sup>126</sup> Source: TM Internal memorandum Bear Stearns & Co. Inc. Consolidated Supervised Entity Market Risk Review, October 2005, Appendix D: Scenario Analysis Summary Report.

<sup>127</sup> The scenario names are "MBS Underp. (Prepay Risk)," "HG MBS/ABS Underp. (Credit Risk)," "HY MBS/ABS Underp. (Credit Risk)," "Volatility Spike," "FNMA Problems," and "FHLMC Problems."

<sup>128</sup> Source: TM Internal memorandum Bear Stearns & Co. Inc. Consolidated Supervised Entity Market Risk Review, October 2005, Appendix D: Scenario Analysis Summary Report.

The presence of the proposed mortgage scenarios in the materials TM reviewed in 2005 indicates that both TM and Bear Stearns knew that incorporating these features into Bear Stearns' risk management was important for effective risk management. The absence of their implementation suggests that Bear Stearns did not have in place in 2005 the risk management technology needed to implement the scenarios in a meaningful manner.

According to internal TM memoranda, TM discussed several different risk scenarios with Bear Stearns' management. The most commonly-discussed stress scenarios mentioned in TM memoranda include the 1987 stock market crash, the 1998 collapse of LTCM and the 9/11 terrorist attacks, because these crisis scenarios resulted in the greatest potential losses. The OIG expert concluded based on a review of internal TM memoranda, that Bear Stearns' risk managers analyzed these risks carefully. Additionally, TM collected a great deal of information on other aspects of risk management, including the organizational structure of the risk management process, model verification, and price verification.

The OIG expert however, also concluded that the internal TM memoranda provide no discussion of the most serious forward-looking risk scenario that Bear Stearns might face, which was a complete meltdown of mortgage market liquidity accompanied by fundamental deterioration in the mortgages themselves, resulting from falling housing prices.

In April 2006 through June 2006, Bear Stearns briefed TM multiple times on problems faced by a United Kingdom mortgage originator subsidiary.<sup>129</sup> As a result of extremely poor performance of collateral, due to weak underwriting standards, Bear Stearns took losses associated with security originations by this subsidiary. In fact, an internal memorandum to TM's Division Director quoted the text of two newspaper articles chronicling this subsidiary's inability to meet its interest payments.<sup>130</sup> At the time of the news articles, Bear Stearns told TM that it was holding \$1.5 billion in unsecuritized whole loans and commitments from this subsidiary, and TM believed that Bear Stearns would be unable to sell this commitment due to the negative publicity surrounding this subsidiary.<sup>131</sup> In focusing on Bear Stearns' problems with this subsidiary, the OIG expert believes that in 2006, TM identified precisely the types of risks that evolved into the subprime crisis in the U.S. less than one year later. Yet, TM did not exert influence over Bear Stearns to use this experience to add a meltdown of the subprime market to its risk scenarios. Moreover, TM did not use this event to exert influence on Bear Stearns to reduce its exposure to subprime loans, as previously discussed on page 17.

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<sup>129</sup> Source: TM's internal credit meeting memoranda with Bear Stearns dated April 2006, May 2006, and June 2006.

<sup>130</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated June 2006.

<sup>131</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated June 2006.

In terms of large drops in market prices and large asset write-downs on mortgage-backed securities, the subprime crisis began to affect the U.S. around December 2006. The drop in prices tended to hit residuals from mortgage securitizations first. When mortgages or other assets are securitized, the tranches, which have the highest certainty of payment, typically receive "AAA" ratings. The tranches with lowest credit quality are called "residuals," and these tranches bear credit losses before the higher rated tranches bear credit losses. In February 2007, Bear Stearns told TM that it had written \$300 million of residuals down by \$58 million in January 2007, after writing the residuals down by \$25 million in December 2006.<sup>132</sup> Additional write-downs the following month brought total losses on second lien inventory to \$168 million and total losses on residential mortgage backed securities and structured products to \$240 million.<sup>133</sup> The write-downs during this quarter were mostly on residuals backed by second lien loans,<sup>134</sup> Alt-A loans,<sup>135</sup> and subprime mortgages.<sup>136</sup> TM described the residual write-downs as a meltdown that was worse than what Bear Stearns could have predicted over a year before Bear Stearns collapsed.<sup>137</sup>

Prior to these write-downs, in the fall of 2006, TM had focused on the risks associated with residuals and asked for detailed breakdowns of residuals by age and asset type. Bear Stearns' management told TM that it was moving away from holding residuals in its portfolio, was attempting to sell aging residuals, and was aware that its residuals on second lien mortgage securitizations were very risky.<sup>138</sup> In the months prior to Bear Stearns' taking these losses, Bear Stearns briefed TM on the rising delinquencies on subprime mortgages.<sup>139</sup>

The OIG expert believes that the greater risk was that the mortgage market would deteriorate further, with losses spreading from sub-prime loans to Alt-A loans and even to higher rated agency securities.<sup>140</sup> In fact, this scenario did unfold. TM discussed with Bear Stearns the market's heavy reliance on ratings agencies and the risks associated with ratings downgrades.<sup>141</sup> However, TM did not appear to have sufficiently encouraged Bear Stearns to incorporate into its risk management forward-looking risk scenarios based on risks identified and discussed during the regular monthly meetings between TM and Bear Stearns. Such scenarios could have included the consequences of much higher delinquencies on subprime and Alt-A mortgages, the consequences of rating

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<sup>132</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated January 2007.

<sup>133</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated February 2007.

<sup>134</sup> Second lien loans are home equity loans.

<sup>135</sup> An Alt-A mortgage is considered riskier than a "prime" mortgage, but not as risky as "subprime" mortgage.

<sup>136</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated January 2007.

<sup>137</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated January 2007.

<sup>138</sup> Source: TM's internal credit meeting memoranda with Bear Stearns dated August 2006 and September 2006.

<sup>139</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated November 2006.

<sup>140</sup> Source: TM's internal credit meeting memoranda with Bear Stearns dated January 2007 and February 2007.

<sup>141</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated December 2006.

downgrades on mortgage-backed securities, contagion and loss of liquidity from losses on mortgage-backed securities. By July 2007, deterioration of mortgages had spread to highly rated securities such as AAA paper backed by Alt-A mortgages, and Bear Stearns reported \$570 million in losses for the month.<sup>142</sup>

Towards the end of 2007, Bear Stearns incorporated measures to reflect house price appreciation or depreciation into its mortgage models. It also developed a housing led recession scenario which it could incorporate into risk management and use for hedging purposes. By this time, Bear Stearns had large inventories of mortgage related assets, which had lost both their value and their liquidity. Since it was difficult for Bear Stearns to reduce its inventory by selling assets, this scenario helped Bear Stearns focus its attention on ways to hedge its mortgage risk by using more liquid instruments.

It is not the purpose of this discussion to claim that Bear Stearns' use of scenario analysis was better or worse than other CSE firms. TM asserts that Bear Stearns' use of scenario analysis was consistent with industry practices and the entire banking sector failed to anticipate the magnitude and scope of the housing decline that is still ongoing.

**Recommendation 6:**

The Division of Trading and Markets should be more skeptical of Consolidated Supervised Entity firms risk models and work with regulated firms to help them develop additional stress scenarios that may or may not have not have been contemplated as part of the prudential regulation process.

**Recommendation 7:**

The Division of Trading and Markets (TM) should be involved in formulating action plans for a variety of stress or disaster scenarios, even if the plans are informal, including plans for every stress scenario that the Consolidated Supervised Entity (CSE) firms use in risk management, as well as plans for scenarios that TM believes might happen but are not incorporated into CSE firms' risk management.

**Non-compliance with Basel II**

Mark Disputes

The subprime mortgage crisis began to affect the U.S. economy around December 2006. As the subprime crisis continued into the summer of 2007, TM learned that mark disputes were becoming more common.<sup>143</sup> A mark dispute can occur when two parties to a derivatives transaction, such as a swap, disagree over the value of the derivative. A mark dispute can also occur in a repurchase agreement (repo) transaction, when the borrower and the lender disagree over the value of the collateral. Mark disputes can lead the two parties

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<sup>142</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated July 2007.

<sup>143</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated July 2007.

to a swap or financing transaction to each make margin calls on the other. During July 2007, Bear Stearns told TM that there were two large dealers with whom mark disputes were in excess of \$100 million each.<sup>144</sup> Bear Stearns had thousands of trades with each of these two dealers. TM says that mark disputes are an unavoidable issue faced by all dealers (particularly when markets for underliers become less liquid), and the total disputed numbers at Bear Stearns are much smaller than at other institutions.

By March 2008, Bear Stearns' mark disputes involved even larger amounts. For example, on March 12, 2008, TM was told that Bear Stearns paid out \$1.1 billion in disputes to numerous counterparties in order to squelch rumors that Bear Stearns could not meet its margin calls.<sup>145</sup>

There are indications in the TM memoranda that Bear Stearns tended to use the traders' more generous marks for profit and loss purposes, even when Bear Stearns conceded to the counterparty for collateral valuation purposes.<sup>146</sup> This practice allows two traders at different firms to record a gain at the expense of the other, despite the fact that the zero-sum nature of trading requires the net gain to be zero. One particularly large mark dispute, discussed in multiple meetings, involved Bear Stearns and another CSE. It is inconsistent with the spirit of Basel II for two firms to use a mark dispute as an occasion to increase their combined capital, as would occur when both parties to a trade book profit at the expense of the other simply because they each mark positions favorably for themselves. While TM memoranda indicate that TM had several discussions with Bear Stearns' risk managers about this particular mark dispute, the OIG expert found no evidence from reviewing internal TM memoranda that TM encouraged the CSE firms to adopt mutually consistent marking practices that avoid the use of collateral disputes to create apparent capital in a manner inconsistent with Basel II. Since mark disputes tend to occur on illiquid positions that are hard to value, conservative valuation adjustments consistent with Basel II<sup>147</sup> should theoretically result in a situation where the long side of a trade is carried at a lower value than the short side; i.e., when netted across two firms with offsetting long and short positions, appropriately conservative valuations should appear to reduce capital, not increase it.

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<sup>144</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated July 2007.

<sup>145</sup> Source: TM internal memorandum from March 2008 (filename: Bear Stearns March Notes - SMS.doc).

<sup>146</sup> Source: TM's credit meeting memorandum with Bear Stearns dated March 2007, states: "We also asked how helpful the counterparty collateral process was for informing the price verification process. Kan said the collateral process does not tend to lead to changes in marks for P/L purposes – suggesting it was not helpful – but Mike Alix [Chief Risk Officer, Bear Stearns] said it could be helpful not sure if the mortgage guys actually gave a straight answer."

<sup>147</sup> Source: Basel Committee on Banking Supervision: International Convergence on Capital Measurement and Capital Standards, June 2006, paragraph 700. < <http://www.bis.org/publ/bcbs128.pdf>>.

**Recommendation 8:**

The Division of Trading and Markets should take steps to ensure that mark disputes do not provide an occasion for Consolidated Supervised Entity firms to inflate the combined capital of two firms by using inconsistent marks.

*Inconsistent VaR Numbers*

According to an internal TM memorandum, there were occasions when Bear Stearns' risk managers had difficulty explaining changes in VaR numbers from one month to the next.<sup>148</sup> For example, when markdowns on assets occurred, Bear Stearns' risk managers had difficulty explaining whether the markdowns were a delayed response to market moves resulting in changes in VaR risk factors or updates based on asset specific information (such as delinquency rates on individual assets).

In some cases, Bear Stearns' risk managers had difficulty explaining how firmwide VaR numbers were related to desk-specific VaR numbers. The OIG expert believes that this occurred because each of Bear Stearns' trading desks evaluated profits and risks individually, as opposed to relying on one overall firm-wide approach. On some occasions, Bear Stearns' several trading desks had opposite positions in various instruments (e.g., some desks were long sub-prime while other desks were short sub-prime), and Bear Stearns used VaR numbers more for regulatory reporting than for internal risk management. This inconsistency between use of VaR for internal and regulatory reporting purposes does not comport with the spirit of Basel II and makes it harder for TM to understand what is going on inside the firm. TM encouraged Bear Stearns to do a better job of presenting risks in a manner that made it easier to understand the relationship between firm-wide desk-level risks. Bear Stearns' risk management was working on improved reporting, perhaps influenced by TM's encouragement.

**Recommendation 9:**

The Division of Trading and Markets should encourage the Consolidated Supervised Entity (CSE) firms to present VaR and other risk management data in a useful manner, which is consistent with how the CSE firms use the information internally and which allows risk factors to be applied consistently to individual desks.

*Bear Stearns' Capital Requirements for Illiquid Assets and Stressed Repos Require Careful Oversight.*

As the subprime crisis worsened in June 2007, the market began to freeze up and formerly liquid assets lost much of their liquidity. Bear Stearns told TM that it found it difficult to find ways to establish objective market values for assets as they became more thinly traded and therefore, less liquid. TM stated that, in some instances, TM required a full deduction for certain illiquid assets, such as mortgage residuals. Since the decline in liquidity of many mortgage-related

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<sup>148</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated May 2007.

assets was so unprecedented, and the decline in liquidity increased the difficulties associated with valuing such illiquid assets, it would have been prudent for TM to consider expanding the list of assets that require a full deduction from capital. The OIG expert was unable to find documentary evidence that TM considered expanding the list of assets that required a 100% capital deduction.

When the Basel Standard is operating correctly, firms take markdowns on the value of trading book assets as the value of the assets decline. When market illiquidity increases and assets become more difficult to value, these markdowns should include valuation adjustments which not only take account of declining market values but also add an element of conservatism based on widening bid-ask spreads and the high costs that would be incurred by a firm to liquidate its assets in a stressed environment.<sup>149</sup> These markdowns result in a decline in Tier 1 capital.

At times of market stress, when banks often need to take large markdowns, raising additional Tier 1 capital is often very expensive, due to factors such as a bank's falling stock price and negative signaling concerns, which could cause a bank's stock price to fall even further. In such circumstances, banks have a perverse incentive (associated with what is called "moral hazard") to postpone taking markdowns that would require the banks to raise additional capital. As an alternative to taking markdowns while continuing to hold assets whose value is questionable, banks have an incentive to consider selling such assets into the market. When selling an asset, Tier 1 capital is reduced by the amount of losses on the sale, but capital requirements are also reduced by removing the asset from the bank's portfolio. A bank looking to improve its Basel capital ratios by selling assets therefore has a perverse incentive not to sell assets that have modest capital requirements relative to the markdowns the banks should have taken but has not yet taken. This perverse incentive tends to amplify the tendency for markets to freeze up and become illiquid by reducing trading volume that would otherwise occur as banks sell losing positions into the market. On the one hand, these perverse incentives are mitigated to the extent that capital requirements on such assets are high and valuations are appropriately conservative. For assets that face a 100% capital haircut, for example, the bank gains no improvement in its capital ratios by avoiding taking a markdown, and the bank increases its capital by the proceeds of any asset sales. On the other hand, these perverse incentives are worsened to the extent that supervisors allow banks to avoid marking assets down quickly enough, to avoid taking appropriate valuation adjustments in a timely manner, or to understate assets' risks.

As the subprime crisis worsened, numerous Bear Stearns' repo counterparties, such as hedge funds with positions in mortgage related assets, suffered losses

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<sup>149</sup> Source: Basel Committee on Banking Supervision: International Convergence on Capital Measurement and Capital Standards, June 2006, paragraph 700. < <http://www.bis.org/publ/bcbs128.pdf>>.



and demands for redemptions. Some of these hedge funds became financially distressed. This led to discussions between TM and Bear Stearns concerning what deductions from capital were appropriate for a financially stressed hedge fund repo counterparty.<sup>150</sup> Consistency with the spirit of Basel II requires that the capital for a stressed repo counterparty (with no assets other than the collateral it has posted) be at least as great as the capital requirement Bear Stearns would face if it purchased the collateral for the amount owed on the repo transaction. The OIG expert believes that internal TM memoranda suggest that Bear Stearns may have been taking a smaller capital charge than Basel II requires. In addition, internal TM memoranda do not indicate that TM pressured Bear Stearns to take more aggressive capital charges on stressed repos.

Lastly, BSAM's "High Grade" hedge fund became a very large, stressed repo counterparty to Bear Stearns during the summer of 2007.<sup>151</sup> As of June 2007, Bear Stearns loaned \$1.6 billion to BSAM's "high grade" fund. The loan was collateralized with assets estimated to be worth \$1.7 to \$2 billion. By the end of June 2007, asset sales had reduced the amount loaned to the fund down to \$1.345 billion, but the value of the remaining collateral had deteriorated to a level very close to the value of the loan.<sup>152</sup> The BSAM "High Grade" hedge fund evidently had no assets other than the collateral Bear Stearns already held. Although the BSAM investors may have benefited to some extent from increases in the value of the collateral, Bear Stearns bore all risks associated with the downside. Since Bear Stearns bore all downside risks, sound risk management (consistent with Basel II) requires that the impact on Bear Stearns' capital associated with these repos should have been at least as great as the impact Bear Stearns would incur if it held the assets in its own trading book at the end of June 2007.

According to the OIG expert, a stressed repo is conceptually similar to a portfolio with a call option written against it, where the portfolio is the repo collateral and the call option is the upside gains to the stressed counterparty. Such a stressed repo is worth less than the portfolio itself, since the call option might have some value. In addition, the value of this stressed repo should have reflected the possibility that Bear Stearns might not benefit fully from potential upside gains in the value of the collateral. Furthermore, to the extent that the \$1.345 billion in collateral was illiquid and would take time to liquidate, Bear Stearns should have valued the collateral conservatively, reflecting appropriate valuation adjustments.

TM memoranda summarizing discussions with Bear Stearns' risk managers suggest that the capital charge incurred by Bear Stearns at the end of June 2007 was far less than the capital charge consistent with sound risk management. TM memoranda indicate that by the end of July 2007, "Bear Stearns effectively took

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<sup>150</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated June 2007.

<sup>151</sup> Source: TM's internal credit meeting memoranda with Bear Stearns dated May 2007, June 2007, and July 2007.

<sup>152</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated June 2007.

the collateral onto its own balance sheet while putting in place agreements that allow fund investors to enjoy some of the upside should (contrary to expectations) the value of the collateral rise.<sup>153</sup> This arrangement is similar to a portfolio with a call option written against it.

The OIG expert did not find any evidence suggesting that TM exerted influence on Bear Stearns to take significantly larger capital charges in conjunction with the BSAM financing than would have been appropriate if the repo were not stressed. For instance, according to TM internal documentation on July 5, 2007:

[The] Enhanced [fund] is in the process of liquidating its remaining positions in an orderly manner while Bear Stearns has stepped in to assume the secured funding obligations of other creditors to the High Grade fund. Currently, none of the CSE firms have more than de minimis exposure, net of collateral, to either fund. However, they are reviewing their policies regarding setting "haircuts" on less liquid positions that are financed on a secured basis.<sup>154</sup>

TM staff could have used much tougher language to describe (to senior TM management) the very risky situation in which Bear Stearns had put itself and exerted influence over Bear Stearns accordingly. For example, TM staff could have stated that Bear Stearns' financing of the High Grade fund appeared to have allowed Bear Stearns to delay taking a huge hit to its capital, as required by Basel II.

Bear Stearns' financing of the BSAM funds is conceptually similar to implicit support. According to Basel II, "Implicit support arises when a bank provides support to a securitization in excess of its predetermined contractual obligation."<sup>155</sup> Although the BSAM funds are not themselves, literal securitizations, the funds invested in securitizations, and Bear Stearns' financing of the BSAM funds is a form of support in excess of Bear Stearns' contractual obligations to the funds. The repo structure created the potential for Bear Stearns to overstate the amount of risk borne by BSAM and understate its own exposure; as a result, Bear Stearns' capital calculation would understate its true risk.<sup>156</sup> Basel II also requires that "When a bank has been found to provide implicit support to a securitization, it will be required to hold capital against all of the underlying exposures associated with the structure as if they had not been securitized."<sup>157</sup> In the opinion of the OIG expert, it would have been appropriate

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<sup>153</sup> Source: TM's internal monthly staff memorandum to TM Division Director dated August 3, 2007.

<sup>154</sup> Source: TM's internal monthly staff memorandum to TM Division Director dated July 5, 2007.

<sup>155</sup> Source: Basel Committee on Banking Supervision: International Convergence on Capital Measurement and Capital Standards, June 2006, paragraph 551. <<http://www.bis.org/publ/bcbs128.pdf>>.

<sup>156</sup> Source: Basel Committee on Banking Supervision: International Convergence on Capital Measurement and Capital Standards, June 2006, paragraph 791. <<http://www.bis.org/publ/bcbs128.pdf>>.

<sup>157</sup> Source: Basel Committee on Banking Supervision: International Convergence on Capital Measurement and Capital Standards, June 2006, paragraph 792. <<http://www.bis.org/publ/bcbs128.pdf>>.

for TM to have treated the BSAM financing in a manner parallel to the way in which Basel II mandates that implicit support be treated.

In fact, Bear Stearns eventually acquired much of the remaining portfolio and wrote its value down by \$500 million in the fall of 2007.<sup>158</sup>

**Recommendation 10:**

The Division of Trading and Markets should ensure that the Consolidated Supervised Entity take appropriate valuation deductions for illiquid, hard-to-value assets and appropriate capital deductions for stressed repos, especially stressed repos where illiquid securities are posted as collateral.

**Tolerance for Risk**

TM's oversight of the CSE firms did not include assessing the risk tolerance (e.g., concentration of assets) of the CSEs' Boards of Directors and other senior management (e.g., CEO). In fact, TM staff never contacted these individuals about any matters relating to risk tolerance at any of the CSE firms, including Bear Stearns prior to its collapse.

We conclude based on our research that discussing risk management practices and risk tolerance with the CSEs' Boards of Directors is a prudent oversight procedure.<sup>159</sup> This type of assessment would assist TM staff to evaluate governance issues in the CSE firms. For example, in the case of Bear Stearns, an assessment could have been useful when there was evidence that the staff kept increasing the firm's exposure to mortgage securities. TM staff could also assess whether firms are inappropriately increasing leverage to help meet a revenue level that is tied to compensation that is provided to the CSEs' senior officers.<sup>160</sup>

**Recommendation 11:**

The Division of Trading and Markets (TM), in consultation with the Chairman's Office, should discuss risk tolerance with the Board of Directors and senior management of each Consolidated Supervised Entity (CSE) firm to better understand whether the actions of CSE firm staff are consistent with the desires of the Board of Directors and senior management. This information would

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<sup>158</sup> Source: TM's internal credit meeting memorandum with Bear Stearns dated October 2007.

<sup>159</sup> Sources for this information include:

- *Risk Management and its Implications for Systemic Risk* Before the U.S. Senate Subcommittee on Securities, Insurance, and Investment Committee on Banking, Housing, and Urban Affairs, 110<sup>th</sup> Cong. (June 19, 2008) (statement of Erik Sirri Director of TM, Commission);
- The Comptroller of the Currency. Liquidity and Funds Management Manual, February 2001, page 27; and
- The Counterparty Risk Management Policy Group. Containing Systemic Risk: The Road to Reform. August 6, 2008, page 18.

<sup>160</sup> TM stated that the Chairman and the TM Director have recently begun having discussions with these senior CSE personnel about undertaking this type of assessment.

enable TM to better assess the effectiveness of the firms' risk management systems.

### **Finding 3: TM, Without Explicit Authority, Allowed The CSE Firms' Internal Auditors To Perform Critical Work**

TM, without explicit authority, allowed the firms' internal auditors to perform critical work involving the risk management control systems. As a result, there are significant questions as to whether the work that TM relied upon in fulfilling its oversight role was as thorough or meaningful as the Commission intended in approving the rule amendments.

The CSE firms are required by the rule amendments which created the CSE program (see 17 CFR §240.15c3-1g(b)(1)(iii)(B)) to have their external auditors report<sup>161</sup> on the firms' risk management control systems. This review is critical because TM designed the CSE program to focus on a firm's risk management systems (e.g., internal controls, models) and their financial condition (e.g., compliance with capital and liquidity requirements), which was to be the focus of the external auditors' work. However, after the Commission approved the rule, TM decided that the firms' internal auditors could perform this critical work, instead of the external auditors.

We reviewed the delegations of authority from the Commission to TM and found no explicit authority for TM to approve this change. In addition to the apparent lack of TM's legal authority, there are serious questions about the wisdom of this decision. The rule's requirement that external auditors perform the risk management work helps to ensure the independence and quality of this critical audit work. The external auditors' work is more strictly regulated as the Public Company Accounting Oversight Board (PCAOB) regulates external auditors.<sup>162</sup>

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<sup>161</sup> The report is referred to in the rule as the "Accountant's Report on Internal Risk Management Control System."

<sup>162</sup> The Sarbanes-Oxley Act of 2002 (SOX), Public Law No. 107-204, was enacted in July 2002 in response to numerous financial statement accounting scandals involving public companies (e.g., Enron and WorldCom) and their auditors (e.g., Arthur Andersen). Among other reforms, SOX established the Public Company Accounting Oversight Board (PCAOB) as a nonprofit corporation. The PCAOB's statutory mission is "to oversee the audits of public companies that are subject to the securities laws, and related matters, in order to protect the interests of investors and further the public interest in the preparation of informative, accurate, and independent audit reports for companies the securities of which are sold to, and held by and for, public investors." (Section 101(a) of SOX, 15 U.S.C §7211(a)). SOX requires that accounting firms be registered with the PCAOB, if they "prepare or issue, or participate in the preparation or issuance of, any audit report with respect to any issuer" as defined in Section 3 of the Securities Exchange Act of 1934.

TM's own internal memorandum dated November 2006 noted significant deficiencies in Bear Stearns internal auditors' work, as follows:

The audits for Market Risk Management, Credit Risk Management, and Funding/Liquidity Risk Management are completed and the reports are in draft form. At this point it can be noted the [sic] there appears to be significant deficiencies in the coverage for the review of liquidity and funding risk management which will be a focal point of our discussions of scope expansion in the 2007 CSE audits.<sup>163</sup>  
[Emphasis added]

As a result of TM's decision to allow CSE firm's internal auditors to perform the work, there are significant questions as to whether this work that TM relied upon was as thorough or meaningful as the Commission intended in approving the rule.

**Recommendation 12:**

The Division of Trading and Markets should require compliance with the existing rule that requires external auditors to review the Consolidated Supervised Entity firms' risk management control systems or seek Commission approval in accordance with the Administrative Procedures Act<sup>164</sup> for this deviation from the current rule's requirement.

## **Finding 4: TM Did Not Review The Communications Strategy Component Of Bear Stearns' Contingency Funding Plan After The Collapse Of Two Of Its Managed Hedge Funds**

TM did not review the communications strategy component of Bear Stearns' Contingency Funding Plan (CFP) after two of its managed hedge funds collapsed in June 2007. Questions regarding Bear Stearns' effectiveness in communicating with its investors and the public were raised after the collapse of its hedge funds and again after the firm collapsed in March 2008.

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<sup>163</sup> Given the scope of our audit, we have no evidence linking these "significant deficiencies" with the cause of Bear Stearns' collapse.

<sup>164</sup> The Administrative Procedures Act (5 U.S.C. §500 *et. seq.*) sets forth the basic procedural requirements for agency rulemaking. It generally requires (1) publication of a notice of proposed rulemaking in the *Federal Register*, (2) opportunity for public participation in rulemaking by submission of written comments, and (3) publication of a final rule and accompanying statement of basis and purpose not less than 30 days before the rule's effective date.

TM reviewed Bear Stearns' CFP during its application process. The review included an assessment of its internal and external communications strategies. According to TM:

The goal of the contingency funding plan is to manage liquidity risk and communicate effectively with creditors, investors, and customers during a funding crisis.<sup>165</sup>

In June 2007, two of Bear Stearns' managed hedge funds collapsed. After the collapse, questions were raised about the lack of involvement by some of Bear Stearns senior management in handling the crisis. For instance, according to media reports, at an August conference call with investors, the conduct of a senior Bear Stearns official (*i.e.*, their lack of involvement in the telephone call) did not apparently help to restore confidence in the firm (which was the purpose of the meeting).

TM did not reassess the communication strategy component of Bear Stearns' CFP after the collapse of its hedge funds. Although there was contact between TM and Bear Stearns (about many issues) after the June 2007 collapse of its hedge funds, at no point did TM discuss Bear Stearns' communication strategy. This proved particularly problematic as questions were once again raised about some of Bear Stearns' management<sup>166</sup> regarding its handling of the crisis during the week of March 10, 2008.

Conversely, some individuals praised Lehman Brothers Holdings Inc. (Lehman Brothers) management for its handling of a crisis it previously experienced (*e.g.*, Lehman Brothers provided talking points to its traders to use with its trading partners). In fact, some of these individuals credited Lehman Brothers' management with helping to save the firm during/around the week of March 10, 2008, when Bear Stearns collapsed.<sup>167</sup>

It is undisputed that a firm's communication strategy can affect confidence levels in the firm. Bear Stearns' collapse illustrated the importance of confidence for an investment bank's survival.

**Recommendation 13:**

The Division of Trading and Markets should ensure that reviews of a firm's Contingency Funding Plan include an assessment of a Consolidated Supervised Entity firm's internal and external communication strategies.

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<sup>165</sup> Source: TM's internal Liquidity and Funding Risk Review manual (draft) dated March 3, 2004.

<sup>166</sup> We did not assess the performance of Bear Stearns' management during the collapse of the hedge funds or Bear Stearns.

<sup>167</sup> While Bear Stearns collapsed in March 2008, concerns about Lehman Brothers' survival began to circulate and on September 15, 2008, Lehman Brothers announced that it would file for bankruptcy.

## **Finding 5: TM's Monitoring Staff Do Not Adequately Track Material Issues**

TM's monitoring staff identify numerous issues involving internal risk management systems (e.g., the adequacy of CSE staffing levels in various departments, the functioning of the internal audit office, and the adequacy of documented policies and procedures) which require action by the CSEs and a resolution. However, TM does not adequately track the issues.

### **Develop a Formal Automated Tracking Process**

TM's monitoring staff does not have a formal process (e.g., automated) to track material issues to ensure that they are adequately resolved. The monitoring staff mainly identify issues through meetings with CSE firm staff. Currently, TM staff document some issues (e.g., the adequacy of the CSE staff levels in various departments, the functioning of the internal audit office and the adequacy of documented policies and procedures) in e-mails and organizes them by firm while other issues are documented in monthly memoranda to senior management (e.g., the Division Director).<sup>168</sup>

However, these current methods are not reliable and do not provide an audit trail. Our review of TM's documentation supports this assertion because we assessed twenty issues<sup>169</sup> that TM and OCIE identified with the CSE firms and we asked TM to explain how the issues were resolved. In some instances, the staff needed to perform detailed research in order to determine how the issues were eventually resolved. For example, OCIE staff found that Bear Stearns' Legal & Compliance group did not have any formal documentation that identified and assessed all of the applicable rules, laws, regulations, requirements and risks pertaining to the entire organization. TM could not readily tell us how and whether this issue was resolved. The follow-up of issues that OCIE identified is further discussed on page 38.

In a somewhat similar recent situation, the Government Accountability Office (GAO) criticized OCIE for its informal method of tracking recommendations regarding its Self Regulatory Organization (SRO) inspections. GAO stated:

OCIE's informal methods for tracking inspection recommendations contrast with the expectations set by federal internal control standards for ensuring that management has relevant, reliable, and

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<sup>168</sup> These monthly memoranda describe current significant issues that for instance, the staff identified during their meetings with CSE staff. However, the memoranda do not generally discuss the resolution of prior issues, as this is not the purpose of the memoranda. The memoranda are stored on a shared computer network.

<sup>169</sup> As discussed in the Scope and Methodology Section (see Appendix III).

timely information regarding key agency activities. These standards state that key information on agency operations should be recorded and communicated to management and others within the entity and within a time frame that enables management to carry out its internal control and other responsibilities.<sup>170</sup>

Given all the facts discussed above, TM cannot provide reasonable assurance (consistent with internal control standards) that issues are adequately resolved. Furthermore, we believe that the risk of an issue being overlooked (*i.e.*, not adequately resolved by a firm) increases if, the CSE program receives additional staff (as requested by Chairman Cox) because presumably more issues will be identified and require resolution.

**Recommendation 14:**

The Division of Trading and Markets should develop a formal automated process to track material issues identified by the monitoring staff to ensure that they are adequately resolved. At a minimum, the tracking system should provide the following information:

- The source of the issue;
- When the issue was identified;
- Who identified the issue;
- The current status of the issue (*e.g.*, new developments);
- When the issue was resolved; and
- How the issue was resolved.

**Follow-Up on Prior OCIE Findings**

In March 2007, Chairman Cox decided to transfer inspection responsibility from OCIE to TM (responsibility was transferred to TM in March 2007 for four of the five firms, and for the last firm (Morgan Stanley) following the completion of the ongoing OCIE exam of that firm in September 2007). This consolidated the oversight of the CSEs at the holding company level within TM.<sup>171</sup> OCIE continues to perform inspections of the CSEs' broker-dealers.

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<sup>170</sup> Source: GAO. Securities and Exchange Commission: Opportunities Exist to Improve Oversight of Self-Regulatory Organizations, Report 08-33, November 15, 2007.

<sup>171</sup> The transfer was in response to a GAO audit report (Financial Market Regulation: Agencies Engaged in Consolidated Supervision Can Strengthen Performance Measurement and Collaboration, Report 07-



While OCIE was responsible for conducting inspections at the holding company level, it identified numerous issues during its inspections performed as part of the CSE firms' application processes. TM stated that after Chairman Cox transferred the inspection authority from OCIE to TM, it decided not to follow-up on issues that OCIE identified because they did not view the OCIE issues as material and they assumed that these issues were OCIE's responsibility. OCIE stated that they did not follow-up (*i.e.*, conduct a new inspection) on the issues because it was no longer their responsibility once Chairman Cox transferred the inspections authority to TM.<sup>172</sup> Although TM stated that it had communicated with Bear Stearns about resolving this issue, TM did not make any efforts to verify Bear Stearns' assertions that it had addressed this issue. Further, OCIE provided TM with a list of eight issues related to Bear Stearns, that OCIE believed were particularly significant.<sup>173</sup> Two of these issues are discussed below.

As discussed in the Scope and Methodology section in Appendix IV, we performed testing on TM's tracking of material issues. Our testing found instances where TM's monitoring staff failed to ensure that issues identified by OCIE were adequately resolved.

We found that OCIE had identified significant issues that could have affected Bear Stearns' approval to become a CSE. One issue involved concerns that Bear Stearns was not sufficiently retaining its internal audit workpapers. Although TM stated that they had spoken to Bear Stearns about resolving this issue, no follow-up work was conducted. This issue raised by OCIE was clearly significant in nature as in fact, according to an internal memorandum, TM and OCIE both agreed that they must reach an agreement with Bear Stearns on this issue prior to its approval as a CSE. In addition, OCIE identified a second

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154, March 15, 2007) recommendation. In response to the report Chairman Cox told GAO: "To implement this recommendation, I have carefully considered the question of which organizational structure will best achieve the goal of the CSE program. I have concluded that the success of the CSE program will be best ensured if the supervision of the CSE firms is fully integrated with, rather than merely coordinated with, the detailed onsite testing that is done of the documented controls at CSE firms. As a result, I have decided to transfer responsibility for on-site testing of the CSE holding company controls to the Division of Market Regulation [now called TM]. This will better align the testing and supervision components of the CSE program, will strengthen its prudential character, and will most efficiently utilize the Commission's resources. With the new structure, ongoing supervision activities will be more directly informed by the results of focused testing of controls, and field inspections will be more precisely targeted using information from ongoing supervisory work. In addition, the Commission's expertise related to the prudential supervision of securities firms will be concentrated in the Division of Market Regulation, which will foster improved communication and coordination among the staff responsible for administering various components of the CSE program." The Chairman made his decision after carefully evaluating proposals from TM and OCIE, and after consulting with the four other Commissioners, who unanimously supported the decision to consolidate CSE oversight under TM.

<sup>172</sup> After the Orders allowing the firms to use the alternative capital method were issued (from December 2004 to November 2005), OCIE retained the inspection authority until March 2007 for all the firms except Morgan Stanley, which OCIE retained until September 2007, allowing OCIE to complete its inspection.

<sup>173</sup> These issues were identified in a memorandum from OCIE to TM dated November 4, 2005.

significant issue during the application inspection, regarding the adequacy of Bear Stearns' VaR models, as discussed on page 20. The OIG expert found similar problems with Bear Stearns' VaR models, which raised serious questions about TM's oversight of Bear Stearns.

As a result, it is possible that other issues identified by OCIE were significant and were not adequately followed up on by TM.

**Recommendation 15:**

The Division of Trading and Markets should: (1) reassess all the prior Office of Compliance Inspections and Examinations (OCIE) issues to ensure that no significant issues are unresolved (given the belief that OCIE followed up); and (2) follow up on all significant issues.

## **Finding 6: The Commission's Orders Allowing Firms (Including Bear Stearns) To Use The Alternative Capital Method Were Generally Approved Before The Inspection Process Was Completed**

The Commission approved firms to use the alternative capital method before OCIE completed its inspection process.

OCIE's and TM's inspections of firms are a significant part of the application process, and are supposed to be completed prior to a firm's approval as a CSE.<sup>174</sup> The purpose of an inspection is to verify the information provided by the firm and to "assess the adequacy of the implementation of the firm's internal risk management policies and procedures."<sup>175</sup> However, four of five Commission Orders approving the firms (those without principal regulators) to use the alternative capital method were issued by the Commission before the inspection process was completed, thereby rendering the application process less meaningful.<sup>176</sup> TM acknowledged that they were aware that OCIE did not complete the inspection process prior to the Commission's approval. Yet, TM recommended to the Commission that the firms be approved to use the alternative capital method without first completely verifying the information it was

<sup>174</sup> As a result of the organizational change at the Commission, OCIE would no longer be involved in the application inspection.

<sup>175</sup> Source: SEC [Commission]  Holding Company Supervision Program Description. Commission. 5 June 2008. <<http://www.sec.gov/divisions/marketreg/hcsupervision.htm>>.

<sup>176</sup> Other than the inspection performed during Bear Stearns' application process, neither TM nor OCIE performed any additional inspections of Bear Stearns involving firm-wide issues (e.g., risk management) prior to its collapse. However, this does not include any inspections (e.g., financial and operational) that FINRA performed of Bear Stearns' broker-dealers.

supposed to be relying upon and without ensuring that the firms had adequately implemented internal risk management policies and procedures.

Specifically, we found that:

- In two instances, the Commission approved the Order before OCIE sent the firms a formal letter (*i.e.*, the deficiency letter) describing the issues that were identified during the inspection. Bear Stearns was one of these two firms. In fact, as previously discussed in Finding 5, during Bear Stearns' inspection, OCIE identified a significant issue involving Bear Stearns not retaining internal audit workpapers. In fact, according to an internal memorandum, TM and OCIE both agreed that they must reach an agreement with Bear Stearns on this issue prior to the approval of its CSE application. While TM believes that Bear Stearns implemented corrective action, TM never verified Bear Stearns' assertions that it had resolved this issue, as TM did not follow up on many of the OCIE issues.
- In two instances, the Commission approved the Order before the firms responded to the deficiency letter.

TM indicated that they discussed the issues orally with the firms and were comfortable with their responses and, as a result, recommended that the Commission issue the Orders. OCIE stated that it was not involved in this decision process at all.

**Recommendation 16:**

The Division of Trading and Markets should ensure that they complete all phases of a firm's inspection process before recommending that the Securities and Exchange Commission allow any additional Consolidated Supervised Entity firms the authority to use the alternative capital method.

## **Finding 7: Collaboration Between TM And Other Commission Divisions/Offices Should Be Significantly Improved**

TM should improve its collaboration with the Division of Corporation Finance (CF), OCIE, and the Office of Risk Assessment (ORA) in order to achieve efficiencies and the overall effectiveness of Commission operations.

### **Collaboration with CF**

The CF staff who review company filings (*e.g.*, Form 10-K) are assigned to Industry Groups within CF. CF assigns firms to a particular group based on their

Standardized Industrial Classification code.<sup>177</sup> Periodically, CF management reassigns firms to adjust the staff's workload. During the past two years, CF twice transferred the CSE firms to different Industry Groups.

CF staff stated that they received a briefing from TM regarding how the CSE program operates. However, according to CF, TM did not provide any specifics regarding the information that the CSE program obtains from the CSE firms.

We believe that the information that TM obtains could substantially improve CF's filing review process. For instance, CF could evaluate whether the information in the filing (e.g., mark to market accounting, VaR models, funding sources) is consistent with TM's information. Furthermore, as a result of Bear Stearns' collapse, CSE firms are now required to disclose additional information regarding capital and liquidity. Also, Basel's Pillar 3 standard (when implemented) will require additional disclosures regarding capital, risk exposures, and risk assessment. TM stated that the CSE firms would incorporate all of these new disclosures mainly into their CF filings. These additional disclosures will, therefore, increase the need for collaboration between TM and CF.

Our audit found that CF could not opine on the potential usefulness of TM's information on the filing review process since they are not aware of the information that TM receives on the CSE firms. The effectiveness of CF's filing review is potentially diminished because CF is not incorporating TM's information on the CSEs into its review process.

**Recommendation 17:**

The Divisions of Corporation Finance (CF) and Trading and Markets (TM) should take concrete steps to improve their collaboration efforts and should determine whether TM's information on the Consolidated Supervised Entity (CSE) firms could be used by CF in its review of the CSE firms.

**Collaboration with OCIE**

GAO found that TM and OCIE should improve communication (e.g., information sharing) between their offices.<sup>178</sup> Although TM and OCIE informed GAO during its audit in 2007, that they were working on an agreement to improve communication, they never finalized the agreement.

In March 2007, Chairman Cox decided to transfer inspection responsibility from OCIE to TM (responsibility was transferred to TM in March 2007 for four of the

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<sup>177</sup> "The Standard Industrial Classification was created by the United States government as a means of classifying industries by the use of a 4-digit coding system to collect economic data on businesses."  
(Source:

[http://www.business.com/directory/management/strategic\\_planning/business\\_information/industry\\_research/classification\\_systems/standard\\_industrial\\_classification\\_sic/](http://www.business.com/directory/management/strategic_planning/business_information/industry_research/classification_systems/standard_industrial_classification_sic/).

<sup>178</sup> Source: GAO. Financial Market Regulation, Agencies Engaged in Consolidated Supervision Can Strengthen Performance Measurement and Collaboration, Report No. 07-154. March 15, 2007.

five firms, and for the last firm (Morgan Stanley) following the completion of the ongoing OCIE exam of that firm in September 2007). However, despite this organizational change, TM and OCIE could still improve their collaboration involving the broker-dealers of the CSE firms. OCIE stated that TM does not provide it access to information that TM obtains from meetings with CSE staff, filings submitted by the CSE firms, and other sources of information. OCIE stated that all of this information could improve their risk-based broker-dealer inspections. A senior staff official at a CSE firm stated there is no coordination between TM and OCIE and this creates a challenge. OCIE stated that it believes that it would still be useful to finalize the agreement to improve collaboration and TM has not identified any substantive reasons to oppose finalizing the agreement.

**Recommendation 18:**

The Division of Trading and Markets (TM) and the Office of Compliance Inspections and Examinations (OCIE) should develop a collaboration agreement (e.g., discussing information sharing) that maintains a clear delineation of responsibilities between TM and OCIE with respect to the Consolidated Supervised Entity program. They should inform the Chairman's Office of any disagreement(s) so that the issue(s) can be resolved.

**Collaboration with ORA**

The missions of ORA and the CSE programs' have certain similarities. ORA's mission includes identifying emerging issues and market risks<sup>179</sup> while the CSE's program mission states that its purpose is to:

... allow the Commission to monitor for, and act quickly in response to, financial or operational weakness in a CSE holding company or its unregulated affiliates that might place regulated entities, including US and foreign-registered banks and broker-dealers, or *the broader financial system at risk*.<sup>180</sup> [Emphasis added]

We believe that a formal understanding between ORA and TM would increase the likelihood that ORA achieves its mission while potentially minimizing duplicative efforts in identifying and analyzing risks.

**Recommendation 19:**

The Division of Trading and Markets and the Office of Risk Assessment should develop an agreement outlining their roles and responsibilities, as well as methods for information sharing such as communicating project results. These

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<sup>179</sup> Source: Jonathan Sokobin Named Director of SEC's Office of Risk Assessment. Commission. 28 February 2008. <<http://www.sec.gov/news/press/2008/2008-24.htm>>.

<sup>180</sup> Source: SEC [Commission] Consolidated Supervision of Broker-Dealer Holding Companies Program Overview and Assessment Criteria. Commission. 16 Mar 2007. <<http://www.sec.gov/divisions/marketreg/cseoverview.htm>>.

two offices should inform the Chairman's Office of any disagreement(s) so that the issue(s) can be resolved.

## **Finding 8: CF's Filing Review Of Bear Stearns' 2006 10-K Was Not Timely**

CF is responsible for reviewing filings of all public reporting companies, such as Bear Stearns. However, CF's review of Bear Stearns' 2006 10-K was not timely.

### **Review of Bear Stearns' 10-K Filing**

There are significant issues regarding CF's review of Bear Stearns' 2006 10-K filing dated November 30, 2006. The filing review emphasized Bear Stearns' disclosures involving its exposure to subprime mortgage securities.<sup>181</sup>

Bear Stearns submitted its 2006 10-K filing to the Commission on February 13, 2007. The CF staff accountant completed the initial review of Bear Stearns' 2006 10-K filing on April 30, 2007, approximately 2½ months after Bear Stearns submitted the filing. Another CF staff accountant completed a second level review on September 27, 2007, nearly five months after the initial review. CF could not provide a specific reason as to why the second reviewer did not perform the review in a timely manner.

CF sent a comment letter<sup>182</sup> to Bear Stearns on September 27, 2007, which, among other things, requested additional information on Bear Stearns' exposure to subprime mortgage securities. Thus, it took CF nearly 7½ months, after Bear Stearns' initial filing, to send a letter to Bear Stearns requesting additional information.

CF's policy is to send a comment letter to a firm prior to the firm's next fiscal year-end. In the case of Bear Stearns, its next fiscal year-end was November 30, 2007 and the Commission received its 2007 10-K on February 13, 2007. According to CF's policy, CF needed to provide Bear Stearns with a comment letter before November 30, 2007.<sup>183</sup> In this way, the firm would have an opportunity to incorporate appropriate changes into its next year's 10-K filing. However, other than this policy, CF does not have any internal guidelines regarding timeframes within which to review filings and issue comment letters.<sup>184</sup>

<sup>181</sup> CF staff performed a targeted review that focused on subprime mortgage exposure and revenue recognition.

<sup>182</sup> The staff provide firms with a written memorandum (*i.e.*, a "comment letter") describing the staff's filing review comments.

<sup>183</sup> In this instance, CF met its policy of issuing a comment letter prior to Bear Stearns' fiscal year end.

<sup>184</sup> The Sarbanes Oxley Act of 2002 also requires CF to review each public reporting company at least one

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SEC's Oversight of Bear Stearns and Related Entities: The CSE Program September 25, 2008  
Report No. 446-A

We believe that a five-month timeframe to complete a second review coupled with a total time of 7½ months to send a comment letter to Bear Stearns was simply unacceptable in this particular instance, because this filing review focused on the material issue of subprime mortgage securities (which was adversely affecting the securities industry worldwide).

Bear Stearns' response letter (coupled with CF's comment letter) contained material information that investors could have used to make well-informed investment decisions.<sup>185</sup> For example, Bear Stearns' response letter described its criteria for classifying loans as sub-prime, information about its risk management philosophy, how it defines non-performing loans and a quantification of its investments in securities backed by subprime mortgages. The OIG expert believes that all of these criteria would have been helpful to investors.<sup>186</sup>

We did not perform audit work to determine CF's timeliness in reviewing 10-K filings in general. Despite the lack of information about other filings, based upon CF's review of Bear Stearns' 10-K filing, we believe that the filing review process lacks the appropriate internal controls (*i.e.*, timeframes for conducting second level reviews) to ensure timely reviews.

**Recommendation 20:**

The Division of Corporation Finance should: (1) develop internal guidelines for reviewing filings in a timely manner, and (2) track and monitor compliance with these internal guidelines.

**Bear Stearns' Response to CF's Comment Letter**

Pursuant to CF policy, firms are supposed to reply within 10 business days to CF comment letters. Thus, Bear Stearns' reply was due on October 12, 2007. Prior to this due date, Bear Stearns asked CF (in writing) and received an extension until early November 2007 to file its response. However, Bear Stearns did not respond by this new due date. Bear Stearns then orally asked for and received additional extensions. Bear Stearns finally submitted its comments to CF on January 31, 2008, nearly 3½ months after the initial due date.<sup>187</sup>

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time every three years.

<sup>185</sup> This information was especially material given that Bear Stearns' stock price went from a one-year closing price high of \$158 (April 25, 2007) to a closing price high of \$77 the week before March 10, 2008. The final price was \$10, the sale price that JP Morgan paid.

<sup>186</sup> CF does not consider its public comment letters and firms' response letters as a means of disseminating (*i.e.*, disclosure) information about public companies. Rather, CF believes that changes to a firm's filings, as a result of CF's comment letters, should be the primary disclosure method. In fact, CF does not post its public comment letters and a firm's response letters to the public site of EDGAR until an issue has been fully resolved.

<sup>187</sup> Two other CSE firms did not respond in a timely manner to comments on their 2006 10-K filings. These filing reviews also emphasized subprime mortgages.

As a result of Bear Stearns' delays, the CF staff accountant did not complete the initial review of Bear Stearns' response until March 4, 2008 and the second reviewer did not complete her review until April 2, 2008, by which time Bear Stearns had already collapsed.

It is our understanding that Bear Stearns' delay in responding to the comment letter was not a unique situation and CF routinely grants extensions to firms to address CF's comment letters. Further, CF informed us that it only requests a firm to contact CF within 10 days of receiving a comment letter and does not require a substantive response to the issues within the 10-day timeframe. Thus, while CF imposes a timeframe for a firm to contact CF, CF does not have a policy prescribing when firms are expected to respond to the issues raised in CF's comment letters.

While there are several consequences that may be imposed on a firm for not responding timely (*e.g.*, the firm may be required to make additional disclosures in future filings regarding the outstanding staff comments or the staff may refer the matter to the Commission's Division of Enforcement for investigation), in the case of Bear Stearns, none of these consequences occurred. Furthermore, by granting repeated extensions, the filing review was rendered less meaningful since the staff completed the filing review after Bear Stearns collapsed. As a result, we believe that investors could have used this material information to make well-informed investment decisions. In addition, the information (*e.g.*, Bear Stearns' exposure to subprime mortgage securities) could have potentially been beneficial to dispel the rumors that led to Bear Stearns' collapse.

**Recommendation 21:**

The Division of Corporation Finance (CF) should (1) establish a policy outlining when firms are expected to substantively respond to issues raised in CF's comment letters, and (2) track and monitor compliance with this policy.

## **Finding 9: Certain Firms May Pose A Systemic Risk Because They Are Not Supervised On A Consolidated Basis**

Certain firms may pose a systemic risk because neither the Commission nor any other regulator currently supervises them on a consolidated basis.

Several large firms, other than the CSEs, have many customer accounts, hold large amounts of customer funds, and have unregulated affiliates. The broker-dealer affiliates of these firms are subject to the Risk Assessment program, but neither the Commission nor any other regulator supervises these firms on a



consolidated basis.<sup>188</sup> In most cases, these firms would be ineligible to apply for group-wide supervision under the CSE program. In some cases, these firms could voluntarily elect to be supervised under the Commission's CSE program or under the statutory supervision regime created by Gramm-Leach-Bliley Act,<sup>189</sup> but these firms are not required to elect this supervision.

Several firms both inside and outside the CSE program collapsed or otherwise experienced serious financial difficulties between March and September 2008.<sup>190</sup> As a result, we believe that if one of these other (non-CSE) firms failed or experienced another significant problem, the broader financial system could be adversely affected, thus impacting the Commission's mission of maintaining fair, orderly, and efficient markets. We did not perform an in-depth assessment of the risks that these firms present or the costs/benefits of supervising these firms on a consolidated basis because of resource constraints. However, we believe that in light of the impact of Bear Stearns collapse, it would behoove the Commission to perform such an analysis.

**Recommendation 22:**

Chairman Cox should create a Task Force led by the Office of Risk Assessment (ORA) with staff from the Divisions of Trading and Markets, and Investment Management, and the Office of Compliance Inspections and Examinations. The Task Force should perform an analysis of large firms with customer accounts that hold significant amounts of customer funds and have unregulated entities, to determine the costs and benefits of supervising these firms on a consolidated basis. If the Task Force ultimately believes that the Securities and Exchange Commission (Commission) should supervise these firms on a consolidated basis, it should make a recommendation to the Commission that involves seeking the necessary statutory authority to oversee these firms on a consolidated basis.

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<sup>188</sup> Some of the firms are also subject to the Investment Advisers Act of 1940 and the Investment Company Act of 1940. As a result, OCIE is responsible for inspecting these firms and the Division of Investment Management is responsible for the regulations.

<sup>189</sup> "The Gramm-Leach-Bliley Act of 1999 ("Act") will significantly impact the financial services industry. By repealing provisions of the Glass-Steagall Act, the Act facilitates affiliations between banks, securities firms, and insurance companies."

Source: Banking Information: Overview of the Gramm-Leach-Bliley Act. Federal Reserve Bank of San Francisco. < <http://www.frbsf.org/publications/banking/gramm/grammpg1.html> >.

<sup>190</sup> Between March and September 2008, Bear Stearns, Lehman Brothers, Merrill Lynch, mortgage originators Fannie Mae and Freddie Mac and the American International Group, Inc., all experienced major financial difficulties and collapsed, filed for bankruptcy, or were purchased or taken over by another entity.

## **Finding 10: TM Should Address Organizational Issues Involving The Future Of The CSE Program**

We identified several organizational issues involving the future of the CSE Program, which could significantly improve the CSE program.

### **Changes to the CSE Program**

Due to the collapse of Bear Stearns in March 2008, the bankruptcy filing by Lehman Brothers, the purchase of Merrill Lynch by Bank of America, the planned change in status to bank holding companies for Goldman Sachs and Morgan Stanley,<sup>191</sup> and the changing economic environment, the future of the CSE program is uncertain.

Since the collapse of Bear Stearns, several aspects of the CSE program's oversight activities have changed and other changes are being contemplated, as follows:

- The CSE program staff now closely scrutinize the secured funding activities of each CSE firm, with a view to lengthening the average term of secured and unsecured funding arrangements;
- The CSE program staff now obtain more funding and liquidity information for all CSEs;
- TM is in the process of establishing additional scenarios that entail a substantial loss of secured funding. The scenario analyses help TM to determine whether firms could survive in a stressed environment;
- TM is discussing with CSE senior management their long-term funding plans, including plans for raising new capital by accessing the equity and long-term debt markets.
- The Commission plans to request legislative authority to regulate the CSEs at the holding company level as well as the authority to require compliance. Currently, participation in the CSE program is voluntary. TM claims that the voluntary nature of the program does not capture all systemically important broker-dealer holding companies, as companies may not opt for such supervision. Additionally, the ability of a holding company to opt out of supervision creates tension when the Commission wishes to impose more rigorous requirements or mandate CSEs to address specific concerns, according to TM;

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<sup>191</sup> On September 21, 2008, the Federal Reserve approved, pending a statutory five-day antitrust waiting period, applications from Goldman Sachs and Morgan Stanley to become bank holding companies.

- Chairman Cox has discussed the CSEs programs' need to have systems in place to systematically unwind or liquidate a failing institution at the holding company level. Currently, regulators are only permitted to intervene in the liquidation of a holding company's subsidiaries, such as broker-dealers and banks.

According to TM, intervention at the holding company level would allow the Commission to operate a failing institution for a limited period of time and would protect the institution's customers and counterparties. Such holding companies typically have substantial activities outside its U.S. bank or broker-dealer. TM believes that the Commission's lack of authority to intervene at the holding company level could lead to massive liquidations of collateral by counterparties to unregulated or non-U.S. regulated affiliates, which in turn, could cause market dislocations and put severe stress on other systemically important financial institutions; and

- The Commission has contemplated ways to improve the efficient and orderly operation of the tri-party repo market. Financial institutions rely on the repo market to finance proprietary and customer positions. If a repo clearing entity is unable to conduct business in an orderly manner, or if a major firm does not have ready access to the repo market, it could have systemic effects on a large number of financial institutions. Bear Stearns was not able to access the repo market on normal business terms, which, according to some accounts, led to its demise.

Changes to the program will require Chairman Cox, Congress, and TM to re-evaluate the needs and priorities of the CSE program.

**Recommendation 23:**

The Division of Trading and Markets, in consultation with the Chairman's office, should determine what additional changes need to be made to the Consolidated Supervised Entity (CSE) program in light of the collapse of Bear Stearns and changing economic environment.

**Program Staffing**

The CSE program consists of a small number of staff, several of whom have worked in the CSE program since its inception in 2004. The Office of CSE Inspections currently has only two staff in Washington, DC and five staff in the New York regional office. It also does not currently have an Assistant Director (*i.e.*, an office head).

In March 2007, Chairman Cox decided to transfer inspection responsibility from OCIE to TM (responsibility was transferred to TM in March 2007 for four of the five firms, and for the last firm (Morgan Stanley) following the completion of the ongoing OCIE exam of that firm in September 2007). However, as of mid-September 2008, TM staff had not completed any inspections in the 18 months

since the Chairman's decision in March 2007. Three inspections are in varying stages of completion. These inspections act to "assess the adequacy of the implementation of the firm's internal risk management policies and procedures".<sup>192</sup> No milestones are in place to ensure that inspections are completed in a timely manner.

Furthermore, staff at the CSE firms informed the OIG that the inspections information would be useful to them, especially because it would provide the CSEs with information regarding best practices and where the firms stand in relation to each other. It is imperative to receive this information timely to ensure that the information does not become outdated.

**Recommendation 24:**

The Division of Trading and Markets (TM) should fill critical existing positions, and consider what any additional staff it believes will be needed to carry out the CSE program's function going forward. TM should also establish milestones for completing each phase of an inspection and implement a procedure to ensure that the milestones are met.

**Ethics Manual**

In 1997, OCIE developed an ethics manual for its Inspection staff because it wanted to formalize standards of behavior and ensure that inspections are conducted in a fair and impartial manner. This manual has been revised and expanded several times since 1997. We believe that a similar manual would be beneficial for TM's monitoring and inspection staff given their close working relationship with the CSE staff.

**Recommendation 25:**

The Division of Trading and Markets, in consultation with the Office of Compliance Inspections and Examinations and the Commission's Ethics office, should develop an ethics manual.

**Coordination with Other Regulators**

The CSE program staff are increasingly working with the Federal Reserve and other Federal regulators in its administration of the CSE program. Increased coordination with the Federal Reserve is particularly important because the Federal Reserve, unlike the Commission, is in a position to provide emergency funding to distressed firms. Improved communication and information sharing among Federal regulators should also reduce overlaps and alleviate the firms' need to produce duplicative information for each entity. The memorandum of understanding that the Commission and the Federal Reserve entered into in July 2008 is a positive step.

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<sup>192</sup> Source: SEC [Commission] [Holding Company Supervision Program Description](http://www.sec.gov/divisions/marketreg/hcsupervision.htm). Commission. 5 June 2008. <<http://www.sec.gov/divisions/marketreg/hcsupervision.htm>>.

Additionally, we believe that the CSE program staff will need to further recognize the interconnectedness between securities firms and banks. A general perception, as communicated by a staff member at a CSE firm, is that if a broker-dealer fails, the Commission seems to worry only about customer assets, and if a bank fails, the Federal Reserve seems to worry only about depositors' accounts. Neither regulator appears to focus on systemic risk, nor how the interconnectivity among securities firms and banks affects the overall landscape.

**Recommendation 26:**

The Division of Trading and Markets should continue to seek out ways to increase its communication, coordination, and information sharing with the Federal Reserve and other Federal Regulators

## Acronyms

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BDRA	Broker-Dealer Risk Assessment
Bear Stearns	The Bear Stearns Companies, Inc.
BSAM	Bear Stearns Asset Management
CF	Division of Corporation Finance
CFP	Contingency Funding Plan
Commission	Securities and Exchange Commission
CSE	Consolidated Supervised Entity
EU	European Union
FINRA	Financial Industry Regulatory Authority
Federal Reserve	Board of Governors of the Federal Reserve System
FRBNY	Federal Reserve Bank of New York
GAO	Government Accountability Office
JP Morgan	JP Morgan Chase & Co
Lehman Brothers	Lehman Brothers Holdings Inc.
LTCM	Long-Term Capital Management
Merrill Lynch	Merrill Lynch & Co
MOU	Memorandum of Understanding
OCIE	Office of Compliance Inspections and Examinations
OIG	Office of Inspector General
ORA	Office of Risk Assessment

## APPENDIX I CONTINUED..

OTS	Office of Thrift Supervision
PCAOB	Public Company Accounting Oversight Board
PWG	President's Working Group
Repo	Repurchase Agreements
SOX	Sarbanes-Oxley Act of 2002
SRO	Self Regulatory Organizations
TM	Division of Trading and Markets
U.S.	United States
VaR	Value at Risk

## Congressional Audit Request

**United States Senate**

COMMITTEE ON FINANCE

WASHINGTON, DC 20510-6206

April 2, 2008

**Via Electronic Transmission**

The Honorable David Kotz  
 Inspector General  
 US Securities and Exchange Commission  
 100 F Street, NE  
 Washington, DC 20549-2736

Dear Inspector General Kotz:

According to regulatory filings and a December 2007 *Wall Street Journal* article, the SEC Enforcement Division declined to bring a case against Bear Stearns for improperly valuing mortgage-related investments. Given the later collapse and federally backed bail-out of Bear Stearns, Congress needs to understand more about this case and why the SEC ultimately sought no enforcement action.

Moreover, I am particularly interested in this case in light of the SEC's failed investigation of Pequot Capital Management. As you know, in the final report of the Senate's inquiry into that matter, we found that senior SEC officials showed extraordinary deference to a particular witness because of his "prominence" as the head of Morgan Stanley.

**Request for Investigation**

In light of my earlier investigation I need to know whether the same problems identified in the Pequot investigation were repeated in the Bear Stearns case. Accordingly, I request that you conduct a thorough investigation into the facts and circumstances surrounding the decision to not pursue an enforcement action against Bear Stearns. Please provide a final report on whether there was any improper action or misconduct relating to SEC investigation of Bear Stearns and its decision to close the investigation. The report should also describe and assess:

1. the nature, extent, and propriety of communications between Bear Stearns executives or their representatives and senior SEC officials;
2. the decision-making process which led to the SEC's failure to bring an enforcement action following the drafting of a Wells notice;
3. the reasons for declining to proceed with an enforcement action; and



APPENDIX II CONTINUED..

4. the degree to which more aggressive action by the Enforcement Division may have led to an earlier and more complete understanding of the issues that contributed to the collapse of Bear Stearns.

**Request for Audit**

In addition to this investigative request, I would also like your office to follow-up on previous audit work relevant to issues surrounding Bear Stearns. The Division of Trading and Markets (Division) is responsible for regulating the largest broker-dealers and the associated holding companies. Offices within the Division are staffed with accountants and economists who are responsible for reviewing the market and credit-risk exposures of the broker-dealers. Their review includes assessing broker-dealers' quarterly financial filings, ensuring broker-dealers are meeting net-capital requirements and that other financial ratios, such as liquidity ratios, are adequate. There is a special emphasis in reviewing the five very large broker-dealers, including Bear Stearns, known as the Consolidated Supervised Entity (CSE) Program. The Division staff exercises additional oversight of these firms and examines their risk models.

I understand that the OIG conducted a prior audit of these responsibilities in 2002. Please provide an update of the previous findings, determine whether earlier recommendations were implemented, and analyze the current function of these offices. The review should include a description and assessment of their missions, how the programs are run, their policies and procedures, the adequacy of any reviews conducted regarding Bear Stearns, and recommendations for improvements in the process.

If you have any questions about these requests, please contact Jason Foster or Emilia DiSanto at (202) 225-4515.

Sincerely,



Charles E. Grassley  
Ranking Member

## Curriculum Vitae (Albert "Pete" Kyle)

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### CURRICULUM VITAE Albert S. "Pete" Kyle

Date: February 25, 2007

Current Position: Charles E. Smith Professor of Finance, Robert H. Smith School of Business

Business Address: University of Maryland, 4433 Van Munching Hall, College Park, MD 20742

Business Phone: 301-405-9684 (UMD voice), 301-314-5828 (UMD fax)

E-Mail: akyle@rhsmith.umd.edu

#### EDUCATION

- University of Chicago, 1977-1979, 1980-1981. Ph.D., Economics, 1981.  
Dissertation: "An Equilibrium Model of Speculation and Hedging."  
Advisors: José Scheinkman (chair), Robert E. Lucas, Lester Telser.
- Nuffield College, Oxford University, 1976-1977. Field: Economics. Advisor: James Mirrlees.  
Met all requirements for B.Phil. degree (now called M.Phil.) except two-year residency requirement.
- Merton College, Oxford University, 1974-1976. B.A. Math and Philosophy, 2<sup>nd</sup> class honors, 1976.
- Davidson College, 1970-1974. B.S. Mathematics, summa cum laude.

#### CAREER

- Charles E. Smith Professor of Finance (with tenure), Robert H. Smith School of Business, University of Maryland, August 2006 to Present
- Professor of Finance and Economics (with tenure), Duke University, Fuqua School of Business and Department of Economics, January 2002 - 2006 (appointment predominantly in Fuqua School of Business)
- American Standard Visiting Professor, Said Business School, Oxford University (St. Edmund Hall), June 2004, June 2005, June 2006.
- Visiting Scholar, Princeton University, Department of Economics, Fall 2004 (while on sabbatical leave from Duke University).
- Consultant, Morgan-Stanley and Company, December 1996 - December 1998, full time while on unpaid leave from Duke University, Proprietary trading research.
- Associate Professor of Finance (with tenure), Duke University, Fuqua School of Business, July 1992-July 2002 (on unpaid leave for calendar years 1997, 1998).
- Associate Professor of Finance (with tenure), University of California at Berkeley, Haas School of Business, July 1990-June 1992.
- Visiting Scholar, Duke University, Fuqua School of Business, September 1991-June 1992 (on sabbatical leave from UC Berkeley Fall 1991).
- Assistant Prof. of Finance, Univ. of California at Berkeley, Haas School of Business, July 1987-June 1990.
- Assistant Prof. of Economics and Public Affairs, Woodrow Wilson School, Princeton University, 1981-87.
- Visiting Fellow, Yale School of Organization and Management, Spring 1984 (on sabbatical leave from Princeton University).
- Visiting Research Fellow, Centre of Policy Studies, Monash University, Australia, Fall 1983 (on sabbatical leave from Princeton University).
- Pit Trading and Risk Management, Goodman-Manaster and Company, Chicago, 1979-1980.
- Staff Economist, Chicago Board of Trade, part-time, 1978-1979.

## APPENDIX III CONTINUED..

### PUBLICATIONS IN REFERRED JOURNALS

(In co-authored articles, all authors have equal seniority and approximately equal contribution.)

- Avinash K. Dixit and Albert S. Kyle, "The Use of Protection and Subsidies for Entry Promotion and Deterrence," American Economic Review, Vol. 75, No. 1, 1985, pp. 139-152.
- Albert S. Kyle, "Continuous Auctions and Insider Trading," Econometrica 53, 1985, 1335-1355.
- Albert S. Kyle, "Improving the Performance of the Stock Market," California Management Review, 30:4, Summer 1988, 90-114.
- Peter R. Hartley and Albert S. Kyle, "Equilibrium Investment in an Industry with Moderate Investment Economics of Scale," The Economic Journal, 99:396, June 1989, 392-407.
- Peter R. Hartley and Albert S. Kyle, "Real Rates and Home Goods: A Two Period Model," The Economic Record, 64:186, September 1988, 168-177.
- Albert S. Kyle, "Informed Speculation with Imperfect Competition," Review of Economic Studies 56:3, No. 187, July 1989, 317-356.
- Albert S. Kyle and Jean Luc Vila, "Noise Trading and Takeovers," Rand Journal of Economics, Vol. 22, No. 1, Spring 1991, pp. 54-71.
- John Y. Campbell and Albert S. Kyle, "Smart Money, Noise Trading, and Stock Price Behavior," Review of Economic Studies 1993, 60 pp. 1-34.
- Albert S. Kyle and Albert Wang, "Speculation Duopoly with Agreement to Disagree: Can Overconfidence Survive the Market Test?" Journal of Finance, volume LII, number 5, December 1997, pp. 2073-2090.
- Albert S. Kyle and Wei Xiong, "Contagion as a Wealth Effect," Journal of Finance, volume LVI, No. 4, August 2001, pp. 1401-1440.
- Albert S. Kyle, Hui Ou-yang, and Wei Xiong, "Prospect Theory and Liquidation Decisions," Journal of Economic Theory, Elsevier, vol. 127 (1), July 2006, pp. 273-288.

### CHAPTERS IN BOOKS

- Albert S. Kyle, "Imperfect Competition, Market Dynamics, and Regulatory Issues," in Financial Markets and Incomplete Information: Frontiers of Modern Financial Theory, Vol. 2, edited by Sudipto Bhattacharya and George M. Constantinides, Rowman and Littlefield, 1989, 153-161.
- Albert S. Kyle, "A Theory of Futures Market Manipulations," The Industrial Organization of Futures Markets, edited by Ronald W. Anderson, Lexington, Mass., Lexington Books, 1984, pp. 141-173, also reprinted in Paul Weller (editor), The Theory of Futures Markets, Blackwell, 1992 pp. 272-303.

### PUBLICATIONS IN UNREFEREED CONFERENCE VOLUMES

- Albert S. Kyle, "Trading Halts and Price Limits," The Review of Futures Markets, 7:3, 1988, 426-434.
- Albert S. Kyle, "Market Structure, Information, Futures Markets, and Price Formation," in International Agricultural Trade: Advanced Readings in Price Formation, Market Structure, and Price Instability, edited by Gary G. Storey, Andrew Schmitz, and Alexander H. Sarris, Boulder, Westview, 1984, pp. 45-64.
- Albert S. Kyle, "Discussion of 'The Pricing of Oil and Gas: Some Further Results,'" (by Merton Miller and Charles Upton), The Journal of Finance, Papers and Proceedings, Vol. 40, No. 3, July 1985, 1018-1020.
- Peter R. Hartley and Albert S. Kyle, "The Economics of Medical Insurance," in Medical Care and Medical Ethics, edited by C.L. Buchanan and E.W. Prior, Winchester, Mass., Allen & Unwin Inc., 1985, pp. 77-104.

## APPENDIX III CONTINUED..

### MISCELLANEOUS PUBLISHED ARTICLES

- Albert S. Kyle and Terry A. Marsh, "Computers and the Crash: Is Technology the Problem or the Solution?" Institutional Investor Financial Technology Forum 2, June 1988, pp. 6-7.

### UNPUBLISHED PAPERS

- Albert S. Kyle, "A Rational Expectations Model of Equilibrium in Speculative Markets with Imperfect Liquidity and Costly Information," Thesis seminar and job-market paper, 1980.
- Albert S. Kyle, "The Efficient Markets Hypothesis and the Supply of Speculative Services," manuscript, 1982.
- Albert S. Kyle, "An Equilibrium Model of Speculation and Hedging," University of Chicago Ph.D. Dissertation (Economics), 1981.
- Peter R. Hartley and Albert S. Kyle, "Equilibrium in a Model with Lumpy Investment," manuscript (now subsumed in "Equilibrium Investment in an Industry with Moderate Investment Economies," 1983).
- Avinash K. Dixit and Albert S. Kyle, "On the Use of Trade Restrictions for Entry Promotion and Deterrence," Economics Discussion Paper No. 56, Woodrow Wilson School, Princeton University, 1983.
- Albert S. Kyle, "Equilibrium in a Speculative Market with Strategic Informed Trading," (revised as "Informed Speculation with Imperfect Competition"). 1983.
- Albert S. Kyle, "Informational Efficiency and Liquidity in a Continuous Auction Futures Market," Centre for the Study of Futures Markets, Columbia Business School, Working Paper Series #CSFM-75, 1984.
- Albert S. Kyle, "An Explicit Model of Smart Money and Noise Trading," manuscript (now subsumed in "Smart Money, Noise Trading, and Stock Price Behavior), 1985.
- Albert S. Kyle, "An Intuitive Introduction to Agency Theory with Applications to Money Management," Q-Group Talk, manuscript, April 1989.
- Albert S. Kyle and Ailsa Roell, Comments on Recent Developments and Proposals Concerning Dealing Practices in the UK Equity Market," manuscript, 1989.
- Albert S. Kyle and Terry A. Marsh, "On the Economics of Securities of Clearing and Settlement," manuscript, 1993.
- Albert S. Kyle, "On Incentives to Acquire Private Information with Continuous Trading," manuscript, 1985.
- Albert S. Kyle, "Dealer Competition Against an Organized Exchange," manuscript, June 1987.
- Albert S. Kyle, "Market Failures and the Regulation of Financial Markets," manuscript, 1992.
- Gerard Gemotte and Albert S. Kyle, "Intertemporal Insider Trading with a Smooth Order Flow," manuscript, 1993.
- Albert S. Kyle and Tao Lin, "Continuous Speculation with Overconfident Competitors," manuscript, 2002.
- Albert S. Kyle and Tao Lin, "An Analysis of Excessive Trading Volume with Different Beliefs," manuscript, 2002.
- Albert S. Kyle and Rujing Meng, "Strategic Acquisitions and Investment in a Duopoly Patent Race under Uncertainty," manuscript, 2003.
- Ming Guo and Albert S. Kyle, "An Intemporal Asset Pricing Model with Strategic Informed Trading and Risk-Averse Market Makers," manuscript, 2004.
- Albert S. Kyle, "A Two-Factor Model of Value and Growth with Adjustment Costs," manuscript, 2004.
- Alex Boulatov and Albert S. Kyle, "Uniqueness of Equilibrium in the Single-Period Kyle-85 Model," manuscript, 2005.

## APPENDIX III CONTINUED..

### RESEARCH CONTRACTS AND GRANTS

- Research Consultant, Bell Laboratories, 1982.
- Research Associate, Center for the Study of Futures Markets, Columbia Business School, two months of summer support, 1983.
- Principal Investigator, NSF Grant (Information Science): "Organized Exchanges, Dealer Markets, and Anonymous Trading," Princeton University, Two summers of summer support, 1985, 1986.
- Academic Visitor, Federal Reserve Bank, Washington, D.C., June 6-10, 1992.
- Academic Visitor, Federal Reserve Bank, Atlanta, GA, 5 days, 2003.

### FELLOWSHIPS, PRIZES, AND ACADEMIC AWARDS

- Phi Beta Kappa, Davidson College, 1974.
- Honorary Postmastership, Merton College, 1976-1977.
- George Webb Medley Prize in Economics, Merton College, Oxford University, 1976.
- Rhodes Scholarship (Texas), Davidson College, 1974-1977.
- Schwabacher Fellowship, Haas School of Business, 1988-1989.
- Batterymarch Fellowship, 1990-1991.
- NSF Graduate Fellowship, University of Chicago, 1977-1979, 1980-1981.
- Keynote Speaker, Western Finance Association, Park City, Utah, June 25, 2002, "Market Microstructure."
- Keynote Speaker, Twelfth Annual Conference on The Theories and Practices of Securities Markets, National Sun Yat-sen University, Kaohsiung, Taiwan, "Insider Trading and Corporate Governance," December 17, 2004.
- Assurant Lecture, Assurant/Georgia Tech International Finance Conference, "Market Microstructure and Rational Expectations: A Primer," April 8, 2005.
- Fellow, Econometric Society, 2002-present.
- Clarendon Lectures in Finance, Oxford University, June 2006.

### PH.D. DISSERTATION ADVISING

(Initial academic placements are tenure track assistant professors or equivalent, unless otherwise indicated.)

#### Princeton University:

Steve Kealhofer (Chair, 1983), Columbia University Business School; KMV.  
George Mailath (Second Reader, 1984), University of Pennsylvania, Department of Economics.  
Loretta Mester (1985), Federal Reserve Board, Philadelphia.  
Menachem Sternberg (Second Reader, 1983), Commodities Corporation.  
Mark Ducey (Second Reader, 1984), Rice University.  
Lenny Nakamura (Second Reader, 1985), Federal Reserve Board, Philadelphia.  
Ian Gale (Chair, 1985), University of Wisconsin, Federal Reserve Board, Cleveland.  
Julie Nelson (Second Reader, 1986), New York University Business School.  
Matt Spiegel (Second Reader, 1987), Columbia University, UC Berkeley, Yale University.  
Jean Luc Vila (Second Reader, 1987), New York University, MIT.  
Blaise Allaz (Second Reader, 1987), University of Lausanne.

#### University of California, Berkeley:

Theodore Sternberg (Chair, 1989), Vanderbilt University.  
Helena Mullins (Chair, 1990), University of Oregon.  
Rich Lindsey (Chair, 1991), Yale University; Bear Stearns Securities.  
Peter Algert (Chair, 1991), University of California, Davis; Barclays Global Investor Services.

## APPENDIX III CONTINUED..

Jim Angel (Chair, 1991), Georgetown University.  
Lewis Lu (Chair, 1992), University of Hong Kong.  
Takeshi Yamada, (Chair, 1993), Hong Kong Univ. of Science and Technology; National Univ. of Singapore.

### Duke University:

John Graham (Chair, Finance, 1994), University of Utah; Duke University.  
Susan Monaco (Chair, Finance, 1995), University of Indiana.  
Lu Feng (Chair, Finance, 1995), Salomon Brothers; Stark Investments.  
Jianlin Zhai (Chair, Economics, 1996), Federal Home Loan Bank, Iowa.  
Jennifer Babcock (Accounting, 1997), Sloan School of Business, MIT.  
Mary Beth Fisher (Mathematics, 1998), BBT Bank.  
Brian Balyeat, (Chair, Finance, 1998), Texas A&M.  
Wei Xiong (Chair, Finance, 2001), Bendheim Finance Center, Princeton University.  
Jon Wongsuan (Tang) (Economics, 2002), Federal Reserve Board, Chicago.  
Ben Zhang (Economics, 2002), Moodies KMV; Fitch.  
Lin Peng (Chair, Finance, 2002), City University of NY, Baruch College.  
Emma Rasiel (Chair, Finance, 2003), Duke University (Lecturer)  
Ge Zhang (Finance, 2003), University of New Orleans.  
Julia Litvinova (Economics, 2003), The Brattle Group.  
Ilya Tsetlin (Decision Sciences, 2003), INSEAD Singapore.  
Tao Lin (Chair, Finance, 2003), University of Hong Kong.  
Krishna Narisimhan (Finance, 2004), Wharton Business School (visitor).  
Rujing Meng (Chair, Finance, 2004), University of Hong Kong.  
Mohan Gopalan (Finance, 2004), Barclays Global Investors, London.  
Lakshman Easwaran (Finance, 2004), Lehmann Brothers.  
Haofei Chen (Economics, expected 2005), Goldman Sachs, Hong Kong.  
Sandra Lizarazo (Economics, 2005), ITAM, Mexico City.  
Oksana Loginova (Economics, 2005), University of Missouri, Columbia.  
Will Xu (Chair, Economics, 2005), Hong Kong University.  
Ming Guo (Chair, Economics, 2005), Citadel Investment Group.  
Florin Dorobantu (Economics, expected 2006).  
Bin Wei (Co-chair, Finance, expected 2007).  
Fei Ding (Chair, Finance, expected 2007).  
Bruce Carlin (Co-chair, Finance, expected 2007).

### North Carolina State University:

Lu Na (Decision Sciences, 2004), Medical College of Wisconsin, BioStatistics Consulting-Center staff.

### University of North Carolina, Chapel Hill:

Albert Wang (Chair, Finance, 1994), Columbia University; Rice University.

### TEACHING (Estimated Enrollments)

#### University of Maryland:

BUFN 758V: Special Topics in Finance: Venture Capital and Private Equity  
Fall 2006: 35 students.

BMGT 808J: Doctoral Seminar: Market Microstructure and Industry Equilibrium  
Fall 2006: 10 students (including auditors)

## APPENDIX III CONTINUED..

Duke University: (One daytime MBA course meets for 2 hours 15 minutes twice a week for six weeks, plus exam. Ph.D. courses are one a semester system.)

**Finance I - First-year Finance Theory course for Ph.D. students**

Fall 2002: 30 students.  
Fall 2001: 20 students.  
Fall 2000: 20 students.  
Fall 1999: 20 students.  
Fall 1996: 15 students.  
Fall 1995: 15 students.  
Fall 1994: 15 students.  
Fall 1993: 10 students.  
Fall 1992: 10 students.

**Finance III - Second-year Finance Elective for Ph.D. students (Market Microstructure and Derivatives)**  
Spring 1998: 15 students.

**Venture Capital and Private Equity:**

Summer 2004: Week-end MBA, one section, 50 students.  
Fall 2003: Global Executive MBA One-Day Mini-course, 55 students.  
Fall 2003: Day-time MBA, two sections, with Rebecca Zarutskie, 100 students.  
Fall 2003: Cross-Continent Executive MBA, 50 students, taught as Advanced Corporate Finance.  
Summer 2004: Week-end MBA, one section, 50 students.  
Fall 2002: Global Executive MBA One-Day Mini-course, 50 students.  
Fall 2002: Day-time MBA, two sections, with Stephen Wallenstein, 110 students.  
Fall 2003: Cross-Continent Executive MBA, 50 students, taught as "Advanced Corporate Finance."  
Fall 2001: Global Executive MBA One-Day Mini-course, 50 students.  
Fall 2001: Day-time MBA, two sections, with Stephen Wallenstein, 110 students.  
Fall 2001: Cross-Continent Executive MBA, 25 students, taught as "Advanced Corporate Finance."  
Fall 2000: Day-time MBA, two sections, with Stephen Wallenstein, 110 students.

**Advanced Corporate Finance:**

Fall 2000: Day-time MBA, two sections, 70 students.  
Fall 1995: Daytime MBA, two sections, 90 students.  
Fall 1994: Daytime MBA, two sections, 90 students.  
Fall 1993: Daytime MBA, two sections, 90 students.

**Corporate Finance:**

Summer 2005: Week-end MBA, one section, 55 students.  
Fall 2005: Daytime MBA, four sections, 210 students.  
Fall 1996: Daytime MBA, two sections, 100 students.  
Fall 1995: Daytime MBA, two sections, 100 students.  
Fall 1994: Daytime MBA, two sections, 100 students.  
Fall 1993: Daytime MBA, one section, 60 students.  
Fall 1992: Daytime MBA, one section, 60 students.

University of California, Berkeley (MBA and Ph.D. courses on semester system)

**Finance I - First-year Finance Theory course for Ph.D. students**

Fall 1989: 15 students.  
Fall 1988: 15 students.  
Fall 1987: 15 students.

## APPENDIX III CONTINUED..

### Financial Theory: Gateway Investments elective for MBA students:

Spring 1988: Daytime MBA, two sections, 80 students.

Spring 1989: Daytime MBA, three sections, 130 students.

### Corporate Finance: Elective for MBA students:

Fall 1990: Daytime MBA, two sections, 80 students.

Fall 1990: Evening MBA, one section, 40 students.

Fall 1989: Evening MBA, one section, 40 students.

### Futures and Options: Advance Undergraduate Elective

Spring 1989: With David Modest, 20 students.

### Princeton University (Courses on semester system):

#### Finance I - First-year Finance Theory course for Ph.D. students

Fall 1981: With Raymond Hill, 20 students.

Fall 1982: 15 students.

Fall 1984: 15 students.

Fall 1985: With Sanford Grossman, 15 students.

Fall 1986: 15 students.

#### Financial Markets - Finance Elective for Woodrow Wilson Masters of Public Affairs students.

Fall 1981: 25 students.

Fall 1982: 25 students.

Fall 1984: 25 students.

Fall 1985: 25 students.

Fall 1986: 25 students.

#### Topics in Micro-economics - Elective for Woodrow Wilson Masters of Public Affairs students.

Fall 1981: 25 students.

Fall 1982: 25 students.

Fall 1985: 25 students.

### UNIVERSITY SERVICE

#### University of Maryland:

Business School Ph.D. Oversight Committee, 2006-2007.

Finance Area Ph.D. Committee, 2006-2007.

Finance Area Recruitment Committee, 2006-2007.

Finance Area Strategy Council, 2006-2007.

Business School Financial Lab Committee, 2006-2007.

Mentor to Assistant Professor Georgios Skoulakis

#### Duke University:

Member, Dean's Advisory Committee, 2002-2003.

Member, Duke Global Capital Markets Advisory Committee, 2000-2004.

Finance Area Coordinator, Fall 1995.

Finance Ph.D. Program Administrator, 2000-2003. Helped with Ph.D. admissions other years.

Health Sector Management Curriculum Review Committee, 2003.

TeraData Center Research Review Committee, 2002-2004.



## APPENDIX III CONTINUED..

Faculty Technology Committee, 2000.  
Organized Duke NYSE Conference on Market Microstructure, 1995.  
External Ad Hoc Committee Chairman: 1996.  
Internal Ad Hoc Committee Chairman: 1992, 1993, 1995.  
Internal Ad Hoc Committee Member: 2003, 2004.  
Curriculum Committee, 1995-1996.  
Elected Academic Council Representative, 1994-1995.  
Rhodes Scholarship Advisory Committee, 2001-2004.  
Junior and Senior Faculty Recruiting, 1992-2005, including interviewing at ASSA meetings most years.  
Carnegie Case Competition Advisor, 1999-2002.

### University of California, Berkeley:

Ph.D. Program Administrator, 1988-1991.  
Faculty Recruiting, 1987-1991, including interviewing at ASSA meetings.  
Elected Academic Council Representative, 1988-1989.  
Active Participant in Berkeley Program in Finance, 1987-1991.  
Active Participant in Financial Investment Technology (Executive Education) Program, 1989-1991.

### Princeton University:

Rhodes Scholarship Advisory Committee, 1984-87.  
Finance Faculty Recruiting, 1982-87, including interviewing at ASSA meetings several years.  
Woodrow Wilson Qualifying Exam Committee, 1984-87.  
Woodrow Wilson Ph.D. Committee, 1985-87.  
Economics Department Ph.D. Admissions, 1984-85.

### PROFESSIONAL SERVICE:

- NBER Research Associate, 1982-1985.
- Institute for the Study of Securities Markets, Member, Board of Directors, 1988-1992.
- Ecole Nationale des Ponts et Chaussees, Visiting Lecturer, two-week finance course, 1991, 1992, 1993.
- CEPR Summer Institute, Gerzensee, Switzerland, Participant, July 11-23, 1993.
- Frankfurt University, Guest Lecturer, Ph.D. lectures on market microstructure, Aug 13-15, 1999.
- Rhodes Scholarship Selection Committee, Illinois (1979, 1980), Florida (1998, 1999, 2000, 2001, 2002).
- American Finance Association, Board of Directors, Member, 2004-present.
- NASDAQ, Economic Advisory Board, Member, 2005-present.

### REFEREEING AND REVIEWING

- I typically referee 6-10 papers per year.
- I occasionally serve on program committees for conferences.
- Referee Reports and External Reviews, 2004: Journal of Financial Economics (3), Journal of Finance (2), Review of Financial Studies, American Economic Review, Econometrica, Journal of Political Economy, Journal of Economic Theory, Economic Journal, NSF, several reviews for tenure or promotion.
- Utah Winter Finance Conference Program Committee, 2004, 2005, 2006.

## APPENDIX III CONTINUED..

### SELECTED CONSULTING

- Goodman-Manaster and Company, 1981. Futures trading, risk management.
- Pepper, Hamilton, and Scheetz, 1984-1986, expert witness. Railroad deregulation. Reports with Robert Willig.
- Consultants in Industry Economics, Inc. 1983-1986, 1988, expert witness. Anti-trust.
- New York Stock Exchange, 1987, 1990, consultant. Market surveillance, insider trading.
- Commodity Futures Trading Commission, 1986-1989, expert witness. Hunt silver market manipulation. Report.
- Staff Member, Presidential Task Force on Market Mechanisms (Brady Commission), 1987-1988. Stock market crash of 1987, stock index futures, index arbitrage, portfolio insurance.
- Options Clearing Corporation, 1989. Clearing and settlement.
- Berkeley Financial Technologies, 1989-1991. Lectures on futures and options.
- Expert witness for Robert Griffin, 1991. Angelo et al vs. CFTC (Treasury Bond Futures tick size). Report and testimony.
- Law and Economics Consulting Group, 1991, manipulation.
- BARRA, 1991, measuring market liquidity.
- The Long Term Credit Bank of Japan, 1991-1996 interest rates and derivatives pricing.
- National Economic Research Associates, 1996, expert witness, securities fraud, damages.
- Salomon Brothers (Wachtell, Lipton, Rosen and Katz), 1991-1992, expert witness. Cocoa futures trading, damages. Deposition.
- Internal Revenue Service, 1996. Expert witness. Treasury Bond Futures trading.
- Justice Department, 1996. Expert witness. NASD market maker competition and tick size.
- Chase Securities, 2000, Foreign Exchange Order Flow
- Expert Witness, Alleged Price Manipulation of NYMEX Electricity Futures Involving Cash-Settled OTC Derivatives, 2003-2004. Report.
- Expert Witness, Barrick Gold Corporation, 2004-2005, price manipulation, damages.

### CURRENT RESEARCH INTERESTS

- Industry Dynamics and Valuation of Firms: An Integration of Corporate Finance and Industrial Organization
- Cash Settlement, Market Manipulation, and the Modigliani-Miller Theorem
- Trading Volume and Overconfidence
- Applications of Numerical Techniques in Finance.
- Settlement Negotiations with Endogenous Discovery
- Financial Contagion.
- Moral Hazard in Continuous Time.
- Trading with Transaction Costs.
- Algorithms for Pricing Interest rates and Derivative Assets.
- Continuous Trading with Many Informed Traders and Risk Aversion.
- Optimal Insider Trading with Smooth Noise Order Flow.
- Applications of complex analysis to finance.

## APPENDIX III CONTINUED..

### CONFERENCE PRESENTATIONS

- USDA Universities International Trade Consortium Meeting, December 1981. "Market Structure, Information, Futures Markets, and Price Formation."
- Center for the Study of Futures Markets, 1982. "A Theory of Futures Market Manipulations."
- NBER-KGSM Conference on Time and Information in Economics, February 1982. "The Efficient Markets Hypothesis and the Supply of Speculative Services."
- Centre of Policy Studies Conference on Distributional Issues in Health Care, 1983. "The Economics of Medical Insurance" (with Peter Hartley).
- Australian Meetings of the Econometrics Society, August 1983. "Equilibrium in a Speculative Market with Strategic Informed Trading."
- Allied Social Science Associations National Convention, December 1984. Session Chairman. Discussant in two sessions.
- Berkeley Program in Finance Seminar, Trading Costs and Trading Strategies, April, 1984. "Trading in Markets Where Buyers May Have Better Information."
- NBER - NYC Conference on Applications of Game Theory to Finance, December 1985. "Informed Speculation with Imperfect Competition."
- ASSA Convention, December 1985. "On Incentives to Acquire Private Information with Continuous Trading."
- Conference on Market Making, June 1987, London School of Economics, "Dealer Markets and Organized Exchanges."
- ASSA Convention, Discussant (three different sessions).
- ASSA Convention, December 1987. "Dealer Markets and Organized Exchanges."
- Discover Cal, Berkeley, February 12, 1988. Discussion of stock market crash.
- Financial Investment Technology Program, Berkeley, February 1988. Lectures on futures markets.
- Institutional Investor Pension Roundtable, Los Angeles, February 25, 1988. Panel discussion on the stock market crash.
- NBER Conference, Cambridge, MA March 10-11, 1988. Panel discussion on the stock market crash.
- Berkeley Program in Finance Seminar: Stock and Futures Markets: Lessons and Prospects, March 28-30, 1989, Santa Barbara, CA. "What Happened During the Week of the Crash" (with Terry Marsh).
- Wells Fargo Investment Advisors Seminar, San Francisco, April 11, 1988. Discussion of the stock market crash.
- CRSP Seminar, Drake Hotel, Chicago. May 1988. Panel discussion. Causes and Consequences of the Stock Market Crash.
- Institute for Fiduciary Education, Carmel Valley Ranch, CA. May 1988. Panel discussion on the 1987 stock market crash.
- Western Economic Assoc., Meetings, July 1, 1988.
- Berkeley Program in Finance Seminar. On Trading and Fund Management: The Role of Technology. September 23-27, 1988, Silverado, CA. Co-organizer (with Terry Marsh).
- Cal Business Alumni, Meridian Hotel, San Francisco, October 20, 1988, discussion on "The Stock Market Crash: A Year and a Day Later."
- Advanced Financial Technology Seminar of Futures Markets, December 6-10, 1989, Tokyo, lectures with David Modest.
- Chicago Board of Trade Conference on Futures Market Regulation, November 19, 1988, Mayflower Hotel, Washington, D.C., "Trading Halts and Price Limits."
- ASSA Convention, December 1988. Discussant.
- ASSA Convention, December 1988, "Estimating Intraday Price Volatility during the Crash, presented part of "Improving the Performance of the Stock Market."
- Institute for Quantitative Research in Finance (Q-Group), Spring Seminar, Orlando, Florida, April 18, 1989,

## APPENDIX III CONTINUED..

- "An Intuitive Introduction to Agency Theory with Applications to Money Management."
- New York Stock Exchange Academic Seminar, May 5, 1989. Roundtable discussion.
- STEP-CEPR Seminar, Bocconi University, Milan Italy, May 26, 1989, "Smart Money, Noise Trading, and Stock Price Behavior."
- University of Bonn Summer Workshop, Bonn W. Germany, June 28-July 8, 1989, invited guest.
- French Finance Association Conference (AFFI), June 28, 1989, "Smart Money, Noise Trading and Stock Price Behavior."
- New York Stock Exchange/London School of Economics Conference on Market Microstructure, London, England, November 15, 1989. Discussant.
- Washington University, Regional Finance Conference, November 1990, lecture on trading with asymmetric information.
- University of Iowa, Market Microstructure Conference, November 1990. "Dealer Markets and Organized Exchanges."
- Chicago Board of Trade Conference, Vanderbilt University, December 3, 1990. Discussant.
- ASSA Convention, Washington, D.C., December 30, 1990. Session chair.
- Berkeley Program in Finance, April 5-7, 1992. Discussant.
- Atlanta, Federal Reserve Bank, February 20, 1992. Discussant.
- New York Stock Exchange Conference, Los Angeles, California, March, 1992. Discussant.
- Commodity Futures Trading Commission, March 30-31, 1992.
- Konstanz, Germany, April 3-4, 1992. "Intertemporal Insider Trading..."
- Jerusalem, March 11, 1992. "Intertemporal Insider Trading..."
- Western Finance Association, June 22-24, 1992. Discussant.
- Stockholm, Sweden, August 21-22, 1992. "Market Failures and the Regulation of Financial Markets."
- Allied Social Sciences Association, January 5-7, 1993. Discussant.
- Berkeley Program in Finance, Lake Tahoe, California, March 14-16, 1993. Conference Summarizer.
- Allied Social Sciences Association, Boston, January 3-5, 1994. Discussant.
- Western Finance Association, Santa Fe, June 23-26, 1994. Discussant.
- National Bureau of Economic Research Conference, Key Largo, Florida, July 11-12, 1994. Discussant.
- Federal Reserve Bank of Atlanta Conference, Miami, March 3-4, 1995. Discussant.
- Q-Group Conference, November 22-29, 1995. "Active Mismanagement."
- Allied Social Sciences Association, San Francisco, 1996. Session Chair.
- Berkeley Program in Finance, Santa Barbara, September 29-October 1, 1996. Essay in Honor of Fischer Black.
- Western Finance Association Meetings, Los Angeles, June 19, 1999, discussant.
- Duke University Global Capital Markets Center, Conference on Bond Market Microstructure, Washington DC, October 19, 1999, presenter.
- SIR CA Mini-Conference on Insider Trading, Sydney, Australia, November 5, 1999, keynote speaker, "Insider Trading."
- Duke University Global Capital Markets Center, Conference on Hedge Funds, Durham, NC, November 19, 1999, moderator.
- NBER Asset Pricing Conference, Boston, May 5, 2000, discussant.
- Western Finance Association, Sun Valley, Idaho, June 21-24, 2000, discussant.
- Review of Economic Studies Conference, Frankfurt, Germany, June 30, 2000, "Contagion as a Wealth Effect."
- Federal Reserve Bank of Atlanta Conference, Atlanta, September 15, 2000, "Contagion as a Wealth Effect."
- Federal Reserve Bank of Atlanta Conference on E-Finance, October 14, 2000, discussant.
- Berkeley Program in Finance, Squaw Valley, CA, March 17, 2001, program discussant.
- ASSA Meetings, New Orleans, LA, January 6, 2001, "Contagion as a Wealth Effect."

## APPENDIX III CONTINUED..

- Q-Group, Tampa, FL, April 4, 2001, "Contagion as a Wealth Effect."
- Western Finance Assn., Tucson, AZ, June 22-23, 2001, session chair (Market Microstructure), discussant.
- New York Stock Exchange Conference, Institutional Trading, Palm Beach, FL, Dec. 6, 2001, session chair.
- Utah Winter Finance Conference, Salt Lake City, Utah, February 26-28, discussant.
- RFS Conference, Northwestern University, April 26-28, 2002, discussant.
- Federal Reserve Bank of Atlanta Conference on Venture Capital, Sea Island, GA, May 2-4, 2002, discussant.
- Conference in Honor of David Whitcomb, Rutgers University, October 11, 2002, discussant.
- SEC Roundtable Discussion on Market Transparency, November 12, 2002, participant.
- NYSE Roundtable Discussion on Market Quality Statistics, December 6, 2002, participant.
- ASSA Convention, Contagion, January 4, 2003, session chair.
- Utah Winter Finance Conference, February 6, 2003, discussant.
- FRB Atlanta Conference on Business Method Patents, Sea Island, GA, April 3, 2003, discussant.
- NBER Market Microstructure Meeting, Chicago, April 12, 2003, discussant.
- ASSA, San Diego, January 5, 2004, discussant.
- Utah Winter Finance Conference, February 5, 2004, discussant.
- Duke/NYSE Conference on International Cross-Listings, Sarasota, FL, March 11-13, Duke GCMC representative.
- New York Stock Exchange Conference, Market Microstructure, Palm Beach, FL, December 12, 2003, panel on market microstructure.
- FRB Atlanta Conference on Market Transparency, Sea Island, GA, April 15, 2004, discussant.
- 2004 HKUST Finance Symposium, Hong Kong, "A Two-Factor Model of Value and Growth with Adjustment Costs," December 13, 2004.
- Keynote Speaker, Twelfth Annual Conference on The Theories and Practices of Securities Markets, National Sun Yat-sen University, Kaohsiung, Taiwan, "Insider Trading and Corporate Governance," December 17, 2004.
- ASSA, Philadelphia, January 8, 2005, discussant.
- Utah Winter Finance Conference, February 10, 2005, discussant.
- Assurant/Georgia Tech International Finance Conference, Assurant Lecture, "Market Microstructure and Rational Expectations: A Primer," April 8, 2005.
- Oxford Finance Summer Symposium, "A Two-Factor Model of Value and Growth with Adjustment Costs," June 15, 2005.
- Conference on Information and Behavioral Biases in Financial Markets, Fundación Ramón Areces, Madrid, "An Intertemporal Asset Pricing Model with Strategic Informed Trading and Risk-Averse Market Makers," July 8, 2005.
- Oxford Summer Finance Symposium, "A Two-Factor Model of Value and Growth," June 16, 2005.
- Conference on Information and Behavioral Biases in Financial Markets, Madrid, Spain, "An Intertemporal Asset Pricing Model with Strategic Informed Trading and Risk-Averse Market Makers," July 7, 2005.
- Alpha Strategies Conference on Quantitative Money Management, commentator, April 10-12, 2006.
- Clarendon Lectures in Finance "Stock Price Dynamics and Industry Equilibrium," June 12-14, 2006.
- LSE Conference on New Directions in Asset Pricing and Risk Management, "Dynamic Strategic Informed Trading with Risk-Averse Market Makers," June 16, 2006.
- Western Finance Association, session chair, discussant, June 21-22, 2005.
- European Summer Symposium in Financial Markets, Gerzensee, Switzerland, focus session chair, July 24-28, 2006.

## APPENDIX III CONTINUED..

### INVITED UNIVERSITY RESEARCH SEMINARS

- School of Organization and Management, Yale University, March 1982.
- New York University, April 1983.
- Australian National University, October 1983.
- University of New England, Armidale, NSW, Australia, October 1983.
- Australian Graduate School of Management, University of New South Wales, October 1983.
- Centre of Policy Studies, Monash University, Melbourne, August 1983 and November 1983.
- School of Organization and Management, Yale University, March 1984.
- Columbia University Business School, April 1984.
- University of Rochester, April 1984.
- NBER Trade Group, April 1984.
- NBER Financial Markets Group, November 1984.
- Harvard Business School, May 1985.
- University of Chicago Business School, May 1985.
- Kellogg Graduate School of Management, Northwestern University, May 1985.
- Sloan School, MIT, October 1985.
- Graduate School of Business, Stanford University, March 1986.
- Graduate School of Management, Rutgers University, April 1986.
- Columbia University Business School, September 1986.
- GSIA, Carnegie-Mellon University, September, 1986.
- University of Chicago Business School, October 1986.
- Kellogg Graduate School of Management, Northwestern University, October 1986.
- School of Business, Washington University, St. Louis, February, 1987.
- Graduate School of Management, Rutgers University, February 1987.
- Graduate School of Business, Stanford University, January 1987.
- School of Business, University of California, Berkeley, January 1987.
- School of Management, Rice University, February 1987.
- Business School, University of Michigan, February 1987.
- Business School and Economics, University of Wisconsin, February 1987.
- Economics Department, University of Pittsburgh, February 1987.
- Wharton Business School, University of Pennsylvania, February 1987.
- Economics Department, Brown University, February 1987.
- School of Organization and Management, Yale University, April 1987.
- Economics Department, Virginia Polytechnic Institute, June 1987.
- UCLA Business School, May 20, 1988 "Smart Money, Noise Trading, and Stock Price Behavior."
- University of California, Santa Cruz, Economics Department, October 25, 1988, "Dealer Markets and Organized Exchanges."
- Anderson School of Management, University of New Mexico, November 18, 1988 "Dealer Markets and Organized Exchanges."
- Bocconi University, Milan Italy, "Asymmetric Information and Market Microstructure," May 25, 1989.
- Commodity Futures Trading Commission, November 1989.
- University of British Columbia, Finance Seminar, December 1989, "Noise Trading and Takeovers."
- Vanderbilt University, Finance Seminar November 1989, "Noise Trading and Takeovers."
- University of Utah, Finance Seminar, December 1989. "Intertemporal Insider Trading..."
- University of Indiana, Finance Seminar, September 1990. "Intertemporal Insider Trading..."
- Ecole Nationale des Ponts et Chaussees, Paris Finance Seminar, January 1991. "Intertemporal Insider Trading..."

## APPENDIX III CONTINUED..

- University of North Carolina, February 18, 1992. "Intertemporal Insider Trading With Smooth Order Flow."
- Northwestern University, Kellogg Graduate School of Management, June 3-4, 1992. "Intertemporal Insider Trading With Smooth Order Flow."
- New York University, September 22, 1993. "Speculation Duopoly..."
- UCLA, November 5, 1993. "Speculation Duopoly..."
- Vanderbilt University, April 14, 1995. "Speculation Duopoly..."
- University of Michigan, December 6, 1996. "Speculation Duopoly with Agreement to Disagree."
- Rice University, October 1, 1999, "Contagions as a Wealth Effect of Financial Intermediaries."
- Sydney University, Sydney, Australia, November 2, 1999, "Contagion as a Wealth Effect of Financial Intermediaries."
- Carnegie Mellon University, GSIA, February 23, 2001, "Contagion as a Wealth Effect."
- Stanford University, Graduate School of Business, March 14, 2001, "Contagion as a Wealth Effect."
- University of California, Berkeley, Haas School of Business, March 15, 2001, "Contagion as a Wealth Effect."
- University of Indiana, April 27, 2001, "Contagion as a Wealth Effect."
- London School of Economics, May 9, 2001, "Contagion as a Wealth Effect."
- University of Texas, Austin, October 26, 2001, "Continuous Speculation with Overconfident Traders."
- Norwegian School Of Management, Oslo, June 5, 2002, "Continuous Trading with Heterogeneous ...."
- Humboldt University, Berlin, June 7, 2002, "Continuous Trading with Heterogeneous Beliefs ...."
- Oxford Summer Finance Institute, June 11, 2002, "Continuous Trading with Heterogeneous Beliefs and No Noise Trading."
- Oxford Summer Finance Institute, June 12, 2003, "Corporate Finance and Industrial Organization."
- New York University, "Strategic Acquisitions ...", November 5, 2003.
- University of Virginia, "Prospect Theory ...", February 14, 2003.
- INSEAD, Paris, "Strategic Acquisition ...", April 2, 2004.
- HEC, Paris, "Strategic Acquisitions ...", April 1, 2004.
- University of Amsterdam, "Strategic Acquisitions ...", March 30, 2004.
- University of Tilburg, "Strategic Acquisitions ...", March 29, 2004.
- University of Pompeu Fabri, Barcelona, "Strategic Acquisitions ...", March 24, 2004.
- Princeton University, "Strategic Acquisitions ...", March 3, 2004.
- University of Maryland, "Strategic Acquisitions ...", April 23, 2004.
- Federal Reserve Board, Washington, DC, "Strategic Acquisitions ..." August, 17, 2004.
- Baruch College, CUNY, "Strategic Acquisitions and Investments in a Duopoly Patent Race Under Uncertainty" November 17, 2004.
- INSEAD Singapore, "Value and Growth ...", December 7, 2004.
- National University of Singapore, "A Two-Factor Model of Value and Growth with Adjustment Costs," December 9, 2004.
- University of Maryland, "A Two-Factor Model of Value and Growth with Adjustment Costs," May 9, 2005.
- Imperial College, London, "A Two-Factor Model of Value and Growth ...", May 11, 2006.
- Warwick University, "Strategic Trading with Risk Averse Market Makers," May 31, 2006.

## Scope and Methodology

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We conducted this performance audit in accordance with Generally Accepted Government Auditing Standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

**Scope.** We performed our audit from April 2008 to August 2008. Our audit scope included a review of the CSE and Broker-Dealer Risk Assessment program, as requested. Although our audit scope focused on TM's oversight of the CSE firms, we also considered the role of other Commission divisions and offices (for a Commission wide perspective) in the oversight of the CSE firms.

Our scope emphasized the CSE firms (especially Bear Stearns) that do not have a principal regulator because the Commission has much greater oversight responsibility for these firms. Our period of review was from October 2002 until August 2008. However, it varied depending on the nature of the issue. The scope of our review considered when:

- Bear Stearns collapsed;
- The subprime mortgage crisis started to become apparent (based on our audit work, we used December 2006);
- Two of Bear Stearns' managed hedge funds collapsed; and
- The CSE program began and the Commission issued the Order for the particular firm.

Lastly, our scope either did not include or was limited in the following areas:

- We completed our audit fieldwork prior to September 15, 2008 when Lehman Brothers announced it would file for bankruptcy protection and Bank of America announced that it agreed to acquire Merrill Lynch & Co. As a result, our fieldwork did not emphasize these firms, unlike Bear Stearns;
- We did not evaluate the effect(s), if any, that mark to market (*i.e.*, "fair value") accounting had on the valuation of mortgage securities and the ensuing write-downs which subsequently caused the firms to raise capital;
- We did not evaluate the role of rating agencies in the securitization process of mortgage loans;



## APPENDIX IV CONTINUED..

- We did not visit the CSE firms and perform an independent assessment of the firm's risk management systems (e.g., internal controls, models, etc.), or their financial condition (e.g., compliance with capital and liquidity requirements). As a result, we may not have identified certain findings and recommendations (i.e., improvements);
- We did not determine (i.e., recalculate and determine the accuracy) of the capital and liquidity data provided by the CSE firms to TM. OCIE and TM performed some inspection testing on the financial data during the application inspection. Also, the Financial Industry Regulatory Authority (FINRA) routinely performs inspection testing on the registered broker-dealers capital calculation;
- We did not determine the cause of Bear Stearns' collapse. For instance, some individuals have speculated that short sellers may have caused Bear Stearns' collapse by intentionally spreading false rumors. This issue is beyond the scope of this audit;
- The CSE program consists of four interrelated activities: an application process, inspections, the review of required filings, and periodic meetings with CSE staff.<sup>193</sup> We performed limited testing on some of these processes, as discussed below.<sup>194</sup>
  - TM relies mainly on meetings with the CSE staff to administer the CSE program. As a result, we viewed compliance testing in this area to have limited value; instead we (our expert, primarily) focused on the substance of these meetings. Thus, we excluded the meeting process from our compliance testing; and
  - In March 2007, in response to a GAO audit report (as discussed in the Prior Audit Coverage of this Appendix); Chairman Cox decided to transfer inspection responsibility from OCIE to TM (responsibility was transferred to TM in March 2007 for four of the five firms, and for the last firm (Morgan Stanley) following the completion of the ongoing OCIE exam of that firm in September 2007). OCIE retained within the Commission, the responsibility for conducting inspections on the CSE's broker-dealers. TM had not completed any of these inspections as of mid-September 2008. As a result, we only performed limited compliance testing on TM's inspection process. Instead, we emphasized the design of the TM inspection program;
- The Congressional request also asked the OIG to investigate the closing of a Commission enforcement investigation involving Bear Stearns. This

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<sup>193</sup> Source: SEC [Commission] Holding Company Supervision Program Description. Commission. 5 June 2008. <<http://www.sec.gov/divisions/marketreg/hcsupervision.htm>>.

<sup>194</sup> The purpose of our testing was to determine whether the CSE program is compliant with its policies and procedures and the CSE rule.

## APPENDIX IV CONTINUED..

issue is beyond the scope of this audit, but is the subject of a separate investigative report; and

- The role of federal regulators (e.g., the U.S. Department of Treasury) in the sale of Bear Stearns to JP Morgan is beyond the scope of this audit.

**Methodology.** Our methodology included reviewing required filings, inspection reports, and documentation surrounding periodic meetings between TM and CSE staff. We also reviewed other types of supporting documentation such as TM's policies and procedures, prior GAO audit reports, newspaper articles, etc. We also conducted interviews with staff from the Commission, CSE firms, GAO, and the FRBNY.

Lastly, we hired a contractor (*i.e.*, an expert) to provide us with technical expertise.<sup>195</sup> The expert reviewed the adequacy of TM's review of models, scenario analysis, etc; as well as, the associated internal risk management controls. We have incorporated the expert's opinions, findings, and recommendations into this audit report. The expert focused his review on the Commission's oversight of Bear Stearns.

**Internal/Management Controls.** We did not review management controls because they did not pertain to the audit's objectives. However, we identified several improvements in the CSE program's internal controls (e.g., tracking of issues).

**Use of Computer-Processed Data.** We relied on data from the Commission's Broker-Dealer Risk Assessment (BDRA) computer system. Firms use the BDRA system to electronically transmit filings (and BDRA stores the filing) to TM. The BDRA system does not process any of the data contained in the filings. As a result, we considered the relevant risks to be:

- TM's failure to receive a filing sent by a firm; and
- Whether information in the BDRA system could be compromised (information security risks).

We did not identify any instances where TM failed to receive a filing that a CSE firm transmitted through the system. However, TM told us about situations where firm filings made under the Broker-Dealer Risk Assessment program did not completely transmit to TM through the BDRA system. Given how we used the BDRA data in this audit, if a similar situation occurred with the CSE filings, we would have been aware because the firms transmit the filings at known intervals (e.g., month end).

We considered the risk surrounding information security. The Commission's Office of Information Technology recently certified and accredited the BDRA

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<sup>195</sup> See Appendix III for our expert's (Albert "Pete" Kyle) Curriculum Vitae.

## APPENDIX IV CONTINUED..

system, as required by the Federal Information Security Management Act of 2002. Therefore, we believe that we can rely upon the information in the BDRA system as it pertains to information security.

We identified a few issues with the BDRA system, but they do not affect the reliability of the data. We discuss the issues in our related audit report (No. 446-B).

**Judgmental Sample.** We judgmentally selected twenty issues that TM or OCIE staff identified for our testing on TM's tracking of material issues (see Report Finding No. 5). Our sample included issues from all the CSE firms including those with principal regulators, although our audit work emphasized Bear Stearns. We generally selected specific issues such as an internal control weakness, as opposed to more generic issues (e.g., exposure to subprime). We selected samples from:

- The TM action memo recommending that the Commission issue the Order;
- OCIE inspection reports; and<sup>196</sup>
- The monitoring staff's monthly memoranda (which discuss significant issues) to senior TM management.

Although we believe that our sampling methodology is reasonable and representative, our results should not be projected onto the universe of issues.

**Use of Technical Assistance.** We received technical assistance from an expert, as discussed in the Methodology section of this Appendix. His expertise is described in his Curriculum Vitae in Appendix III.

**Prior Audit Coverage.** GAO Report Financial Market Regulation: Agencies Engaged in Consolidated Supervision Can Strengthen Performance Measurement and Collaboration, GAO Report 07-154, dated March 15, 2007 on strengthening performance measurement and collaboration for the agencies (i.e., the Federal Reserve, Commission, and the Office of Thrift Supervision (OTS)) involved in consolidated supervision. They made several recommendations involving the Commission:

GAO Recommendation: To better assess the Commission's achievements, the Chairman of the Commission should direct his staff to develop program objectives and performance measures that are specific to the CSE program.

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<sup>196</sup> We did not use TM's inspection reports because they had not completed any inspections (as of when we performed our testing) since the Chairman transferred (from OCIE to TM) the inspection authority for the consolidated entity. Lastly, TM has implemented an automated method to track the inspection issues (i.e., findings).

## APPENDIX IV CONTINUED..

The Commission has developed program objectives and performance measures. These documents are available on the Commission's website.<sup>197</sup>

GAO Recommendation: To ensure they are promoting consistency with primary bank and functional supervisors and are avoiding duplicating the efforts of these supervisors, the Chairman of the Federal Reserve, the Director of the OTS, and the Chairman of the Commission should also direct their staffs to identify additional ways to more effectively collaborate with primary bank and functional supervisors. Some of the ways they might consider accomplishing this include:

- Ensuring common understanding of how the respective roles and responsibilities of primary bank and functional supervisors and of consolidated supervisors are being applied and defined in decisions regarding the examination and supervision of institutions; and
- Developing appropriate mechanisms to monitor, evaluate, and report jointly on results.

In response to Bear Stearns' collapse, the Commission and the Federal Reserve have agreed on a MOU involving coordination and information sharing.

GAO Recommendation: To take advantage of the opportunities to promote better accountability and limit the potential for duplication and regulatory gaps, the Chairman of the Federal Reserve, the Director of OTS, and the Chairman of the Commission should foster more systematic collaboration among their agencies to promote supervisory consistency, particularly for firms that provide similar services. In particular, the Chairman of the Commission and the Director of the OTS should jointly clarify accountability for the supervision of the CSEs that are also thrift holding companies and work to reduce the potential for duplication.

The Chairman and the Director of OTS are still discussing the jurisdictional issues raised by the recommendation. This issue was recently discussed at a Congressional hearing.<sup>198</sup>

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<sup>197</sup> Source: SEC [Commission] Holding Company Supervision Program Description. Commission. 5 June 2008. <<http://www.sec.gov/divisions/marketreg/hcsupervision.htm>>.

<sup>198</sup> Source: Risk Management and its Implications for Systemic Risk Before the U.S. Senate Subcommittee on Securities, Insurance, and Investment on Banking, Housing, and Urban Affairs, 110<sup>th</sup> Cong. (June 19, 2008). SEC's Oversight of Bear Stearns and Related Entities: The CSE Program Report No. 446-A. September 25, 2008

## APPENDIX IV CONTINUED..

GAO Recommendation: The Chairman of the Commission should direct the staff to develop and publicly release explicit written guidance for supervision of CSEs. This guidance should clarify the responsibilities and activities of the OCIE and TM's responsibilities for administering the CSE program.

The Chairman transferred the inspection authority of the consolidated entity from OCIE to TM.<sup>199</sup> However, as discussed in the audit report, TM and OCIE can still improve collaboration. Lastly, the Commission developed and publicly released written guidance describing the CSE program (e.g., TM's roles and responsibilities).

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2008) (statement of Erik Sirri, Director of TM, Commission).

<sup>199</sup> The transfer was in response to a GAO audit report (Financial Market Regulation: Agencies Engaged in Consolidated Supervision Can Strengthen Performance Measurement and Collaboration, Report 07-154, March 15, 2007) recommendation. In response to the report Chairman Cox told GAO: "To implement this recommendation, I have carefully considered the question of which organizational structure will best achieve the goal of the CSE program. I have concluded that the success of the CSE program will be best ensured if the supervision of the CSE firms is fully integrated with, rather than merely coordinated with, the detailed onsite testing that is done of the documented controls at CSE firms. As a result, I have decided to transfer responsibility for on-site testing of the CSE holding company controls to the Division of Market Regulation [now called TM]. This will better align the testing and supervision components of the CSE program, will strengthen its prudential character, and will most efficiently utilize the Commission's resources. With the new structure, ongoing supervision activities will be more directly informed by the results of focused testing of controls, and field inspections will be more precisely targeted using information from ongoing supervisory work. In addition, the Commission's expertise related to the prudential supervision of securities firms will be concentrated in the Division of Market Regulation, which will foster improved communication and coordination among the staff responsible for administering various components of the CSE program." The Chairman made his decision after carefully evaluating proposals from TM and OCIE, and after consulting with the four other Commissioners, who unanimously supported the decision to consolidate CSE oversight under TM.

## List of Recommendations

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**Recommendation 1:**

The Division of Trading and Markets, in consultation with the Board of Governors of the Federal Reserve System and the Basel Committee should: (1) reassess the guidelines and rules regarding the Consolidated Supervised Entity (CSE) firms' capital levels; and (2) identify instances (*e.g.*, a firm's credit rating is downgraded, or its unsecured debt trades at high spreads over Treasuries) when firms should be required to raise additional capital, even if the firm otherwise appears to be well capitalized according to CSE program requirements.

**Recommendation 2:**

The Division of Trading and Markets, in consultation with the Board of Governors of the Federal Reserve System, should reassess pillar 2 of the Basel II framework and the Consolidated Supervised Entity (CSE) program guidelines regarding liquidity and make appropriate changes to the CSE program's liquidity requirements. Changes should describe assumptions CSE firms should be required to make about availability of secured lending in times of stress (including secured lending from the Federal Reserve) and should spell out circumstances in which CSE firms should be required to increase their liquidity beyond levels currently contemplated by CSE program liquidity requirements.

**Recommendation 3:**

The Division of Trading and Markets should ensure that it adequately incorporates a firm's concentration of securities into the Consolidated Supervised Entity (CSE) program's assessment of a firm's risk management systems (*e.g.*, internal controls, models, etc.) and more aggressively prompts CSE firms to take appropriate actions to mitigate such risks.

**Recommendation 4:**

The Division of Trading and Markets, in consultation with the Board of Governors of the Federal Reserve System, should reassess the Consolidated Supervised Entity (CSE) program's policy regarding leverage ratio limits and make a determination as to whether, and under what circumstances, to impose leverage ratio limits on the CSEs.

## APPENDIX V CONTINUED..

### **Recommendation 5:**

The Division of Trading and Markets (TM) should ensure that: (1) the Consolidated Supervised Entity (CSE) firms have specific criteria for reviewing and approving models used for pricing and risk management, (2) the review and approval process conducted by the CSE firms is performed in an independent manner by the CSEs' risk management staff, (3) each CSE firms' model review and approval process takes place in a thorough and timely manner, and (4) impose limits on risk taking by firms in areas where TM determines that risk management is not adequate.

### **Recommendation 6:**

The Division of Trading and Markets should be more skeptical of Consolidated Supervised Entity firms risk models and work with regulated firms to help them develop additional stress scenarios that may or may not have been contemplated as part of the prudential regulation process.

### **Recommendation 7:**

The Division of Trading and Markets (TM) should be involved in formulating action plans for a variety of stress or disaster scenarios, even if the plans are informal, including plans for every stress scenario that the Consolidated Supervised Entity (CSE) firms use in risk management, as well as plans for scenarios that TM believes might happen but are not incorporated into CSE firms' risk management.

### **Recommendation 8:**

The Division of Trading and Markets should take steps to ensure that mark disputes do not provide an occasion for Consolidated Supervised Entity firms to inflate the combined capital of two firms by using inconsistent marks.

### **Recommendation 9:**

The Division of Trading and Markets should encourage the Consolidated Supervised Entity (CSE) firms to present VaR and other risk management data in a useful manner, which is consistent with how the CSE firms use the information internally and which allows risk factors to be applied consistently to individual desks.

### **Recommendation 10:**

The Division of Trading and Markets should ensure that the Consolidated Supervised Entity take appropriate valuation deductions for illiquid, hard-to-value assets and appropriate capital deductions for stressed repos, especially stressed repos where illiquid securities are posted as collateral.

## APPENDIX V CONTINUED..

### **Recommendation 11:**

The Division of Trading and Markets (TM), in consultation with the Chairman's Office, should discuss risk tolerance with the Board of Directors and senior management of each Consolidated Supervised Entity (CSE) firm to better understand whether the actions of CSE firm staff are consistent with the desires of the Board of Directors and senior management. This information would enable TM to better assess the effectiveness of the firms' risk management systems.

### **Recommendation 12:**

The Division of Trading and Markets should require compliance with the existing rule that requires external auditors to review the Consolidated Supervised Entity firms' risk management control systems or seek Commission approval in accordance with the Administrative Procedures Act<sup>200</sup> for this deviation from the current rule's requirement.

### **Recommendation 13:**

The Division of Trading and Markets should ensure that reviews of a firm's Contingency Funding Plan include an assessment of a Consolidated Supervised Entity firm's internal and external communication strategies.

### **Recommendation 14:**

The Division of Trading and Markets should develop a formal automated process to track material issues identified by the monitoring staff to ensure that they are adequately resolved. At a minimum, the tracking system should provide the following information:

- The source of the issue;
- When the issue was identified;
- Who identified the issue;
- The current status of the issue (e.g., new developments);
- When the issue was resolved; and
- How the issue was resolved.

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<sup>200</sup> The Administrative Procedures Act (5 U.S.C. §500 *et. seq.*) sets forth the basic procedural requirements for agency rulemaking. It generally requires (1) publication of a notice of proposed rulemaking in the *Federal Register*, (2) opportunity for public participation in rulemaking by submission of written comments, and (3) publication of a final rule and accompanying statement of basis and purpose not less than 30 days before the rule's effective date.



## APPENDIX V CONTINUED..

### **Recommendation 15:**

The Division of Trading and Markets should: (1) reassess all the prior Office of Compliance Inspections and Examinations (OCIE) issues to ensure that no significant issues are unresolved (given the belief that OCIE followed up); and (2) follow up on all significant issues.

### **Recommendation 16:**

The Division of Trading and Markets should ensure that they complete all phases of a firm's inspection process before recommending that the Securities and Exchange Commission allow any additional Consolidated Supervised Entity firms the authority to use the alternative capital method.

### **Recommendation 17:**

The Divisions of Corporation Finance (CF) and Trading and Markets (TM) should take concrete steps to improve their collaboration efforts and should determine whether TM's information on the Consolidated Supervised Entity (CSE) firms could be used by CF in its review of the CSE firms.

### **Recommendation 18:**

The Division of Trading and Markets (TM) and the Office of Compliance Inspections and Examinations (OCIE) should develop a collaboration agreement (e.g., discussing information sharing) that maintains a clear delineation of responsibilities between TM and OCIE with respect to the Consolidated Supervised Entity program. They should inform the Chairman's Office of any disagreement(s) so that the issue(s) can be resolved.

### **Recommendation 19:**

The Division of Trading and Markets and the Office of Risk Assessment should develop an agreement outlining their roles and responsibilities, as well as methods for information sharing such as communicating project results. These two offices should inform the Chairman's Office of any disagreement(s) so that the issue(s) can be resolved.

### **Recommendation 20:**

The Division of Corporation Finance should: (1) develop internal guidelines for reviewing filings in a timely manner, and (2) track and monitor compliance with these internal guidelines.

### **Recommendation 21:**

The Division of Corporation Finance (CF) should (1) establish a policy outlining when firms are expected to substantively respond to issues raised in CF's comment letters, and (2) track and monitor compliance with this policy.

## APPENDIX V CONTINUED..

### **Recommendation 22:**

Chairman Cox should create a Task Force led by the Office of Risk Assessment (ORA) with staff from the Divisions of Trading and Markets, and Investment Management, and the Office of Compliance Inspections and Examinations. The Task Force should perform an analysis of large firms with customer accounts that hold significant amounts of customer funds and have unregulated entities, to determine the costs and benefits of supervising these firms on a consolidated basis. If the Task Force ultimately believes that the Securities and Exchange Commission (Commission) should supervise these firms on a consolidated basis, it should make a recommendation to the Commission that involves seeking the necessary statutory authority to oversee these firms on a consolidated basis.

### **Recommendation 23:**

The Division of Trading and Markets, in consultation with the Chairman's office, should determine what additional changes need to be made to the Consolidated Supervised Entity (CSE) program in light of the collapse of Bear Stearns and changing economic environment.

### **Recommendation 24:**

The Division of Trading and Markets (TM) should fill critical existing positions, and consider what any additional staff it believes will be needed to carry out the CSE program's function going forward. TM should also establish milestones for completing each phase of an inspection and implement a procedure to ensure that the milestones are met.

### **Recommendation 25:**

The Division of Trading and Markets, in consultation with the Office of Compliance Inspections and Examinations and the Commission's Ethics office, should develop an ethics manual.

### **Recommendation 26:**

The Division of Trading and Markets should continue to seek out ways to increase its communication, coordination, and information sharing with the Federal Reserve and other Federal Regulators.

## Chairman Cox's Comments

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September 25, 2008

### MEMORANDUM

**TO:** H. David Kotz  
Inspector General

**FROM:** Christopher Cox  
Chairman

**SUBJECT:** Draft Report on *SEC's Oversight of Bear Stearns and Related Entities: The Consolidated Supervised Entities Program*

Thank you for the opportunity to review the Draft Report on *SEC's Oversight of Bear Stearns and Related Entities: The Consolidated Supervised Entities Program*. I welcome your report and recommendations on the CSE program.

There is much value that the agency can take from an independent and arms-length review of its programs, and your report provides an invaluable and fresh perspective for the agency to carefully review and consider. The staff of the Division of Trading and Markets and the Division of Corporation Finance, who as you know have been working around the clock for months in the current market turmoil, have provided detailed comments on specific aspects of the analysis in the report. As head of the agency, I would like to address your major findings and recommendations.

Your report makes 26 specific recommendations to improve the CSE program, all of which are well-considered and worthy of support. Some of these recommendations had already been undertaken and many will have potential applicability beyond the CSE program.

Your report also underscores the fundamental flaw with the CSE program that I have reported to the Congress on several occasions in recent months: voluntary regulation does not work. When Congress passed the Gramm-Leach-Bliley Act, it failed to give the SEC or any agency the authority to regulate certain large investment bank holding companies. Because of the lack of explicit statutory authority for the Commission to regulate the large investment bank holding companies, the Commission in 2004 created a voluntary program, the Consolidated Supervised Entities program, in an effort to fill this regulatory gap.

## APPENDIX VI CONTINUED..

The inherent weakness of the CSE program from the beginning was that investment banks could opt in or out of supervision voluntarily. The program had no explicit statutory authority to require these investment bank holding companies to report their capital, maintain liquidity, or submit to leverage requirements. The fact that investment bank holding companies could withdraw from this voluntary supervision at their discretion diminished the perceived mandate of the CSE program, and weakened its effectiveness in a number of ways.

Lacking a statutory mandate to regulate these investment bank holding companies, the CSE program was patterned after the regulation of commercial bank holding companies. It used the capital and liquidity measurement approaches from the commercial banking world — with unfortunate results.

Thus, as your report confirms, at the time of its near-failure Bear Stearns had a capital cushion well above what was required to meet supervisory standards calculated under the internationally-accepted Basel framework and the Federal Reserve's "well capitalized" standard for bank holding companies.

Your report also highlights the consequences of a critical issue that existed throughout the financial services sector. Prior to the spring of 2008, the bank risk models in use throughout the U.S., including those relied upon by the CSE firms, did not include scenarios premised on a total mortgage meltdown on a scale so devastating that it would cause the failure of Fannie Mae and Freddie Mac. Throughout this year, national and international banking regulators have worked to strengthen and improve the capital and liquidity standards that are used throughout the banking system. The SEC has been a leader in this process through institutions like the Basel Committee on Banking Supervision, the Senior Supervisors Group, the Financial Stability Forum, and the International Organization of Securities Commissions. Those efforts are ongoing and vital.

I am pleased that the SEC has already undertaken several of the actions listed in your recommendations, and look forward to working with you to implement others. Thank you for your role in helping to ensure that the SEC is faithfully executing its mission to protect investors, facilitate capital formation, and maintain fair and orderly markets.

## Management's Comments

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### DIVISION OF TRADING AND MARKETS MANAGEMENT COMMENTARY

The Division of Trading and Markets ("Division") appreciates the opportunity to comment on the Office of Inspector General ("OIG") Report "SEC's Oversight of Bear Stearns and Related Entities: The Consolidated Supervised Entity Program" ("OIG Report"). This comment process is of critical importance to the Division because previous modes of feedback to OIG have proven ineffective in correcting what the Division believes are factual errors and unsupported conclusions. This OIG Report therefore becomes the mechanism by which the Division can attempt to set the record straight.

We believe the OIG Report is fundamentally flawed in its process, premises, analysis, and key findings. The Division understands the importance of an active and independent OIG, and supports full and fair investigations of matters by the OIG. However, with respect to this OIG Report, the Division's calls to correct mistakes, misunderstandings, and misrepresentations have had limited effect on the final document. It is our view that the resulting OIG Report starts from incorrect assumptions and reaches inaccurate, unrealistic, and impracticable conclusions.

Few would argue that the demise of Bear Stearns was a significant event for the U.S. financial markets. This demise deserves a careful analysis to assess its causes and to prescribe future actions. This OIG Report does not provide such an analysis; rather, it attempts to explain Bear's collapse in nutshell fashion. The Division believes that the OIG Report is flawed in several respects.

As a threshold matter, the Division believes it was not provided with a fair and meaningful process to address the issues raised in the OIG Report. In particular:

- OIG failed to interview the Division's senior management. Senior managers were in a position to address many of the concerns raised in the OIG Report and provide information that OIG could not obtain from staff workpapers.
- OIG did not interview Bear Stearns managers regarding critical aspects of the OIG Report. Firm management constitutes a primary source of information that could serve to meaningfully support or refute a number of the OIG Report's statements about the Division's CSE supervision of the firm. Such a cross-check and verification should be incorporated in such a OIG Report.
- OIG's expert spent only three hours with Division staff before preparing his portions of the OIG Report. The issues associated with supervision of a complex firm such as Bear Stearns cannot be evaluated without developing a context for the information. Without the benefit of conversations with Division staff, such context is missing and the OIG's conclusions are destined to lack proper foundations.

## APPENDIX VII CONTINUED..

- Large portions of OIG's Report – and in particular the portion prepared by the OIG expert – rely extensively, if not exclusively, on information contained in informal Division staff memoranda that recorded notes, not final conclusions, and do not represent all the facts or work performed by Division staff. These notes were not a final work product and were not even circulated to the Division's senior management.
- The OIG Report cites staff notes out of context, giving the impression that the Division, at some point, shared such views but failed to act prudently. The OIG Report should have distinguished between its own findings and opinions, and those of Division staff.
- The OIG Report's assessments contain numerous factual and analytical errors, and weakly supported conclusions, perhaps reflective of the process used and the tight time, informational, and resource constraints under which it was prepared. Each error is, in and of itself, understandable. Untangling capital from liquidity, market risk from funding risk, risk weighted assets from less liquid assets, is difficult even for many practitioners and regulators involved in day-to-day consideration of the issues. Unfortunately, the cumulative effect of the errors led to less informed and more assertive conclusions than would have been the case had the process had the luxury of more time and greater resources.

This process has produced findings that are materially in error, including the following:

- As the Division has expressly informed OIG in informal comments, CSE holding companies are not subject to a capital requirement – they are required to report a capital ratio calculated under the Basel II Standard.
- As the Division has expressly informed OIG in informal comments, paragraph 777 of the Basel II Standard, quoted in the OIG Report, describes requirements related to credit risk. Yet the text of the OIG Report cites this paragraph to make an argument that the Standard was applied imprudently with respect to market risk concentrations.
- As the Division has expressly informed OIG in informal comments, the OIG Report improperly criticizes CSE oversight, noting "that pricing at Bear Stearns was based more on looking at trading levels in the market than on looking at models." Marking positions based upon recent trading activity is a higher valuation standard in the accounting literature and should be used above marks produced by models.

This OIG Report considers an isolated set of data about Bear Stearns, yet it makes sweeping statements and comes to broad findings about the CSE program in general. In doing so, it does not consider the events in our markets following the collapse of Bear Stearns. Since that time, we have seen the failure of IndyMac bank, the bankruptcy of Lehman Brothers, the purchase of Merrill Lynch by Bank of America, the Federal government's explicit actions to guarantee Fannie Mae, Freddie Mac, the injection of Federal money into the insurance company AIG, the attempt by the U.S. Treasury to create a \$700B purchase facility for distressed

## APPENDIX VII CONTINUED..

assets from the financial sector, and the conversion of Morgan Stanley and Goldman Sachs to bank holding companies.

These events provide a rich context in which to consider the events of Bear Stearns. For example, early evidence suggests that for Merrill Lynch and Morgan Stanley, various clearing and agent banks held increasing amounts of collateral of the firm, draining their parent liquidity pool. For Morgan Stanley, following Lehman Brothers' bankruptcy, the reluctance of counterparties to trade with the remaining independent investment banks, and the increasingly unfavorable treatment they received at the hands of these counterparties with respect to collateral flows, drove them to seek bank holding company status. In recent weeks, Morgan Stanley dramatically increased its liquidity pool, only to find that this was not enough to see them through the crisis. Likewise, Goldman Sachs -- a firm also on very strong financial footings and without significant holdings of troubled assets -- which had an extensive liquidity pool, could not withstand these market forces.

This chain of events raises very significant questions about the supervision of all types of financial institutions, not just investment banks. For our part, the Division has engaged with domestic and international regulators in a concerted effort to answer what are very fundamental questions about how large and complex financial institutions should be supervised, capitalized, and kept liquid. With respect to Bear Stearns, the staff applied the relevant international standards for holding company capital adequacy in a conservative manner, and added a holding company liquidity requirement: and yet they could not withstand a "run-on-the-bank." Where the globally accepted standards required an eight foot high levee, Division staff raised a ten foot levee, which was of course little use in the face of a fifteen foot storm surge. The relevant question now is not whether the levees were high enough, because they clearly were breached. Rather, the central issue is whether levee systems, no matter how high, afford sufficient protection from the financial environment, or are additional measures needed to complement the levees?

In particular, there is widespread recognition that the international standards for holding company capital adequacy, relied upon by both commercial and investment banks, require revision. Also, new standards for liquidity need to be calibrated and applied to large institutions. There are many venues in which relevant discussions are progressing and where guidance will soon be issued. The Commission staff has been active in all of these, including the Senior Supervisors Group, the Basel Committee, the Financial Stability Forum, and the International Organization of Securities Commissions. Rather than wait for this collaborative work to be complete, however, the Division responded quickly to the collapse of Bear Stearns by requiring the remaining CSE firms to increase their liquidity pools, which already were significantly in excess of any applicable international standard.

Given continuing market events, we feel it is not possible to responsibly make the type of statements that were made in this OIG Report about the demise of Bear Stearns, and the role of the CSE program. We expect that after these data are analyzed with proper care and reflection, responsible lessons can be drawn. But the events subsequent to the failure of Bear Stearns strongly suggest that the

## APPENDIX VII CONTINUED..

statements made in this OIG report are premature at best. For our part, we believe that the key conclusions of the OIG Report are inaccurate and without empirical foundation.

### **OIG Report 446-A: SEC's Oversight of Bear Stearns and Related Entities: The Consolidated Supervised Entity Program**

**Please indicated your concurrence or non-concurrence with each recommendation that applies to your Division or Office.**

#### **Recommendation 1:**

The Division of Trading and Markets, in consultation with the Board of Governors of the Federal Reserve System and the Basel Committee should: (1) reassess the guidelines and rules regarding the Consolidated Supervised Entity (CSE) firms' capital levels; and (2) identify instances (e.g., a firm's credit rating is downgraded, or its unsecured debt trades at high spreads over Treasuries) when firms should be required to raise additional capital, even if the firm otherwise appears to be well capitalized according to CSE program requirements.

#### **Management Response (Concur or Non-concur):**

The Division of Trading and Markets concurs with this recommendation, even though we believe it is based on a fundamentally flawed understanding of the Bear Stearns crisis. Nonetheless, we have already undertaken efforts that respond to the recommendation,

Actions: Since Bear Stearns' failure, we have:

- Worked with the Basel Committee on Banking Supervision to amend capital adequacy standards for internationally active sophisticated institutions to deal explicitly with liquidity risk.
- Supported the work of the Basel Accord Implementation Group on "incremental default risk capital," which aims to supplement Value at Risk-based capital to ensure that "tail risk exposures" in the trading book are adequately capitalized.
- Developed and entered into a formal Memorandum of Understanding with the Federal Reserve to improve sharing of information and provide a mechanism for cooperation in supervision of CSEs.
- Jointly with the Federal Reserve, discussed with the senior management at each CSE firm its long-term funding plans, including plans for raising new capital by accessing the equity and long-term debt markets.
- Required public disclosure of capital adequacy measures computed under the Basel Standard.

Flawed Assumptions and Findings: TM believes that the OIG Report's findings are fundamentally flawed in the following ways:

- The OIG Report's exclusive focus on capital is misplaced. As explained in Commission public statements and testimony, Bear Stearns's failure was due to a run on liquidity, not capital. The primary reason that Bear failed was concerns by



## APPENDIX VII CONTINUED..

secured lenders that it would suffer greater losses in the future. These concerns caused secured lenders to stop providing financing, even on a fully-secured basis, despite the firm's compliance with applicable net capital requirements.

- The OIG Report misconstrues the nature of the Basel Standard. The CSE rules incorporate by reference the Basel Standard, the capital adequacy regime applicable to internationally active financial institutions, including commercial banks, on a global basis. The Basel II Standard is a capital ratio, not a capital requirement. However, the CSE program requires reporting of the capital ratio and incorporates the 10% Basel capital ratio threshold as constituting a "well-capitalized" institution consistent with the threshold used by banking supervisors. Falling below 10% triggers certain obligations on the firm, but because there is no capital requirement is not necessarily a "violation."
- At the time of its failure, the Bear Stearns holding company actually exceeded the Basel II "well-capitalized" standard, and Bear's primary broker-dealer maintained tentative net capital above \$5 billion.
- The OIG Report questions whether Bear's "capital requirement amounts were adequate," but the real issue is whether the international Basel standard that all international banking institutions rely on is sufficient.
- The OIG Report's assumptions regarding leverage based on the Pickard article are inaccurate.
  - The statement of Mr. Pickard, used in the OIG Report, is inapplicable to the relevant capital and liquidity requirements at Bear's holding company. The quotation appears to confuse holding company Basel II capital standards and broker-dealer net capital requirements.
  - Mr. Pickard's statement does not accurately reflect the letter and operation of the SEC's current net capital rule and has numerous analytical errors as a result. For instance, the CSE broker-dealers were not subject to an explicit 12x leverage standard before the CSE amendments, as implied by Mr. Pickard. The article says that broker-dealers were formerly subject to a leverage ratio limit of 12x net capital in computing minimum net capital, and this limit was removed by the net capital requirements applicable to broker-dealer subsidiaries of CSEs. (This limit is in the "aggregate indebtedness" method for calculating net capital.) However, CSE broker-dealers were not subject to this leverage limit even before the CSE net capital standard was created. These broker-dealers used an alternative capital standard that has been in the rule since 1975. Under this requirement, broker-dealers that carry customer accounts maintain minimum net capital equal to no less than two percent of "aggregate debit items", not the aggregate indebtedness standard referred to by Mr. Pickard. This alternative method to compute the minimum net capital requirement is applied by all the CSE broker-dealers and most

## APPENDIX VII CONTINUED..

other large broker-dealers. Under the "aggregate debit items" method for calculating net capital, a broker-dealer's ability to increase leverage is limited through the application of haircuts to proprietary positions rather than through the application of a leverage standard from the aggregate indebtedness standard.

- The OIG Report's conclusion regarding the interaction of capital and secured funding is misguided.
- In analyzing Bear Stearns's efforts to increase its relative reliance on secured rather than unsecured funding, the OIG Report states that this shift called into question "whether Bear had enough capital to sustain its business model." This statement focuses on capital -- not liquidity -- as the primary issue causing Bear's collapse, and TM believes it is fundamentally incorrect in concluding that such activity points to inadequate capital at Bear.
- Further, the OIG Report states that even though Bear had increased its reliance on secured funding, it was "unable to obtain" enough to save the firm in March. TM submits that Bear never would have been able to obtain enough funding because the firm was experiencing a run-on-the-bank by counterparties that provide secured funding.
- A firm's decision as to the form of funding is based on many factors such as term, diversification, collateral, stability of lender, maintaining relationships and cost. It was widely believed that secured funding was more stable and reliable than unsecured funding. Also, the cost of unsecured funding increased substantially for all financial institutions during and after the Summer of 2007. In these circumstances, it is understandable that many financial companies, including Bear, sought cheaper, more stable sources of financing through secured funding. Also important was the collapse of the securitization business. The high cost of funding was an effect of the collapse of securitization rather than its cause.
- The OIG Report incorrectly states, based on a review of informal staff notes and internal memoranda, that TM did not believe it had a mandate to compel Bear Stearns to raise additional capital if the firm's Basel II capital ratio was greater than 10%.
- As TM explained in informal comments, the CSE rules expressly and broadly state that the Commission can impose additional conditions on either the broker-dealer or the holding company if the Commission finds it necessary and appropriate in the public interest or for the protection of investors. See Exchange Act Rule 15c3-1e(e)(7). There are also specific conditions that would trigger Commission action. Exchange Act Rule 15c3-1e(e)(1)-(6).

## APPENDIX VII CONTINUED..

- TM has always believed and represented from the beginning of the CSE program that it had broad authority related to financial responsibility to mandate that a broker dealer and or its ultimate holding company raise capital or achieve the same end by reducing the balance sheet, as well as direct the firm in the sale of assets or customer accounts as the facts and circumstances may warrant.

### Background on the CSE Rules

TM believes that it is useful for the reader to understand certain fundamental features of the CSE rules. The CSE rules incorporate by reference the Basel Standard, the capital adequacy regime applicable to internationally active financial institutions, including commercial banks, on a global basis. The Commission has sought to apply this standard in a conservative manner, in particular with regard to charges for the positions held with trading intent, which are a significant share of those held overall by securities firms. Specifically, firms have been required to augment value-at-risk charges (VaR), computed using internally-developed statistical models, with fixed percentage haircuts. These additional haircuts are, in fact, a multiple of the value-at-risk charges, and so, are more conservative.

Because the Commission recognized that the primary risks to securities firms are those associated with funding, the CSE program imposed a liquidity requirement in addition to the Basel Standard. It is important to note that this requirement, which mandated firms hold significant pools of liquid assets, is not part of the Basel Standard.

In the wake of crises at Bear Stearns, Northern Rock, Countrywide, and a number of other institutions, the Basel Committee on Banking Supervision, which developed and promulgated the Basel Standard, has initiated a number of projects intended to modify the Basel Standard to reflect the lessons of recent events. TM staff has actively engaged in this effort at the behest of Chairman Cox. TM staff co-chair one Basel committee dealing with these issues, and participate in another, which are working to strengthen in a number of areas the capital standards applicable to internationally active institutions. The Basel Committee has expanded its work to include consideration of guidance, and perhaps explicit standards, regarding liquidity risk management for financial institutions. Here again, TM staff has been actively involved. So while the Commission staff believed that capital and liquidity standards applicable to CSEs were conservative relative to international norms prior to the collapse of Bear Stearns, they join other regulators in recognizing that further strengthening and expanding these standards to include liquidity is necessary in the wake of recent events.

### **Recommendation 2:**

The Division of Trading and Markets, in consultation with the Board of Governors of the Federal Reserve System, should reassess pillar 2 of the Basel II framework and the Consolidated Supervised Entity (CSE) program guidelines regarding liquidity and make appropriate changes to the CSE program's liquidity requirements. Changes should

## APPENDIX VII CONTINUED..

describe assumptions CSE firms should be required to make about availability of secured lending in times of stress (including secured lending from the Federal Reserve) and should spell out circumstances in which CSE firms should be required to increase their liquidity beyond levels currently contemplated by CSE program liquidity requirements.

### Management Response (Concur or Non-concur):

We concur with the recommendation, and have either already undertaken or already completed work that responds to the recommendation.

Since Bear's collapse we have:

- Worked with the Basel Committee on Banking Supervision to implement the Chairman's call for amended capital adequacy standards for internationally active sophisticated institutions to deal explicitly with liquidity risk.
- Jointly with the Federal Reserve, established new stress scenarios as a basis for sizing liquidity pool requirements based on the response to shorter, more extreme events entailing a substantial loss of secured funding, more severe liquidity outflows from prime brokerage activities and liquidity drains due to operations frictions such as in derivatives settlements and timing considerations related to margin postings.
- Jointly with the Federal Reserve, strengthened the liquidity requirements for CSE firms relative to their unsecured funding needs, and closely scrutinized the secured funding activities of each CSE firm, with a view to lengthening the average duration and broadening the diversity of all funding arrangements.

Like Recommendation 1, Recommendation 2 is fundamentally flawed, as it based on the same analysis. In addition, as we informed the OIG in our informal comments, the analysis is inaccurate in the following ways:

- The OIG Report's statement that the CSE program liquidity guidelines were inadequate because the time horizon for a liquidity crisis to unfold is likely to be less than the one-year period, and secured lending facilities are not automatically available in times of stress, presupposes that the loss of all secured funding was reasonably predictable. It also ignores the difficulty of providing adequate liquidity for this event.
- TM has stated clearly that its liquidity pool requirements, like those of other international and domestic regulators contemplating similar issues, did not anticipate a complete unwillingness of lenders to provide financing on quality assets (such as Treasuries or agency securities). This would include the availability of committed secured lending facilities.

## APPENDIX VII CONTINUED..

- From the standpoint of unsecured funding, applying a one year liquidity requirement to replace unsecured funding was itself a logical approach. The concept underlying the one-year liquidity requirement for unsecured funding was that, should a firm experience a severe event such that unsecured lenders decide on day one to cease lending, the firm would have a liquidity pool sized to allow it to replace the unsecured funding as it matured over a one-year period.
- The 60-day cash flow analysis is a different metric that provides the firm another perspective. It is a short-term cash flow analysis focused on a more acute event.
- Also, given that US and international credit markets have been in crisis for over a year, the one-year unsecured funding liquidity pool requirement remains relevant.
- The OIG Report's suggests that TM staff should have recognized that terminations of Bear's committed secured evergreen facilities were a predictor of a "run-on-the-bank." However, during 2007 availability of longer-term secured funding including evergreen facilities was declining for most investment banks, so that by March, an increasing amount of secured funding was provided on a short-term basis. This was phenomenon visible at many firms and was well understood at the time by TM staff.
- The OIG Report's statement that OIG staff could not determine whether TM staff received information on secured lending facilities, including evergreen is unsupported. As we explained in informal comments to OIG, since at least August 2007 TM staff periodically received information on the availability of secured evergreen facilities in Fixed Income Inventory Analysis reports compiled by Bear Stearns. Also, TM staff explained that in weekly and daily discussions with Bear's fixed income funding desk and with the Treasury managers, Bear informed TM staff of significant losses of such evergreen facilities.

### **Recommendation 3:**

The Division of Trading and Markets should ensure that it adequately incorporates a firm's concentration of securities into the Consolidated Supervised Entity (CSE) program's assessment of a firm's risk management systems (e.g., internal controls, models, etc.) and more aggressively prompt CSE firms to take appropriate actions to mitigate such risks.

### **Management Response (Concur or Non-concur):**

We concur with the recommendation, and either already had in place processes, or have since undertaken efforts that respond to the recommendation.

- The CSE program incorporates an assessment of a firm's concentration of securities into the firm's risk management processes and systems.

## APPENDIX VII CONTINUED..

- TM staff have in the past instructed CSEs to reduce outsized, or concentrated exposures related to lending to specific sovereigns, particular instruments or risk factors.

However, the recommendation misapprehends the role of the Commission in overseeing CSEs.

- The OIG Report's conclusion at base is an indictment not of the CSE program's assessment of risk management systems, but of Bear's fundamental business strategy.
- At the time of Bear's CSE approval and thereafter, it was apparent to the Commission and CSE staff, as well as to Bear's equity and debt investors and the market, that Bear Stearns business strategy was focused on US-based fixed income generally and mortgages in particular.
- It is worth noting that a number of other institutions supervised under a variety of regulatory regimes, including Indy Mac, Countrywide and Northern Rock, likewise collapsed because of a business model that relied heavily on mortgage origination or securitization. Moreover, as announced by the US Treasury Department on September 7, 2008, the US Government has placed Fannie Mae and Freddie Mac in conservatorship as a result of the losses they suffered on their mortgage-based holdings.
- The Commission's responsibility was not to dictate business strategies to Bear Stearns. Rather, it was to review whether the exposures taken on by Bear Stearns were properly controlled and measured. The focus of Commission staff on Bear's governance processes was intended to insure that these exposures were reported to senior management in a manner that accurately reflected material risks.
- To discharge this responsibility, Commission staff monitored the risk profile of the firm in the aggregate and at the desk level using a variety of metrics, and discussed with the firm's independent risk management instances where limits were exceeded. These exposures were reported both to Bear's senior business Heads as well as to the Executive Committee regularly.

### **Recommendation 4:**

The Division of Trading and Markets, in consultation with the Board of Governors of the Federal Reserve System, should reassess the Consolidated Supervised Entity (CSE) program's policy regarding leverage ratio limits and make a determination as to whether, and under what circumstances, to impose leverage ratio limits on the CSEs.

## APPENDIX VII CONTINUED..

### Management Response (Concur or Non-concur):

Given the current public discussions about the utility of leverage ratios for securities firms, we concur with the recommendation and believe it is important to address this issue with fellow regulators. The Recommendation, however, minimizes the problems with imposing limits through leverage ratios.

- Financial institutions are, by their very nature, highly leveraged businesses.
- The Commission has not sought to impose explicit leverage limits on CSE holding companies for several reasons. First, analysts can easily assess leverage from public financial information. Second, a leverage ratio is a crude measure, and implicitly assumes that every dollar of balance sheet involves the same risk, whether due to a treasury bond or an emerging market equity. Further, leverage tests do not at all capture the potential exposures of derivative products that remain off balance sheet. Finally, a leverage limit creates an incentive for firms to move exposures off balance sheet, through instruments ranging from over-the-counter derivatives to the SIV structures that proved highly problematic for other financial institutions (not investment banks) in the last year.
- While a leverage limit may be effective for an institution that does not deal in derivative products, highly complex institutions can easily evade any leverage limit imposed, often with the unintended consequence of increasing the firm's exposure to complex instruments.

### Recommendation 5:

The Division of Trading and Markets (TM) should ensure that: (1) the Consolidated Supervised Entity (CSE) firms have specific criteria for reviewing and approving models used for pricing and risk management, (2) the review and approval process conducted by the CSE firms is performed in an independent manner by the CSEs' risk management staff, (3) each CSE firms' model review and approval process takes place in a thorough and timely manner, and (4) impose limits on risk taking by firms in areas where TM determines that risk management is not adequate.

### Management Response (Concur or Non-concur):

TM concurs with the goals of recommendation 5, and the CSE program does ensure that these standards are satisfied.

- However, the OIG Report does not recognize the progress achieved through the review process. While the OIG Report correctly notes that the staff raised concerns with Bear Stearns regarding its coverage and staffing of its Model Review Function, the OIG Report does not reflect the resulting subsequent progress. In fact, the firm did respond to staff concerns, and created and implemented action plans to address them.

## APPENDIX VII CONTINUED..

- For example, in September 2006 Bear hired two dedicated model control staff persons for MBS and cash products and three completed model reviews were presented at this time. The MBS and Cash inventory models were reviewed between September 2006 and December 2007.
- With respect to the risk metrics that the firm used in managing its market risk to mortgage products, the OIG Report contains key omissions, and incorrect conclusions.
- The firm in fact made significant progress in improving its VaR infrastructure subsequent to approval in response to Commission staff concerns. For example, the firm followed through on recommendations to enhance control over the VaR system. Inputs to VaR models were regularly updated following application approval.
- Since the beginning of the SEC oversight of Bear as a CSE, Bear regularly improved and expanded its data sources. In some instances where data sources were limited, the instruments were immaterial. For example, mortgage derivatives, which were distinct from CDS and ABS CDO positions, were an immaterial exposure with only de minimis impact on Bear's profit and loss.
- The OIG report assumptions and conclusion regarding Bear's model review staffing are inaccurate. Specifically, while certain model reviewers left Bear in 2006 and the head of model validation resigned in early 2007, TM staff discussed staffing and the model validation process with the head of Bear's Model Review Committee. The model control function for mortgages was shifted to the product line risk managers while a new Head of Model Validation was hired in Sept 2007. Model control work on mortgages was unaffected during the interim period.

### **Recommendation 6:**

The Division of Trading and Markets should be more skeptical of Consolidated Supervised Entity firms risk models and work with regulated firms to help them develop additional stress scenarios that may or may not have not have been contemplated as part of the prudential regulation process.

### **Management Response (Concur or Non-concur):**

TM concurs that skepticism is warranted when reviewing firm risk models, but we believe that Recommendation 6 is based on incomplete information.

- Bear Stearns' use of scenario analysis was consistent with industry practices: virtually the entire banking sector failed to anticipate the magnitude and scope of the housing decline that is still ongoing.
- TM staff did in fact discuss repeatedly with Bear risk officers the firm's Alt-A and option ARMS positions in addition to subprime.



## APPENDIX VII CONTINUED..

- Therefore, the OIG report conclusions, which are based on the OIG expert's review of internal TM memoranda that did not mention forward-looking risk scenarios, such as a complete meltdown of mortgage market liquidity, are based on incomplete information.

### **Recommendation 7:**

The Division of Trading and Markets (TM) should be involved in formulating action plans for a variety of stress or disaster scenarios, even if the plans are informal, including plans for every stress scenario that the Consolidated Supervised Entity (CSE) firms use in risk management, as well as plans for scenarios that TM believes might happen but are not incorporated into CSE firms' risk management.

### **Management Response (Concur or Non-concur):**

We concur with the recommendation, but believe that it reflects what TM and Bear had already accomplished.

- Contrary to the OIG Report statements, Bear did incorporate into its risk scenarios those risks discussed in meetings with TM staff, such as a housing-led recession scenario.

### **Recommendation 8:**

The Division of Trading and Markets should take steps to ensure that mark disputes do not provide an occasion for Consolidated Supervised Entity firms to inflate the combined capital of two firms by using inconsistent marks.

### **Management Response (Concur or Non-concur):**

We concur with the recommendation as written, but we believe it reflects a misunderstanding of the marking process and the oversight capabilities of supervisors.

### **TM did inquire into the mark disputes referenced in the OIG Report.**

- TM acknowledges certain, persistent mark disputes indicate illiquid assets and valuation issues that TM should inquire into. However, mediating most or all of any individual firm's disagreements over marks across all its counterparties is not feasible. Additionally, many of the disputed margin calls related to products such as customized structured credit derivatives where price transparency is an issue and variations in marks is conceivable.
- The OIG report does not provide the proper context when discussing certain \$100 million mark disputes Bear had with counterparties. Bear had more than 25,000 trades with JPM and, given the nature of the counterparty, a highly-rated financial institution, the capital impact under Basel II would be de minimis.

## APPENDIX VII CONTINUED..

- Therefore, TM believes that the OIG report assumption that firms are collaborating to create capital was not properly substantiated.
- The OIG report confounds marking versus price verification processes at investment banks, and does not consider all the information provided to OIG by TM regarding price verification processes.

### Background on Industry Practice:

First, we should point out that margin disputes are unavoidable particularly when markets become less liquid or illiquid. This is an issue that all dealers are facing today and the total disputed numbers at Bear Stearns were much smaller than at other institutions.

With respect to the OIG report assertion about using traders' marks for profit and loss, it is universal industry practice (and endorsed by various descriptions of best practices such as the Group of 30) for traders to mark firm inventory for purposes of books and records. It is then that an independent control group has the role of validating or substantiating those marks via an independent price verification process.

### **Recommendation 9:**

The Division of Trading and Markets should encourage the Consolidated Supervised Entity (CSE) firms to present VaR and other risk management data in a useful manner, which is consistent with how the CSE firms use the information internally and which allows risk factors to be applied consistently to individual desks.

### **Management Response (Concur or Non-concur):**

TM concurs with the recommendation, but we believe the findings are inaccurate.

- Contrary to the OIG Report assertion, Bear did not use inconsistent VaR numbers:
- The OIG expert supports this conclusion by noting that Bear's trading desks evaluated profits and risks individually and so assumes VaR was not implemented firmwide.
- As TM already explained in informal comments, Bear's trading desks and businesses used a variety of metrics to measure and manage its risk. VAR, however, was implemented firm-wide.

## APPENDIX VII CONTINUED..

### **Recommendation 10:**

The Division of Trading and Markets should ensure that the Consolidated Supervised Entity take appropriate valuation deductions for illiquid, hard-to-value assets and appropriate capital deductions for stressed repos, especially stressed repos where illiquid securities are posted as collateral.

### **Management Response (Concur or Non-concur):**

TM concurs with the recommendation and either already had in place processes, or have since undertaken efforts that respond to the recommendation. However, we believe the findings underlying Recommendation 10 are unsupported.

The report asserts TM should have considered expanding the list of assets that require a full deduction from capital. However, the Report did not present evidence that TM did not follow Basel II or did not apply sufficiently conservative capital treatment in light of the relative illiquidity of assets. The analysis to support this assertion is incomplete or without basis.

As explained in informal comments to the OIG, TM applied Basel II correctly and did employ conservative capital treatment where appropriate.

- Specifically, with respect to illiquid assets, Basel II does not require full deduction of most illiquid assets, many of which attract capital charges of 8%. TM did require full deduction for certain illiquid assets, such as mortgage residuals.
- For assets held in the trading book, Bear took significant mark-downs in mortgage-related assets which resulted in a reduction of Tier 1 capital, as it should.
- With respect to the report's description of Bear's loan to the BSAM High Grade hedge fund, as TM explained in informal comments, the loan was overcollateralized, and Basel II did not require Bear to reduce its capital by the full amount of the loan.
- Specifically, TM explained to the OIG that Bear provided the replacement secured funding to BSAM funds at current marks, that is net of write-downs, and with haircuts. Bear took capital charges for the resulting secured exposures that far exceeded Basel II requirements, and effectively treated the positions as if these had been held on Bear Stearns' balance sheet.
- When the BSAM funds failed to make margin calls in July, the assets were indeed taken onto Bear Stearns' books.

## APPENDIX VII CONTINUED..

### **Recommendation 11:**

The Division of Trading and Markets (TM), in consultation with the Chairman's Office, should discuss risk tolerance with the Board of Directors and senior management of each Consolidated Supervised Entity (CSE) firm to better understand whether the actions of CSE firm staff are consistent with the desires of the Board of Directors and senior management. This information would enable TM to better assess the effectiveness of the firms' risk management systems.

### **Management Response (Concur or Non-concur):**

TM concurs with this recommendation and we have already had in place processes, or have since undertaken efforts, that respond to the recommendation.

- TM acknowledges that SEC senior officials should engage the CSE boards of directors periodically to review risk management issues and assess risk tolerance or discuss particular issues.

### **Recommendation 12:**

The Division of Trading and Markets should require compliance with the existing rule that requires external auditors to review the Consolidated Supervised Entity firms' risk management control systems or seek Commission approval in accordance with the Administrative Procedures Act<sup>1</sup> for this deviation from the current rule's requirement.

### **Management Response (Concur or Non-concur):**

TM understands the recommendation and will present to the Commission whether to require compliance with the existing rule or to propose rule amendments that would permit the internal auditor to perform this review.

However, we believe that the finding is incorrect. We raised the following issues with respect to this finding and recommendation:

- TM has specific authority to issue exemptions from the net capital rule of which 15c3-1g is an appendix. See 17 CFR 200.30-3(a)(7)(ii). The functions of the Director of Trading and Markets include responding to no-action requests from CSEs. See 17 CFR 200.19a.
- TM strongly disagrees with the statement that there are serious questions about the wisdom of its decision. The Rule permits the external audit to be based on

<sup>1</sup> The Administrative Procedures Act (5 U.S.C. §500 *et seq.*) sets forth the basic procedural requirements for agency rulemaking. It generally requires (1) publication of a notice of proposed rulemaking in the *Federal Register*, (2) opportunity for public participation in rulemaking by submission of written comments, and (3) publication of a final rule and accompanying statement of basis and purpose not less than 30 days before the rule's effective date.

## APPENDIX VII CONTINUED..

“agreed upon procedures” between the firm and its external auditor. After much negotiation between the Division of Trading and Markets, the CSEs and the external auditors, the external auditors would not agree to perform more than a “check the box” review of the risk management control systems for fear of liability. Thus, it was apparent that the “agreed upon procedures” would be of minimal benefit.

- In contrast, TM believed that a substantive review of procedures by internal audit, which included a determination of whether the procedures used by the firm were sufficient for the purposes intended, would be a more effective check on the firms’ risk management process. As a result, the internal audits undertaken by the firm were greater in scope and substance than would have been performed by the external auditors under their agreed upon procedures. The internal audit department’s review of internal risk management controls also would be conducted throughout the year rather than as a once a year audit process. The independence, staffing levels, and audit scopes of the internal audit departments were reviewed by OCIE and the Division of Trading and Markets as part of the application process.
- The report’s statement that “the external auditor’s work is more strictly regulated as the PCAOB regulates external auditors” is misleading due to the lack of substantive auditing standards for reviewing a firm’s risk management control systems. It also is not clear that the PCAOB has in place a process for reviewing such auditing work.

### **Recommendation 13:**

The Division of Trading and Markets should ensure that reviews of a firm’s Contingency Funding Plan include an assessment of a Consolidated Supervised Entity firm’s internal and external communication strategies.

### **Management Response (Concur or Non-concur):**

The Division of Trading and Markets does not concur with this recommendation.

- As TM informed OIG in earlier comments, there is no requirement in the CSE rules that CSEs have an internal or external communication policy. Likewise, there are no SEC rules requiring non-CSE broker-dealers to maintain such communication policies, and we are unaware of any such requirement for any other SEC regulated entities. Although TM noted that Bear Stearns had a communications strategy within its Contingency Funding Plan, there was no TM “assessment” of that strategy, as stated by OIG.
- What OIG has failed to appreciate is that the CSEs are part of public holding companies that have securities registered with the SEC and listed and trading on U.S. securities exchanges. As public companies, the CSEs are subject to myriad

## APPENDIX VII CONTINUED..

SEC disclosure requirements, including Regulation S-X and Regulation FD. Corporate disclosures such as those covered in Bear Stearns's CFP communication strategy are subject to those disclosure requirements, and the SEC's Divisions of Corporation Finance and Enforcement actively enforce compliance with these requirements. Accordingly, it would be inappropriate for TM to opine on, or otherwise influence, the corporate communications of these public companies.

### **Recommendation 14:**

The Division of Trading and Markets should develop a formal automated process to track material issues identified by the monitoring staff to ensure that they are adequately resolved. At a minimum, the tracking system should provide the following information:

- The source of the issue;
- When the issue was identified;
- Who identified the issue;
- The current status of the issue (e.g., new developments);
- When the issue was resolved; and
- How the issue was resolved.

### **Management Response (Concur or Non-concur):**

TM concurs with the recommendation, and will undertake efforts that fully respond.

However, the analysis underlying the recommendation does not show evidence that the CSE program failed to adequately resolve issues, or that material issues were not monitored.

- Rather, the OIG report reaches its conclusion that the program does not adequately track issues from its criticism of the recordkeeping of those issues. While we recognize that an automated audit trail is desirable, its absence is not proof that issues are not adequately tracked, merely that recording of those issues could be improved.

### **Recommendation 15:**

The Division of Trading and Markets should: (1) reassess all the prior Office of Compliance Inspections and Examinations (OCIE) issues to ensure that no significant issues are unresolved (given the belief that OCIE followed up); and (2) follow up on all significant issues.

## APPENDIX VII CONTINUED..

### Management Response (Concur or Non-concur):

We understand the recommendation, but believe that these issues are either moot or long since addressed.

- Moreover, as we explained in our informal comments, the recommendation is predicated on an incorrect understanding of the division of responsibilities, past and present, between the Division of Trading and Markets and OCIE. The report criticizes TM staff that "assumed" issues were the responsibility of OCIE, whereas in fact for eighteen months subsequent to the Bear Stearns application examination, the issues were in fact OCIE's responsibilities.
- In addition, as we informed OIG in our informal comments, TM monitored the material issues to assure that they were resolved. TM and OCIE agreed that one issue mentioned in the report, the issue regarding workpaper retention at Bear Stearns, was material. The firm was required to respond in writing to TM before a recommendation was made that the Commission act upon the application, and firm in fact agreed to retain workpapers. Subsequent oversight by TM personnel relied on access to these workpapers and so verified that corrective action had in fact occurred. With regard to the second issue mentioned in the report, as we explained in our informal comments, there is no basis for the statement about materiality of the VaR model issue. The OIG expert did not directly review the models, related documents, and the firm's books and records. Without a thorough review and reasonable basis for the statement, its materiality finding is conclusory. Appendix III indicates clearly that neither OIG nor the expert conducted an independent analysis of Bear's risk management system.

### Recommendation 16:

The Division of Trading and Markets should ensure that they complete all phases of a firm's inspection process before recommending that the Securities and Exchange Commission allow any additional Consolidated Supervised Entity firms the authority to use the alternative capital method.

### Management Response (Concur or Non-concur):

The Division of Trading and Markets does not concur with this recommendation.

- As the Division staff explained in informal comments, the Commission was clearly informed of the examination findings and their status when they approved the CSE applications.

## APPENDIX VII CONTINUED..

- In addition, the OIG report's characterization of the application process as "less meaningful" is inaccurate. The Commission was well within its authority to approve such applications, given they were notified of OCIE's findings, of TM's assessment of the materiality of the issues with respect to the application, and of TM's direct follow up with Bear Stearns (or other CSE) regarding the identified issues and resolution.
- The OIG report fails to appreciate that CSE examinations were an ongoing process. As part of its normal business operations, a CSE constantly reviewed its risk management systems to assure that those systems adequately dealt with marketplace changes. Consequently, the staff continually monitored a firm's risk management systems to identify changes a CSE made to its risk management systems and to determine whether those changes appropriately addressed the perceived issues and that they were adequately implemented. For instance, if marketplace changes caused an increase in a CSE's backtesting exceptions, the CSE could amend its models to capture additional data points in an effort to decrease such exceptions. In such cases the staff would review and approve those changes to the CSE's models.
- With respect to Bear in particular, the European Commission's Conglomerates Directive set a fixed deadline by which the firm needed to be supervised on a consolidated basis. Given this timeline and the level of materiality of the issues involved, TM did not believe it necessary to wait for the formal transmittal of a written deficiency letter or the receipt of a written response before recommending the Commission approve the order.
- Finally, the OIG report's statement that TM failed to follow up on issues raised by OCIE during its inspection of Bear is incorrect. As explained to OIG staff in TM's informal comments, TM indeed resolved material issues identified by OCIE and the report has not cited any factual basis for finding otherwise.

### **Recommendation 17:**

The Divisions of Corporation Finance (CF) and Trading and Markets (TM) should take concrete steps to improve their collaboration efforts and should determine whether TM's information on the Consolidated Supervised Entity (CSE) firms could be used by CF in its review of the CSE firms.

### **Management Response (Concur or Non-concur):**

TM concurs with this recommendation, and will work with CF to assess the degree to which additional information and information would be useful.

- However, as the staff explained in its informal comments, TM staff met repeatedly with CF staff during 2007 and 2008 to discuss the issues cited in the



## APPENDIX VII CONTINUED..

report around public disclosure of capital information. No acknowledgement of these efforts is made in the formal draft report.

### **Recommendation 18:**

The Division of Trading and Markets (TM) and the Office of Compliance Inspections and Examinations (OCIE) should develop a collaboration agreement (*e.g.*, discussing information sharing) that maintains a clear delineation of responsibilities between TM and OCIE with respect to the Consolidated Supervised Entity program. They should inform the Chairman's Office of any disagreement(s) so that the issue(s) can be resolved.

### **Management Response (Concur or Non-concur):**

TM concurs with this recommendation, and will work with OCIE and the Chairman's office to determine how collaboration should be further formalized.

- As we informed OIT in our informal comments, however, and what is not described in the OIG report, is that TM and OCIE issued joint guidance to all staff regarding the division of responsibilities and the sharing of information with respect to the CSE firms on March 19, 2007, shortly after the Commission transferred inspections responsibility from OCIE to TM. TM has complied with all provisions of that guidance.

### **Recommendation 19:**

The Division of Trading and Markets and the Office of Risk Assessment should develop an agreement outlining their roles and responsibilities, as well as methods for information sharing such as communicating project results. These two offices should inform the Chairman's Office of any disagreement(s) so that the issue(s) can be resolved.

### **Management Response (Concur or Non-concur):**

TM concurs with this recommendation, and will work with ORA and the Chairman's office to determine how collaboration should be further formalized.

- We note, however, that TM's relationship with ORA is strong, as evidenced by collaboration on a number of issues ranging from credit rating agencies to analysis of Bear Stearns' failure.
- Formalizing an agreement between two offices within the Commission would be relatively unusual, in contrast to concluding a formal MOU with an external agency such as the Federal Reserve.

## APPENDIX VII CONTINUED..

### **Recommendation 20:**

The Division of Corporation Finance should: (1) develop internal guidelines for reviewing filings in a timely manner, and (2) track and monitor compliance with these internal guidelines.

### **Management Response (Concur or Non-concur):**

Please see CF letter submitted separately.

### **Recommendation 21:**

The Division of Corporation Finance (CF) should (1) establish a policy outlining when firms are expected to substantively respond to issues raised in CF's comment letters, and (2) track and monitor compliance with this policy.

### **Management Response (Concur or Non-concur):**

Please see CF letter submitted separately.

### **Recommendation 22:**

Chairman Cox should create a task force led by the Office of Risk Assessment (ORA) with staff from the Divisions of Trading and Markets, and Investment Management, and the Office of Compliance Inspections and Examinations. The Task Force should perform an analysis of large firms with customer accounts that hold significant amounts of customer funds and have unregulated entities, to determine the costs and benefits of supervising these firms on a consolidated basis. If the Task Force ultimately believes that the Securities and Exchange Commission (Commission) should supervise these firms on a consolidated basis, it should make a recommendation to the Commission that involves seeking the necessary statutory authority to oversee these firms on a consolidated basis.

### **Management Response (Concur or Non-concur):**

TM concurs with this recommendation.

- We note, however, that this issue was previously considered when implementing the rules for Supervised Investment Bank Holding Companies (SIBHCs).
- In Exchange Act Release 49831, the Commission found that its supervision of an investment bank holding company as a SIBHC would be necessary and appropriate only when the IBHC is affiliated with a broker-dealer that has a "substantial presence" in the securities business. The requirement that a firm have a "substantial presence" was to identify broker-dealers and their holding companies whose failure could have a materially adverse impact on other securities market participants, thus reducing systemic risk.
- Under the SIBHC rules, among other things, evidence that an investment bank holding company owns or controls a broker-dealer that maintains \$100 million in

## APPENDIX VII CONTINUED..

tentative net capital would be sufficient to demonstrate a substantial presence in the securities business. One firm has applied to be supervised as a SIBHC.

### **Recommendation 23:**

The Division of Trading and Markets, in consultation with the Chairman's office, should determine what additional changes need to be made to the Consolidated Supervised Entity (CSE) program in light of the collapse of Bear Stearns and changing economic environment.

### **Management Response (Concur or Non-concur):**

We understand the recommendation, and are now actively working with the Chairman's Office to consider what changes are appropriate in light of recent developments. In addition, the Chairman has made a number of requests for legislative changes that could require further modifications of the CSE program.

### **Recommendation 24:**

The Division of Trading and Markets (TM) should fill critical existing positions, and consider what any additional staff it believes will be needed to carry out the CSE program's function going forward. TM should also establish milestones for completing each phase of an inspection and implement a procedure to ensure that the milestones are met.

### **Management Response (Concur or Non-concur):**

TM concurs with this recommendation, and we have already undertaken efforts that fully respond to it.

- We have posted a position for an Assistant Director (CSE Inspections) in New York, as well as staff jobs for the CSE inspections units in both New York and Washington.
- It is worth noting, however, that this recommendation arises in part from a misperception of the CSE inspections program.
- As we informed the OIG in our informal comments, three inspections have been conducted and two inspection reports have progressed to the final stages of review in the 13 months since responsibility was transferred from OCIE and in the 9 months since TM's inspections unit became operational.
- In addition, OIG staff was provided with a term sheet document, shared with the Commission in Fall 2007, which set out the specific milestones used to assess progress in each inspections project. While the TM staff would certainly prefer that all three inspections were fully complete at this point, the unprecedented

## APPENDIX VII CONTINUED..

financial market conditions that have prevailed through much of this year have affected the pace of this work, and much else.

### **Recommendation 25:**

The Division of Trading and Markets, in consultation with the Office of Compliance Inspections and Examinations and the Commission's Ethics office, should develop an ethics manual.

### **Management Response (Concur or Non-concur):**

TM concurs with this recommendation, and we have already undertaken efforts that fully respond to the recommendation.

- As we informed the OIG in our informal comments, the finding is based upon flawed understanding of the current situation. In particular, on March 1, 2005, the Division Director of TM directed the Division staff to follow OCIE's Ethics Guidelines with two minor variations.
- For simplicity's sake, TM management recently concluded that staff should follow the OCIE guidelines. An email has been sent to the staff providing that clarification.

### **Recommendation 26:**

The Division of Trading and Markets should continue to seek out ways to increase its communication, coordination, and information sharing with the Federal Reserve and other Federal Regulators.

### **Management Response (Concur or Non-concur):**

TM concurs with the recommendation, and we have already undertaken efforts that fully respond to the recommendation. Since inception, TM has collaborated with a large number of other regulators in the context of the CSE program, including the Federal Reserve Board, the New York Federal Reserve Bank, the FDIC, the State of Utah, and others. Efforts continue to expand the range of both bilateral and multilateral activities.

## MEMORANDUM

**TO:** David Kotz  
Jill Lennox  
Office of Inspector General

**FROM:** Lori Richards, Director  
Office of Compliance Inspections and Examinations

**SUBJECT:** OIG Draft Report 446 -A: "*SEC's Oversight of Bear Stearns and Related Entities: The Consolidated Supervised Entity Program*"

**DATE:** September 24, 2008

The Office of Inspector General provided a draft of its report, OIG Report 446 -A "*SEC's Oversight of Bear Stearns and Related Entities: The Consolidated Supervised Entity Program*" and has requested that we provide a written response indicating whether or not we concur with each recommendation that refers to the Office of Compliance Inspections and Examinations. This memo outlines our response.

There are three recommendations in the Report that are directed to the Office of Compliance Inspections and Examinations (OCIE) (Recommendations 18, 22, and 25), and one recommendation that references the Office (Recommendation 15). Our response to each is discussed below.

**Recommendation 18:**

The Division of Trading and Markets (TM) and the Office of Compliance Inspections and Examinations (OCIE) should develop a collaboration agreement (*e.g.*, discussing information sharing) that maintains a clear delineation of responsibilities between TM and OCIE with respect to the Consolidated Supervised Entity program. They should inform the Chairman's Office of any disagreement(s) so that the issue(s) can be resolved.

OCIE concurs with Recommendation 18. We believe that a collaboration agreement that maintains a clear delineation of responsibilities between TM and OCIE with respect to the Consolidated Supervised Entity (CSE) program would improve the effectiveness of the oversight by both offices. While the two offices issued a memorandum on March 19, 2007 to all staff involved in CSE oversight that described the allocation of responsibilities and the reallocation of CSE examination oversight from OCIE to TM, a more detailed agreement could enhance the information sharing and corroboration between the two offices.

**Recommendation 22:**

## APPENDIX VII CONTINUED..

Chairman Cox should create a task force led by the Office of Risk Assessment (ORA) with staff from the Divisions of Trading and Markets, and Investment Management, and the Office of Compliance Inspections and Examinations. The Task Force should perform an analysis of large firms with customer accounts that hold significant amounts of customer funds and have unregulated entities, to determine the costs and benefits of supervising these firms on a consolidated basis. If the Task Force ultimately believes that the Securities and Exchange Commission (Commission) should supervise these firms on a consolidated basis, it should make a recommendation to the Commission that involves seeking the necessary statutory authority to oversee these firms on a consolidated basis.

OCIE concurs with Recommendation 22. A joint TM, OCIE and IM task force led by the Office of Risk Assessment to determine the costs and benefits of supervising firms with significant customer assets and unregulated affiliates could be very valuable in producing evidence supporting the need for consolidated oversight. At the current time, the SEC is generally limited in its oversight authority of financial firms to registered broker-dealers, investment advisers, and transfer agents; the Consolidated Supervised Entity oversight is a voluntary program. In the current environment, where firms are highly diversified and deal in very complex products and businesses, with much of this activity in unregulated material affiliates, consideration of additional statutory authority would be valuable.

### **Recommendation 25:**

The Division of Trading and Markets, in consultation with the Office of Compliance Inspections and Examinations and the Commission's Ethics office, should develop an ethics manual.

OCIE concurs with Recommendation 25. OCIE has implemented strong written ethics procedures for the OCIE examination force, with requirements and prohibitions that are more stringent than the SEC procedures that apply to all SEC staff. Examiners are entrusted with special responsibilities that require the utmost integrity, avoidance of even a remote appearance of a conflict of interest, and the highest level of professional conduct. Because SEC exam staff are evaluating compliance with the law and effectiveness of risk management controls, their credibility, judgment, and independence must be above reproach. For this reason, OCIE believes that the stringent ethics procedures that apply to OCIE examination staff should apply consistently to all SEC staff that perform examinations, and would work with TM to develop an ethics manual for the CSE program.

While Recommendation 15 does not require any action by OCIE, it does reference the Office and therefore we add the comment below.

### **Recommendation 15:**

The Division of Trading and Markets should: (1) reassess all the prior Office of Compliance Inspections and Examinations (OCIE) issues to

## APPENDIX VII CONTINUED..

ensure that no significant issues are unresolved (given the belief that OCIE followed up); and (2) follow up on all significant issues.

We note that the OCIE examination process generally involves requesting and receiving documents, reviewing and evaluating those documents and conducting an onsite review, determining if any deficiencies or weaknesses exist, conducting an exit interview with the firm, producing an examination report and detailing deficiencies in a deficiency letter sent to the firm examined. The OCIE staff request that the firm provide a detailed written response to the deficiency letter that describes any corrective action. OCIE evaluates the response and determines whether the firm has responded appropriately. For significant findings that do not appear to be appropriately resolved, OCIE works with the firm on resolution. All responses to findings that required action by the firm are then followed up in the next examination. The most recent CSE examination of Bear Stearns that was conducted by OCIE resulted in an examination report issued by OCIE in December 2005, and Bear Stearns provided its response in January 2006. The results were provided to TM. TM subsequently assumed responsibility for the overall CSE examination program in March 2007, and OCIE ceased CSE examination activities as of that date (OCIE examiners continue to be solely responsible for examinations of broker-dealer firms that are part of CSEs).

\*\*\*

As an additional matter, on page 37 of the report you indicate that in 2007 the Government Accountability Office commented on our method of tracking recommendations regarding Self-Regulatory Organization ("SRO") inspections. Please note that following receipt of that comment, OCIE developed a formal tracking system for recommendations in SRO inspections, and deployed the system for use in SRO inspections in early 2008.

Finally, you requested that OCIE indicate whether there is non-public OCIE information in the report. Any non-general examination-related information would be considered non-public. Examples of this are found on pages 20, 37, and 39 of the report.

APPENDIX VII CONTINUED..



UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549

September 24, 2008

H. David Kotz  
Inspector General  
U.S. Securities and Exchange Commission  
100 F Street, NE  
Washington, DC 20549

Dear Mr. Kotz:

Thank you for the opportunity to respond to the recommendations relating to the Division of Corporation Finance in your August 18, 2008 draft report *SEC's Oversight of Bear Stearns and Related Entities: The Consolidated Supervised Entity Program* (Audit Report No. 446-A).

In 2007, Corporation Finance selected Bear Stearns' 2006 Form 10-K for review. On September 27, 2007, two months prior to its internal guideline for issuance of a comment letter to a company selected for review, Corporation Finance issued its comment letter to Bear Stearns. That letter included a focus on subprime mortgage matters. Soon after receiving this letter, and well before Bear Stearns' collapse in March 2008, Bear Stearns began adding improvements to its disclosures about subprime mortgage securities in its publicly available filings. Those additional disclosures appear in:

- Its Form 10-Q filed on October 10, 2007 (details on net inventory markdowns related to losses in residential mortgages and leveraged finance areas);
- Its Form 8-K filed on November 15, 2007 (updated information on collateralized debt obligations and subprime related exposures);
- Its Form 8-K filed on December 21, 2007 (fourth quarter financial results, including a detailed exhibit of CDO and subprime mortgage asset exposures); and
- Its Form 10-K filed on January 29, 2008 (schedule of subprime exposure).



## APPENDIX VII CONTINUED..

H. David Kotz  
Inspector General  
U.S. Securities and Exchange Commission  
Page 2

### **Division of Corporation Finance concerns about Audit Report findings on Bear Stearns filing review**

In Finding 8 of your audit report, you recommend what could be sweeping changes to Corporation Finance's full disclosure program based upon conclusions you draw from a *single* Corporation Finance review – the review of Bear Stearns' 2006 Form 10-K. You include conclusions regarding that review in Finding 8 with which I cannot agree, the two most significant of which are:

1. That Corporation Finance's "untimely review deprived investors of material information that they could have used to make well-informed investment decisions," and
2. That Corporation Finance's review of Bear Stearns was "untimely."

#### ***The Division of Corporation Finance review of Bear Stearns resulted in improved and timely disclosure for investors***

As to the first of these conclusions, you indicate that "Bear Stearns' response letter (coupled with CF's comment letter) contained material information that investors could have used to make well-informed investment decisions." You also conclude that "the information (e.g., Bear Stearns' exposure to subprime mortgage securities) could have potentially been beneficial to dispel rumors that led to Bear Stearns' collapse." While you go on to identify information in that letter and state that Albert S. Kyle, the OIG expert, believes that this information would have been "helpful" to investors, you do not note the significant redactions of information. I do not understand the basis for your or Professor Kyle's conclusions.

First, as I indicate above, Bear Stearns began making additional public disclosures concerning its subprime exposures in its public filings soon after it received our September 27, 2007 comment letter. In addition, the information that was in Bear Stearns' response to our comment letter, which we later posted on our website, was heavily redacted under the confidentiality provisions of Rule 83. I note that in well over 100 places in the letter, Bear Stearns redacted significant information.<sup>1</sup> I have difficulty agreeing with Professor Kyle that this heavily redacted letter, which would not have

<sup>1</sup> Redacted information included: various metrics utilized to determine FICO scores and designation of loans as subprime; loan to value ratios; subprime production in 2005 and 2006; trend data for loan-to-value ratios and full-document loans during 2007; percentage of loans with full documentation; size of data sample upon which risk models are based; table of margin requirements by collateral type; fair value of subprime loans at various dates; fair value and balance of non-performing subprime loans; fair value of retained interests in subprime securitizations; reduction of subprime exposure from hedging; fair value of securitization trusts; amount of subprime loans serviced; amounts securitized through SPEs; amounts provided to finance subprime collateral to counterparties; fair value of other subprime related instruments; revenues derived from subprime activity for all periods presented; litigation reserves.

H. David Kotz  
 Inspector General  
 U.S. Securities and Exchange Commission  
 Page 3

become available under our posting policy until at least 45 days after we completed our review and after Bear Stearns had made additional subprime disclosures (which included actual numeric data and dollar amounts), would have been “helpful” to investors or would have provided material information that Bear Stearns had not already provided in the public reports it filed with us. The redacted letter, however, is publicly available and I urge investors and other readers of this report to review the Bear Stearns response letter, and reach their own conclusions about the importance of the additional information appearing in the redacted letter, particularly in light of public disclosures in the Forms 8-K, 10-Q and 10-K I reference above.<sup>2</sup>

*The Division of Corporation Finance review was timely*

As to the second conclusion with which I cannot agree, you conclude that “CF’s filing review of Bear Stearns’ 2006 10-K was not timely.” This is not correct and the implication of your conclusion is that we should review Forms 10-K immediately upon filing and that a failure to do so means that we are “untimely.” As background, we have a selective review program, guided by Section 408 of the Sarbanes-Oxley Act of 2002, through which we review all public companies on a regular and systematic basis, at least once in a rolling three-year period. Following this statutory direction, we select for review between 35% and 40% of public companies each year – which results in approximately 4,000 to 4,500 company reviews. We do not have a requirement to review each company each year and there are many companies that we do not select for review in any given year. Although most Forms 10-K are filed in February and March, we conduct our reviews of those companies we select for review throughout the year.

As you correctly point out, our long standing internal guideline is that we should issue our initial comments to a company we select for review before the end of the company’s fiscal year. By following this guideline, we give the companies we select for review time to reflect our comments, if appropriate, in the disclosure in their next Form 10-K. As you state in your report, we met this internal guideline in our review of Bear Stearns’ 2006 Form 10-K, filed on February 13, 2007, by providing comments on September 27, 2007 – over two months *prior* to the end of Bear Stearns’ fiscal year on November 30, 2007. Thus, I cannot agree with your statement that the amount of time we spent to review Bear Stearns’ filing is “simply unacceptable.”<sup>3</sup>

<sup>2</sup> <http://www.sec.gov/Archives/edgar/data/777001/000091412108000089/filename1.txt>

<sup>3</sup> In fact, in 2006, the Inspector General (Audit 401) recommended that Corporation Finance consider ways to manage workload peaks resulting from the bunching of Form 10-K filings in February and March. This recommendation reflected the Inspector General’s acknowledgement of the difficulties we face in meeting our Sarbanes-Oxley mandated and internal review guidelines. The implication of this Inspector General recommendation in 2006 was actually that we should consider lengthening the timeframe for our filing reviews, not condensing it closer to the February and March filing peak.

## APPENDIX VII CONTINUED..

H. David Kotz  
Inspector General  
U.S. Securities and Exchange Commission  
Page 4

As an aside, I should point out that our comment letters to the other four CSE firms, all of which we selected for review in 2007, were sent out well before their fiscal year ends in November and December. We issued comments to Lehman Brothers Holdings Inc. on August 1, 2007; to Morgan Stanley on August 30, 2007; to Goldman Sachs Group, Inc. on September 20, 2007; to Merrill Lynch & Co., Inc. on September 25, 2007; and to Bear Stearns Companies, Inc. on September 27, 2007.

### *Current and periodic reports are the appropriate disclosure mechanism*

Separate from any discussion of these two conclusions, I thought it would be useful to provide some background on our review process and its role in prompting good public company disclosure. Our comment letters and company responses are not the mechanism for disclosure of material information to investors envisioned by our full disclosure program. The goal of disclosure of material information to investors, which is paramount in our efforts, is achieved in our program by seeking improvements to a company's public disclosures in its periodic and current reports. Those reports are readily available to all investors. These changes in disclosure are subject to the full liability provisions of the federal securities laws applicable to information appearing in these reports and, when they are included in a periodic report, the safeguards provided by the Sarbanes-Oxley Act of 2002 apply, including senior officer certifications and the disclosure controls and procedures process.

The public posting of comment letters and responses is only a recent development in our full disclosure program and is intended to increase the transparency of our review process and to make this correspondence available to all interested persons at no cost. We believe that companies like to look at the comment letters we send to their competitors to see what comments they might expect, as well as to glean competitive information. To address company concerns about public dissemination of competitively harmful information in their comment response letters, we permit companies to redact such information pursuant to a Rule 83 confidential treatment request. Companies frequently take advantage of this provision, as Bear Stearns did in its response letter in the review of its 2006 10-K.

We intentionally wait until at least 45 days after we complete a filing review before we post correspondence. Our separation of the exchange of views reflected in this correspondence from the disclosure public companies provide in their filings is intentional – we seek to promote a free give-and-take in the review process and to avoid having conclusions drawn from our questions before a company has an opportunity to respond. Frequently, a company's explanation or analysis of an issue will satisfactorily resolve an issue without any changes to previously filed or future disclosure. When a company improves its disclosure, it makes those improvements in its widely available periodic and current disclosure documents, which is where investors expect to find material disclosures. To my knowledge, investors do not use review correspondence, which may be heavily redacted, and which we do not post until 45 days after we

H. David Kotz  
 Inspector General  
 U.S. Securities and Exchange Commission  
 Page 5

complete our review, as a source of disclosure. To revamp our program to make this back-and-forth correspondence with a company a disclosure vehicle to investors would require significant, and I believe unwarranted, changes to our program, which would significantly undermine its effectiveness for investors.

*The Division of Corporation Finance seeks timely responses to its comments*

You also discuss Corporation Finance's general practice of requesting, but not requiring, that companies respond to comments within ten business days. While it is true that we rarely insist that a company respond in that timeframe, it is important to note that in many cases, companies do respond during that time period. You recommend that we establish a policy outlining when we expect companies to substantively respond to issues we raise in our comment letters and monitor compliance with this policy.

Our disclosure review program is built on the common goal we share with companies – to enhance disclosure and improve compliance with the disclosure requirements of the federal securities laws. Although the limited consequences of not responding to our comments can be quite significant – for example, a company is required to disclose material staff comments that have been outstanding for six months in its Form 10-K and/or Corporation Finance may refer a non-compliant company or one with faulty disclosure to the Division of Enforcement for further investigation – they are rarely the outcome of a staff filing review. While you recommend that we change our policy in this area, our experience is that most companies do respond to us, in some form, within the ten business days in which we seek a response. Our experience is also that, similar to the Bear Stearns review described above, a company may respond to staff comments in its public disclosure documents. Although we believe that extending the ten business day request-for-response time period will be counterproductive to our ongoing efforts to enhance public disclosure, we will consider your recommendation and how it would impact our program.

**Division of Corporation Finance's role with respect to the CSE program**

The Commission's CSE program is the focus of your report. You explain in the Executive Summary that your objectives in this audit "were to evaluate the Commission's CSE program, emphasizing the Commission's oversight of Bear Stearns, and to determine whether improvements are needed in the Commission's monitoring of CSE firms and its administration of the CSE program." You also summarize the work of Albert S. Kyle, the expert you obtained to assist you with your audit, and indicate that Professor Kyle's focus was on "the Division of Trading and Markets' oversight of the CSE firms, with a particular focus on Bear Stearns."

The Division of Corporation Finance is not directly involved with the CSE program and, as I understand your report, neither the Division of Corporation Finance, nor its full disclosure program generally, was the focus of your audit or of Professor

APPENDIX VII CONTINUED..

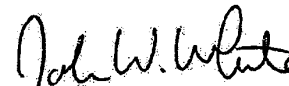
H. David Kotz  
Inspector General  
U.S. Securities and Exchange Commission  
Page 6

Kyle's work. However, in connection with your audit of the CSE program, you did review Corporation Finance's review of Bear Stearns' 2006 Form 10-K, filed in February 2007, and, based on that *single* review, you have recommended what could be sweeping changes to Corporation Finance's full disclosure program. In our full disclosure program, we review the filings of more than 4,000 companies each year. I believe it is inappropriate for you to have reached conclusions, and to have made recommendations, about our program based upon your examination of our review of just *one* company's filings.

I believe, based on the scope of your audit work, that your comments and recommendations to Corporation Finance would have more appropriately focused on our full disclosure program as it relates to the CSE program. To the extent your recommendations do focus on Corporation Finance's interaction with the CSE program, I agree fully that we should examine the interaction between our reviews of the CSE firms and Trading and Markets' administration of the CSE program. For example, we will consider whether we should review CSE firms promptly after they make their annual Exchange Act filings and issue comments, if any, within a specific time period. We will discuss our thoughts on this with Trading and Markets. In addition, in Finding 7, you recommend that we should take concrete steps to improve our collaboration efforts with Trading and Markets and that we should determine whether the information Trading and Markets receives from the CSE firms would be helpful in our reviews of the filings these companies make. As you note, we were not able to respond to your questions during the audit about the potential usefulness of this information since we did not know what it was. Furthermore, as we previously conveyed to you, we are concerned about basing our comments to a company, which we will make public, on non-public information that a company provides to another Division or Office for different purposes. That being said, we will take steps to work closely with Trading and Markets to pursue this.

I appreciate your giving me the opportunity to present my views on your report and I very much appreciate your commitment to present this letter as an attachment to it. Doing so will allow readers to draw their own conclusions, and is consistent with the transparent full disclosure review process I and the staff of the Division of Corporation Finance are proud to administer.

Sincerely,

  
John W. White  
Director

## Office of Inspector General Response to Chairman Cox and Management Comments

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The Office of Inspector General (OIG) has received responses to its audit report entitled "SEC's Oversight of Bear Stearns and Related Entities: The Consolidated Supervised Entity Program" from Chairman Christopher Cox, the Division of Trading and Markets (TM), the Office of Compliance Inspections and Examinations (OCIE), the Division of Corporation Finance (CF), and the Office of Risk Assessment (ORA).

In total, the Commission's responsible management officials have concurred with 21 out of the 26 recommendations contained in the report.

### Response to the Chairman's Comments

We are particularly pleased that the Chairman has commented that he believes that the 26 specific recommendations are well-considered and worthy of support. We also appreciate his comment that the report provides an invaluable and fresh perspective for the agency to carefully review and consider.

### Response to the Comments of the Division of Trading and Markets (TM)

The OIG is pleased that TM concurred with 20 out of the 23 recommendations addressed to them in the OIG audit report. The OIG, however, is quite disappointed in many of the assertions made in TM's "Management's Commentary."

The OIG made supreme efforts throughout the entire audit process to engage and consult with TM on every aspect of the audit report. Over the five months of fieldwork, OIG auditors had weekly and sometimes daily conversations with TM management, including senior officials, on all issues relating to the audit work. In many cases, TM management did not provide full responses to questions posed and issues raised by the OIG.

It is important to point out that specifically because the OIG recognized that this audit involved numerous issues of a technical and complex nature, the OIG retained a renowned and highly-regarded expert on many aspects of the capital markets, and market microstructure in particular, to assist the OIG's efforts. The expert worked closely with the OIG's auditors, providing technical expertise and guidance. The expert also spent countless hours reviewing detailed notes and memoranda that TM staff had prepared during the time periods pertinent to the audit and conversed in detail with TM management and staff.

## APPENDIX VIII CONTINUED..

Even after having numerous conversations with TM staff throughout the audit field work, immediately prior to finalizing the draft report, the OIG convened a meeting with the Director of TM and several senior management officials to discuss the findings and recommendations in the report. TM officials stated that they were unable to provide any substantive responses without viewing the report in writing in its entirety.

Shortly after this meeting, the OIG also provided TM officials with an initial working draft of the report, complete with findings and recommendations, for their comment. TM management provided in response a red-lined version of the report and an additional memorandum containing substantive comments. OIG staff painstakingly reviewed both TM's redlined version of the report and its memorandum. Thereafter, the OIG incorporated many of TM's suggestions, including making major revisions to one finding, and removing another finding altogether. The OIG then provided TM with a second draft for comment and invited another round of substantive responses. The OIG also posed two separate sets of questions to TM officials regarding some of the assertions they had made in response to the working draft of the report. TM failed to provide any response to these two sets of questions.

Instead of responding to the OIG's questions or providing additional substantive suggestions regarding the OIG report, TM decided to issue its "Management's Commentary," which claims the report is flawed and inaccurate, and asserts that TM was not provided with a fair and meaningful opportunity to address the issues raised in the report. It is worth noting that notwithstanding the rhetoric contained in "Management's Commentary," TM concurred with nearly of the report's recommendations. Moreover, while the commentary asserts that the report is fundamentally flawed in all aspects, it provides only a few examples of actual statements being inaccurate, all of whom are relatively minor, even if true, and have no impact on overall findings and conclusions of the report.

We sincerely hope that the tone adopted in TM's "Management's Commentary" is not indicative of TM's unwillingness to take the OIG report and its findings seriously and responsibly as these matters are of utmost importance to the Commission and the country, particularly as lawmakers consider the administration's proposed unprecedented bailout of the nations' financial markets.

### Response to the Comments of the Office of Compliance Inspections and Examinations (OCIE)

The OIG is pleased that OCIE has concurred with all 3 recommendations addressed to it, and commented favorably on an additional recommendation.

Specifically, OCIE concurred that the development of a collaboration agreement that maintains a clear delineation of responsibilities between TM and OCIE

## APPENDIX VIII CONTINUED..

would improve the effectiveness of the oversight by both offices and that a joint TM, OCIE and Division of Investment Management task force led by the ORA to determine the costs and benefits of supervising firms with significant customer assets and unregulated affiliates could be very valuable in producing evidence supporting the need for consolidated oversight. OCIE also concurred with the recommendation that TM develop an ethics manual, agreeing that stringent ethics procedures should apply consistently to all SEC staff that perform examinations, and indicated that it would work with TM to develop an ethics manual for the CSE program.

### Response to the Comments of the Division of Corporation Finance (CF)

The OIG is disappointed that CF concurred with only 1 of the 3 recommendations addressed to it. The OIG also disagrees with several of the comments contained in the management response submitted by CF.

First, CF indicates that the OIG recommends what could be "sweeping changes" to its program. The OIG's finding concluded that CF has not established guidelines for the timeliness of second level filing reviews. We recommended that CF establish such guidelines and thereafter monitor compliance with the established guidelines. We do not view these improvements to be "sweeping changes" but rather reasonable and necessary management practices.

Second, CF points out that its current view of timeliness, as it pertains to the entire filing review process, is dictated by the requirements of Section 408 of the Sarbanes-Oxley Act (SOX) of 2002, as well its internal guideline of issuing comments before a company's next fiscal year-end. While these factors may guide the timeliness of filing reviews (and the issuance of comment letters) as a general rule, CF ignores the need to address high-risk filings in an expeditious manner. As evidenced by developments in recent years, a company's stock price can have a dramatic downward swing in a very short period of time. Under the particular circumstances involving Bear Stearns, we simply disagree that CF's review of its 2006 10-K was "timely."

Third, CF questions what value to investors an earlier release of its comment letter on Bear Stearn's 2006 10-K and the company's response would have had because those documents were heavily redacted when publicly disclosed. During our audit, we considered whether the information would still have been useful, even though it was redacted, and we concluded it would have been quite useful. Further, the OIG expert opined on the redacted version and found the information to be beneficial.

Fourth, CF notes that under Section 408 of SOX, it is not required to review every company each year, and there are many companies that are not reviewed at all in a given year. While this may be true, CF is overlooking a critical aspect of Section 408, which contemplates that CF will consider the risks associated



## APPENDIX VIII CONTINUED..

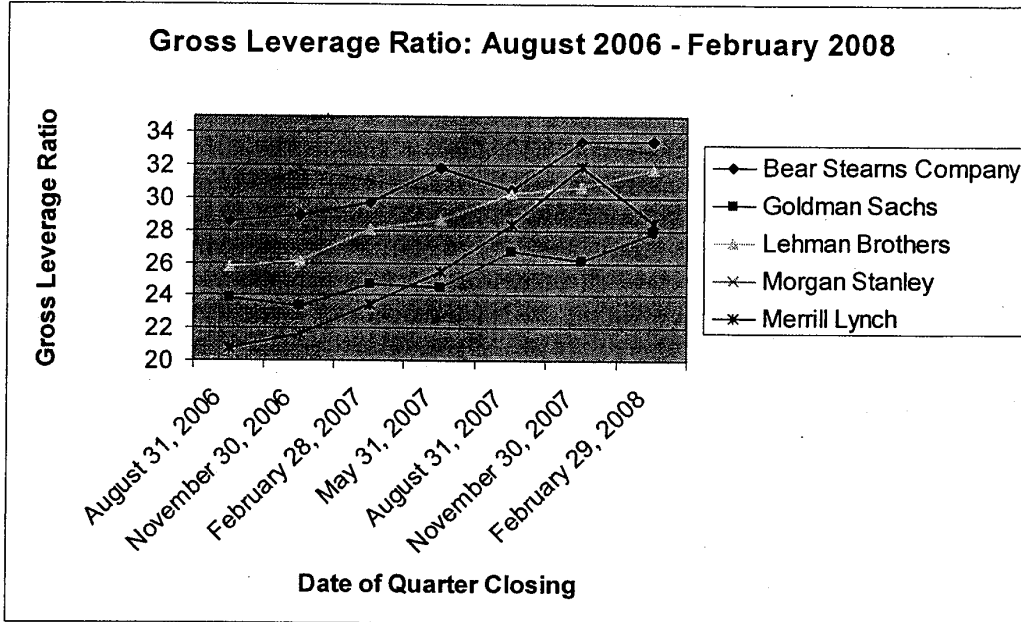
with filings when scheduling its filing reviews. Bear Stearns' 2006 10-K filing was high-risk, in our opinion, given the company's high exposure to subprime mortgages and, accordingly, should have been reviewed in a more timely manner.

Fifth and finally, CF maintains that investors do not use review correspondence, which may be heavily redacted, as a source of information on which to base investment decisions. In addition, CF explains the practice of publicly disclosing the comment letters and the associated responses as a relatively new development intended to increase the transparency of the review process and to make correspondence available to all interested person at no cost. However, according to SEC Insight (now known as Disclosure Insight), an independent and private investment research firm, CF's comment letters and responses can be quite beneficial to investors. In fact, it was stated by SEC Insight as follows:

The comment letter proposal [to make the comment letters public] provides one important means for *investors* to level the playing field with registrants [companies] by enhancing their ability to do what investors do best in transparent markets; that is, assess and discount risks. [Emphasis added].

# Gross Leverage Ratios

Figure 1. CSE Firms- Gross Leverage Ratios



Source: This data was provided by TM. They obtained the information from public filings (i.e., 10-K) and Bloomberg. We verified each firm's year-end gross leverage ratio amount, but did not verify its quarterly ratios.

## Criteria

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### Basel II Standards.

**Final Rule: Alternative Capital Requirements for Broker-Dealers That Are Part Of Consolidated Supervised Entities” (Release No. 34-49830).**<sup>201</sup> In 2004, the Commission adopted rule amendments under the Securities and Exchange Act of 1934 (which created the CSE program) that allowed firms (the broker-dealers) to apply for an exemption from the net capital rule and instead use the alternative capital method.

### TM's Policies and Procedures describing its administration of the CSE program.

**Publicly Disclosed Information about the CSE Program.**<sup>202</sup> The Commission has posted the following documents on its website about the CSE program:

- Program Overview & Assessment Criteria;
- Program Description; and
- SEC Holding Company Supervision With Respect To Capital Standards And Liquidity Planning.

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<sup>201</sup> Source: Final Rule: Alternative Net Capital Requirements for Broker-Dealers That Are Part of Consolidated Supervised Entities (69 Fed Reg. 34.428). Commission. 21 June 2004. <<http://www.sec.gov/rules/final/34-49830.htm>>.

<sup>202</sup> Source: SEC [Commission] Holding Company Supervision Program Description. Commission. 5 June 2008. <<http://www.sec.gov/divisions/marketreg/hcsupervision.htm>>.



U.S. Securities and Exchange Commission

Office of Inspector General

Office of Audits

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The SEC's Role Regarding and  
Oversight of Nationally Recognized  
Statistical Rating Organizations  
(NRSROs)



INTERNAL USE ONLY

August 27, 2009  
Report No. 458




OFFICE OF  
INSPECTOR GENERAL

UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549

**MEMORANDUM**

August 27, 2009

**To:** Mary L. Schapiro, Chairman  
John Walsh, Acting Director, Office of Compliance Inspections and Examinations  
Daniel M. Gallagher, Co-Acting Director, Division of Trading and Markets  
James Brigagliano, Co-Acting Director, Division of Trading and Markets  
David Becker, General Counsel, Office of the General Counsel  
William Lenox, Ethics Counsel, Office of the General Counsel  
James Overdahl, Chief Economist, Office of Economic Analysis  
Ethiopsis Tafara, Director, Office of International Affairs  
James Kroeker, Chief Accountant, Office of the Chief Accountant  
Jonathan Sokobin, Director, Office of Risk Assessment  
Meredith Cross, Director, Division of Corporation Finance  
Sharon Sheehan, Associate Executive Director, Office of Administrative Services

**From:** H. David Kotz, Inspector General 

**Subject:** *The SEC's Role Regarding and Oversight of Nationally Recognized Statistical Rating Organizations (NRSROs), Report No. 458*

This memorandum transmits the U.S. Securities and Exchange Commission (SEC) Office of Inspector General's (OIG) final report detailing the results of our review of the SEC's Role Regarding and Oversight of Nationally Recognized Statistical Rating Organizations (NRSROs). The review was conducted by the OIG as part of our continuous effort to assess the management of the Commission's programs and operations and was based on our audit plan.

We received and reviewed your comments to our draft report. Based on your input and our assessment of your comments, we revised the final report accordingly. The final report contains 24 recommendations that were developed to strengthen the SEC's oversight of NRSROs. All offices and divisions agreed to the final report's recommendations that were directed to them, except for some recommendations directed to the Division of Trading and Markets (TM).

Specifically, TM did not concur with Recommendation 24, and partially concurred with Recommendations 1, 2, 3, 4 and 7.

Within the next 45 days, please provide the OIG with a written corrective action plan that is designed to address the recommendations that were agreed upon in the report. At a minimum, the corrective action plan should include information such as the responsible official/point of contact; time frames for completing the required actions, milestone dates, and how your office/division will address the recommendations contained in the report.

Should you have any questions regarding this report, please do not hesitate to contact me. We appreciate the courtesy and cooperation that you and your staff extended to our office during this review.

#### Attachment

cc: Kayla J. Gillan, Deputy Chief of Staff, Office of the Chairman  
Diego Ruiz, Executive Director, Office of the Executive Director  
Darlene L. Pryor, Management Analyst, Office of the Executive Director

# The SEC's Role Regarding and Oversight of Nationally Recognized Statistical Rating Organizations (NRSROs)

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## Executive Summary

### Background

A credit rating is an opinion issue by a credit rating agency (CRA), as of a specific date, of the creditworthiness, i.e., the ability to repay timely loan principal and interest, of an issuer or with respect to particular securities or money market instruments. Credit ratings are utilized in a variety of capacities in the U.S. financial system, e.g., to calculate bank capital requirements, to place limits on the types of investments that may be purchased by a particular type of investor such as a pension fund.

The Securities and Exchange Commission ("SEC" or "Commission") first incorporated reliance on credit ratings into its rules and regulations in 1975 in connection with the rule specifying how broker-dealers must compute their net capital. In that rule, the Commission specified that a broker-dealer, in computing its net capital, could take a lesser deduction from its net worth as to securities that were rated as having a comparatively low chance of default according to a credit rating of national repute, or a "nationally recognized statistical rating organization" ("NRSRO").<sup>1</sup> Thereafter, the Commission incorporated the NRSRO concept into many rules and regulations issued under the Federal securities laws, and the term was also used in a number of Federal, state and foreign laws and regulations.

Until the enactment of the Credit Rating Agency Reform Act of 2006 ("Rating Agency Act"), NRSROs were not required to file any formal application with the Commission. From 1975 to 2006, the Commission identified NRSROs through the staff no-action letter process.<sup>2</sup> The Commission initially identified three CRAs as NRSROs: Moody's Investor Service Inc. ("Moody's"), the Standard & Poor's Division of the McGraw Hill Companies, Inc. ("S&P") and Fitch, Inc ("Fitch").

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<sup>1</sup> Throughout this report, the acronym "NRSRO" is used to refer both to the use of the term "nationally recognized statistical rating organization" in Commission regulations and no-action letters prior to the enactment of the Credit Rating Agency Reform Act of 2006 and to CRAs that are registered with the Commission under that Act. See the Background Section of the report at pp. 2-11 for additional information.

<sup>2</sup> See *infra* pp. 3-4 and n. 15 for a discussion of the no-action letter process.

While the Commission eventually identified a total of seven CRAs through the no-action letter process, Moody's, S&P and Fitch continued to dominate the credit rating industry.

Beginning with the issuance of a concept release in 1994, the Commission considered, but did not adopt, rules that would have, among other things, defined the term NRSRO and formalized the NRSRO no-action letter process. The CRAs became subject to harsh criticism after Enron Corporation ("Enron") filed for bankruptcy in 2001. In particular, a Senate committee staff report on Enron's bankruptcy strongly criticized the CRAs for failing to warn the public of Enron's precarious financial situation until four days before it declared bankruptcy.

After Enron's bankruptcy, the Commission's examination staff undertook examinations of the three NRSROs to aid the Commission in assessing whether it should continue to use credit ratings in its regulations and, if so, the categories of acceptable credit ratings and the appropriate level of oversight. The Commission's examinations revealed a number of significant concerns, including potential conflict of interest caused by issuers paying the NRSROs for their ratings, exacerbation of those conflicts of interest caused by the NRSROs' marketing of ancillary services to issuers, and the effectiveness of the Commission's examinations being hampered by, among other things, the lack of recordkeeping requirements tailored to NRSRO activities. The Commission also held two public hearings in 2002 on a wide variety of issues impacting CRAs.

In addition, the Sarbanes-Oxley Act of 2002 ("Sarbanes-Oxley Act") was enacted in response to several major corporate and accounting scandals, including Enron's bankruptcy, that shook the public's confidence in the United States ("U.S.") financial markets. The Sarbanes-Oxley Act, among other things, required the Commission to prepare a report on the role and function of CRAs. The Commission issued the report required by the Sarbanes-Oxley Act in 2003, which identified a wide range of issues pertinent to CRAs that warranted further examination. Also in that report, the Commission stated its intent to publish another concept release and thereafter issue proposed rules. While the Commission subsequently issued a concept release in 2003 and then proposed a rule to define the term NRSRO, the Commission adopted no rules setting conditions on NRSRO designation, despite the findings surrounding Enron's bankruptcy, the problems revealed by the 2002 examinations and the results of the study required by the Sarbanes-Oxley Act.

In September 2006, the Rating Agency Act was enacted in an effort to improve the quality of credit ratings for the protection of investors and in the public interest by increasing accountability, transparency and competition in the CRA industry. The Rating Agency Act for the first time required CRAs to register formally with the Commission in order to qualify as an NRSRO. The Rating Agency Act



established an application process for approval for a CRA to issue various classes of credit ratings as an NRSRO and required numerous pertinent disclosures in a CRA's application for NRSRO designation and in subsequent updates and annual certifications. The Rating Agency Act gave the Commission examination authority to ensure an NRSRO's compliance with its requirements and, since the fall of 2008, the Office of Compliance Inspections and Examinations ("OCIE") has been responsible for conducting these examinations. The Rating Agency Act, however, prohibited the Commission from regulating the substance of credit ratings or the procedures and methodologies by which NRSROs determine credit ratings.

The Rating Agency Act mandated that the Commission issue final rules and regulations necessary to carry out the Act's requirements within nine months after the date of enactment. The Commission adopted rules to implement the requirements of the Act in June 2007. Since the Rating Agency Act became effective, the Commission has received 11 applications from a total of ten CRAs seeking NRSRO designation, all of which have been approved.

The CRAs have once again come under criticism for the role they played in connection with the recent financial crisis. Specifically, the CRAs provided ratings on structured finance products that were based on risky or "subprime" mortgages. After home values decreased beginning in 2006, the market value of the mortgage securities declined, resulting in write-downs of billions of dollars in the value of mortgage securities. Serious questions then arose as to whether the CRAs initially rated the structured products accurately and whether they should have subsequently reassessed their credit ratings.

The role played by CRAs in the recent financial crisis has led to numerous reports and proposed regulatory changes, including the SEC's adoption of NRSRO rule amendments in February 2009. Other proposed changes to the Commission's NRSRO rules, however, have not been acted upon. In addition, both President Obama's Administration and Congress have recently proposed legislative reforms that would strengthen the SEC's oversight of NRSROs. Also, the Administration's legislative proposal would make registration with the Commission mandatory for all CRAs, not just those that choose to seek NRSRO designation.

## **Objectives**

Given the importance of NRSROs, we initiated this review in accordance with our audit plan. The objective was to identify improvements in the Commission's NRSRO oversight. The review focused on the implementation of and compliance with the Rating Agency Act and Commission rules. We also reviewed the Commission's history with NRSROs to assess the Commission's efforts to

oversee the NRSROs and to implement the Rating Agency Act's accountability, competition, and transparency objectives.

## Results

Overall, our review found that, despite the importance of NRSROs to the U.S. securities markets and the Commission's reliance on NRSROs in its rules and regulations, the Commission has historically been slow to act in this area, even after Enron's bankruptcy and a Senate staff report recommendation that the Commission set specific conditions on the NRSRO designation. While, beginning in 1994, the SEC issued concept releases, conducted examinations, issued reports, held hearings and proposed regulations, it adopted no regulations regarding NRSROs until required to do so after the Rating Agency Act was enacted in 2006. Further, our review identified certain instances of non-compliance with the requirements of the Rating Agency Act or Commission rules, as well as several areas in which we believe the SEC's oversight of NRSROs can be enhanced. The current SEC Chairman has, however, identified improving the quality of credit ratings as one of her priorities, directed the Commission staff to explore possible new NRSRO regulations and allocated additional resources to establish a branch of NRSRO examiners.

Most significantly, our compliance testing identified one NRSRO application that the Commission approved based upon the Division of Trading and Markets' ("TM's") recommendation, despite the fact that TM identified numerous significant concerns with the CRA's application. These included concerns about the adequacy of the CRA's managerial resources, suspicions regarding the accuracy of the financial information provided in its application, and concerns about the authenticity of a number of certifications required by the Rating Agency Act. Under the process established by the Rating Agency Act, within 90 days upon the filing of a CRA's application for NRSRO designation, the Commission must either approve the application or institute proceedings to determine whether the application should be denied, unless the applicant consents to a longer time period. The Rating Agency Act provides that the Commission shall grant the application except under certain circumstances, including where the CRA does not comply with the statutory requirements and if the CRA lacks adequate financial and managerial resources to consistently produce credit ratings with integrity and to materially comply with their disclosed procedures and methodologies.

In its recommendation to the Commission, TM acknowledged that its concerns about the CRA's application were unresolved but recommended that they be addressed in an examination of the firm to be conducted after the application was approved. Our review found that an examination of this firm was not initiated

until ten months after the Commission approved its application and that this examination still has not been completed. Moreover, our review disclosed that TM recommended that the Commission approve a second NRSRO application submitted by this same CRA to rate additional classes of securities, despite identifying many of the same concerns it had found with the previous application. Because the issues identified by TM were related to whether the firm had met the statutory eligibility requirements, our review concluded that in accordance with the provisions of the Rating Agency Act, TM should not have recommended that the Commission approve the CRA's application. Rather, TM should have recommended that the Commission institute proceedings to determine whether it should deny the application or have sought the CRA's consent to an additional period of time for the Commission to act on the application.

Our compliance testing also revealed that, while not to the same degree as with the application discussed above, TM identified numerous substantive concerns regarding the applications of several other CRAs. These included, among others, concerns about the financial condition of a CRA, the absence of required information regarding a CRA's process for rating structured products, and concerns about some CRAs' procedures for handling material non-public information. Despite these numerous issues, which we believe raised questions as to whether the approval of these applications was in the public interest, TM recommended that the Commission approve the applications and stated that it would address the issues after the applications were approved. Our review found risks in this approach and concluded that all significant issues should be resolved before TM recommends that the Commission approve a CRA's application for NRSRO registration, to the extent consistent with the Rating Agency Act.

The compliance testing we conducted further disclosed several instances where TM did not comply with, or require firms to comply with, certain procedural requirements of the Rating Agency Act and the Commission's implementing rules. For example, in two instances, TM, acting on its own, granted NRSROs extensions of time to file required annual certifications or reports when the applicable statute and regulation required such extensions to be granted by the Commission. The compliance testing also revealed instances where TM received and accepted forms or reports from NRSROs that did not include a required financial statement or certifications.

We also identified several areas in which our review found that the effectiveness of OCIE's NRSRO examination program could be improved. In particular, our review found that the Commission's ability to determine whether a CRA applying for NRSRO registration has met the requirements of the Rating Agency Act would significantly be enhanced if examinations were conducted as part of the application review process, rather than after the application has been approved.

If examinations had been conducted as part of the review process for the applications discussed above, it is likely that some of the significant issues TM identified with the applications could have been resolved before TM made a recommendation on those applications. While this proposal would require additional legislative authority, as well as greater staff resources, we note that legislation in the NRSRO area is currently being considered and Chairman Schapiro is devoting additional resources for an NRSRO examination branch.

Our review further disclosed a number of policy issues involving NRSROs that the Commission should address in order to enhance NRSRO oversight and improve the quality of credit ratings. These include: (1) requiring that a CRA seeking designation as an NRSRO submit financial statements that have been audited by an accounting firm that is regulated by the Public Company Accounting Oversight Board ("PCAOB"); (2) imposing further restrictions on the consulting and advisory services that NRSROs perform for issuers, underwriters or obligors that have paid the NRSROs for credit ratings; (3) requiring NRSROs to monitor and appropriately revise credit ratings on a periodic basis; (4) implementing a credit rating analyst rotation requirement in order to reduce the risk of undue pressure on credit rating analysts; (5) requiring enhanced disclosures by NRSROs regarding the credit ratings process, including the key assumptions used in credit ratings methodologies and procedures and any shortcoming of or limitations on credit ratings; (6) evaluating whether the quality of credit ratings is being negatively impacted by the revolving door, i.e., credit rating analysts leaving to work for an issuer as to which the analyst previously provided a credit rating; (7) conducting an assessment of the potential effects on competition in the NRSRO industry of the proposed amendments regarding the disclosure of material non-public information to other NRSROs, but not to CRAs that do have NRSRO destination; (8) recommending rules designed to address the problem of forum shopping for credit ratings, i.e., seeking a credit rating from multiple NRSROs and hiring the one that provides the highest credit rating, to reduce the potential harmful effects on the quality of credit ratings; and (9) soliciting and obtaining public comment on CRAs' applications for NRSRO registration. In addition, our review identified several areas in which the Commission's annual report to Congress, as required by the Rating Agency Act, could be improved.

### **Summary of Recommendations**

Our review determined that several improvements are needed to ensure compliance with the Rating Agency Act and the Commission's implementing regulations and to enhance NRSRO oversight.

Specifically, we made several recommendations designed to ensure compliance with the NRSRO application approval process established by the Rating Agency

Act. These included, among others, that TM (1) ensure that all significant issues identified in the application review process are resolved prior to TM recommending approval of the application by the Commission; (2) in consultation with the appropriate offices, evaluate whether action should be taken regarding the CRA that was granted NRSRO designation through two separate applications, despite the numerous significant problems identified with the applications; and (3) ensure that all pending issues previously identified during the NRSRO application process be resolved within six months of the date of the issuance of this report. We also recommended that TM, in consultation with other appropriate offices, request that the Office of General Counsel develop guidance to assist TM in deciding under what circumstances it should seek consent from an applicant to waive the 90-day statutory time period for Commission action on an NRSRO application, or recommend that the Commission institute proceedings to determine whether registration should be denied.

We also recommended, in order to ensure compliance with statutory and regulatory requirements pertaining to NRSROs, that TM (1) ensure in the future that it seeks Commission orders regarding NRSRO requests for extension of time when required by statute or the Commission's rules; and (2) ensure that CRAs applying for NRSRO registration and firms that are registered as NRSROs comply with the Commission's rules and requirements regarding the filing and certification of financial information.

In addition, our review made several recommendations designed to improve the effectiveness of OCIE's NRSRO examination program, including the seeking of legislative authority to conduct examinations of CRAs as part of the NRSRO application process, the inclusion of NRSROs in OCIE's pilot monitoring program, and obtaining an additional review of OCIE's NRSRO examination module by someone with industry expertise.

With regard to the numerous NRSRO policy issues that our review found the Commission should address to enhance its oversight of NRSROs, we made several recommendations pertaining to: (1) seeking legislative authority to require that NRSRO auditors be subject to oversight by the PCAOB; (2) performing examination work regarding and assessing the adverse effect of the provision of consulting and advisory service on the quality of credit ratings; (3) implementing a comprehensive credit rating monitoring requirement for NRSROs; (4) performing examination work regarding and assessing undue influence on credit rating analysts and the benefits of an analyst rotation requirement; (5) recommending additional disclosures about the credit ratings process; (6) examining and assessing whether the revolving door problem is negatively impacting the quality of credit ratings; (7) assessing the potential effects on competition in the credit rating industry of proposed amendments

regarding the disclosure of material non-public information to other NRSROs, but not to CRAs that do not have NRSRO designation; (8) recommending rules to reduce the potential harmful effects of forum shopping on the quality of credit ratings; and (9) incorporating the seeking and consideration of public comments into the NRSRO oversight process. Finally, we made several suggestions for including additional concepts identified by our review in the Commission's annual report to Congress regarding NRSROs.

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## Table of Contents

Executive Summary .....	i
Table of Contents .....	ix
Background .....	1
Objectives.....	17
Findings and Recommendations .....	18
Finding 1: All Significant Issues Identified with NRSRO Applications Should be Resolved During the Application Process.....	18
Recommendation 1 .....	24
Recommendation 2 .....	24
Recommendation 3 .....	24
Recommendation 4 .....	24
Recommendation 5 .....	24
Recommendation 6 .....	25
Finding 2: TM Granted Extensions of Time without Requesting Commission Orders as Required by Statute or Regulation, and Received and Accepted Forms or Reports that Did Not Comply with Commission Rules .....	25
Recommendation 7 .....	28
Recommendation 8 .....	29
Finding 3: The Effectiveness of the NRSRO Examination Program Should be Improved.....	30
Recommendation 9 .....	32
Recommendation 10 .....	33
Recommendation 11 .....	34
Finding 4: The Commission Should Address Several Policy Issues in Order to Improve NRSRO Oversight .....	34
Recommendation 12 .....	37
Recommendation 13 .....	42
Recommendation 14 .....	42
Recommendation 15 .....	44

Recommendation 16 .....	47
Recommendation 17 .....	47
Recommendation 18 .....	50
Recommendation 19 .....	52
Recommendation 20 .....	52
Recommendation 21 .....	54
Recommendation 22 .....	57
Recommendation 23 .....	58

Finding 5: The SEC's Annual Report to Congress on NRSROs Should be Improved.....	58
Recommendation 24 .....	60

Appendices

Appendix I: Acronyms.....	61
Appendix II: Scope and Methodology .....	63
Appendix III: Criteria .....	65
Appendix IV: List of Recommendations .....	67
Appendix V: Management Comments	
Office of the Chairman .....	74
Division of Trading and Markets.....	76
Office of Compliance Inspections and Examinations.....	101
Office of International Affairs .....	105
Office of Economic Analysis.....	108
Appendix VI: Office of Inspector General Response to Management's Comments.....	109

Tables

Table 1: Comparison of NRSRO Revenue from Other Services and Products vs. Total Revenue .....	41
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# The SEC's Role Regarding and Oversight of Nationally Recognized Statistical Rating Organizations (NRSROs)

## Background and Objectives

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### Background

#### The Role of Credit Rating Agencies

A credit rating is an opinion, as of a specific date, of the creditworthiness (i.e., the ability to timely repay loan principal and interest) of an issuer as an entity or with respect to particular securities or money market instruments, such as a corporate bond or a structured financial product.<sup>3</sup> Credit ratings do not speak to the likely market performance of a security and, among other things, do not address whether an investor should purchase, sell, or hold a security.<sup>4</sup> CRAs issue credit rating opinions using a system of letters (e.g., ranging from AAA to D) to reflect the relative creditworthiness of the issuer or the security.<sup>5</sup> As discussed below, the CRAs that have been approved by the Commission are referred to as Nationally Recognized Statistical Rating Organizations ("NRSROs").<sup>6</sup>

A credit rating can have significance in several respects, including the following examples:

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<sup>3</sup> See Securities and Exchange Commission, Report on the Role and Function of Credit Rating Agencies in the Operation of the Securities Markets, As Required by Section 702(b) of the Sarbanes-Oxley Act of 2002 (2003) ("2003 Sarbanes-Oxley Act Report"), <http://www.sec.gov/news/studies/credratingreport0103.pdf>, at 5; The Role and Impact of Credit Rating Agencies on the Subprime Credit Markets: Hearing before the S. Comm. on Banking, Housing and Urban Affairs, 110th Cong. (Sept. 26, 2007) (testimony of Vickie A. Tillman, Executive Vice President, Standard & Poor's Credit Market Services) ("Tillman 9/26/07 Testimony"), at 3. See also Section 3(a)(60) of the Securities Exchange Act of 1934 (Exchange Act), 15 U.S.C. § 78c(a)(60), for a definition of the term "credit rating."

<sup>4</sup> Tillman 9/26/07 Testimony at 3-4.

<sup>5</sup> Id. at 3. Section 3(a)(61) of the Exchange Act, 15 U.S.C. § 78c(a), defines a CRA as "any person (A) engaged in the business of issuing credit ratings on the Internet or through another readily accessible means, for free or for a reasonable fee, but does not include a commercial credit reporting company; (B) employing either a quantitative or qualitative model, or both, to determine credit ratings; and (C) receiving fees from either issuers, investors, or other market participants, or a combination thereof." CRAs are considered important "gatekeepers" similar to securities analysts, who evaluate the quality of securities, and auditors, who review firms' financial statements. See S. 1073, 111<sup>th</sup> Cong. § 2 (2009).

<sup>6</sup> See Section 3(a)(62) of the Exchange Act, 15 U.S.C. § 78c(a)(62), for a definition of the term "nationally recognized statistical rating organization" under the Rating Agency Act.

- A credit rating may affect an issuer's costs of raising capital (including the issuer's ability to access the capital markets);<sup>7</sup>
- Banks may use credit ratings when calculating their capital requirements under the supervisory standards of the Basel Committee on Banking Supervision ("Basel Committee");<sup>8</sup>
- A particular type of investor (e.g., a pension fund) may be prohibited from purchasing or holding securities that are below a certain investment grade based on the credit rating;<sup>9</sup> and
- Companies incorporate credit ratings into commercial contract provisions (e.g., credit rating triggers).<sup>10</sup>

### The Development of the NRSRO Concept

The Commission first used the term "NRSRO" in 1975 in connection with the adoption of its "net capital rule," Exchange Act Rule 15c3-1.<sup>11</sup> This Rule requires that a broker-dealer, when computing net capital, deduct from its net worth a certain percentage of the market value of its proprietary securities positions, known as a "haircut." In adopting Rule 15c3-1, the Commission determined that it was appropriate to apply a lower haircut to certain types of debt instruments held by a broker-dealer that were rated, depending upon the debt instrument, in one of the three or four highest categories of credit ratings by at least two of the "nationally recognized statistical rating organizations."<sup>12</sup>

Since 1975, the Commission has incorporated the NRSRO concept into many of the rules and regulations issued under the Securities Act of 1933, the Exchange Act and the Investment Company Act of 1940. For example, Commission Rule 2(a)-7 under the Investment Company Act of 1940 limits money market mutual fund investments to high quality short-term instruments, and uses NRSRO

<sup>7</sup> 2003 Sarbanes-Oxley Act Report at 4.

<sup>8</sup> "The Basel Committee consists of central bank and regulatory officials from 13 member countries and seeks to improve the quality of banking supervision worldwide, in part by developing broad supervisory standards. The Basel Committee's supervisory standards are also often adopted by nonmember countries." U.S. Gov't Accountability Office, Risk-Based Capital: Bank Regulators Need to Improve Transparency and Overcome Impediments to Finalizing the Proposed Basel II Framework, GAO-07-253 (Feb. 2007), <http://www.gao.gov/new.items/d07253.pdf>, at 1, n. 2.

<sup>9</sup> See H.R. 2990, the Credit Rating Agency Duopoly Relief Act of 2005: Hearing before the H. Comm. on Financial Services, 109th Cong. (November 29, 2005) (statement of Rapid Ratings Pty Ltd), <http://financialservices.house.gov/media/pdf/112905rr.pdf>, at 3.

<sup>10</sup> A credit rating trigger is a provision in a contract that results in adverse consequences to the borrower (e.g., the loan becomes due) if the issuer's credit rating is downgraded.

<sup>11</sup> 17 C.F.R. § 240.15c3-1.

<sup>12</sup> 17 C.F.R. § 240.15c3-1(c)(2)(vi)(E)(F), and (H).

ratings as benchmarks for establishing minimum quality investment standards.<sup>13</sup> Additionally, Congress incorporated the term “NRSRO” into a wide range of legislation, and a number of other Federal, state and foreign laws and regulations used the term “NRSRO.”<sup>14</sup>

### **The Commission’s Use of the No-Action Letter Process to Identify NRSROs**

Prior to the enactment of the Rating Agency Act in 2006, the Commission used the no-action letter process to identify CRAs as NRSROs for purposes of the Commission’s rules.<sup>15</sup> Initially, when NRSRO ratings were first incorporated into the net capital rule, the Commission staff determined, in a no-action letter, that because the ratings of Moody’s, S&P and Fitch were used nationally, the staff would raise no questions if these firms were used as NRSROs for the purposes of the net capital rule.<sup>16</sup> The Commission staff subsequently issued no-action letters identifying several other CRAs as NRSROs.<sup>17</sup> To determine whether to issue an NRSRO no-action letter to a CRA, the staff considered a number of criteria, the most important being that the CRA was nationally recognized, i.e., it was widely accepted in the U.S. as an issuer of credible and reliable ratings by the predominant users of securities ratings. The staff also reviewed the operational capability and reliability of the CRA.<sup>18</sup>

At the time the Rating Agency Act was enacted, a total of seven CRAs had been identified as NRSROs through the no-action letter process, although Moody’s, S&P and Fitch dominated the credit rating industry.<sup>19</sup> According to Congressional testimony, Commission staff did not act on some no-action letter requests from CRAs in a timely manner. For example, in 2004, the President

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<sup>13</sup> 17 C.F.R. § 270.2(a)-7.

<sup>14</sup> Proposed Rule: Definition of Nationally Recognized Statistical Rating Organization, Securities Act Release No. 33-8570 (Apr. 19, 2005), <http://www.sec.gov/rules/proposed/33-8570.pdf>, at 8.

<sup>15</sup> Through the SEC’s no-action letter process, “[a]n individual or entity who is not certain whether a particular product, service, or action would constitute a violation of the [F]ederal securities law may request a ‘no-action’ letter from the SEC staff. Most no-action letters describe the request, analyze the particular facts and circumstances involved, discuss applicable laws and rules, and, if the staff grants the request for no action, concludes that the SEC staff would not recommend that the Commission take enforcement action against the requester based on the facts and representations described in the individual’s or entity’s original letter.” <http://www.sec.gov/answers/noaction.htm>.

<sup>16</sup> Securities Act Release No. 33-8570 at 9.

<sup>17</sup> *Id.* at 9-10.

<sup>18</sup> *Id.* at 10.

<sup>19</sup> See Rating the Raters: Enron and the Credit Rating Agencies: Hearing before the S. Comm. on Governmental Affairs, 107<sup>th</sup> Cong. (Mar. 20, 2002) (statement of Sen. Joseph Lieberman, Chairman, S. Comm. on Governmental Affairs), <http://hsgac.senate.gov/032002lieberman.htm>.

and Chief Economist of LACE Financial Corporation (“LACE”) testified that it took the Division of Market Regulation (now TM) eight years to review its request for no-action relief (which was denied) and that LACE’s appeal was pending for over two years.<sup>20</sup> Similarly, the Managing Director of Egan-Jones Ratings Company (“EJR”) testified that EJR’s no-action letter request was still pending after approximately four and a half years.<sup>21</sup>

### **The Commission’s Reviews of CRAs Prior to the Enactment of the Rating Agency Act**

In addition to the SEC staff’s issuance of no-action letters, the Commission reviewed a number of issues pertaining to CRAs and how they should be regulated between 1994 and 2006, which are discussed below. However, none of these reviews led to the adoption of final regulations.

**1994 Concept Release.** In 1994, the Commission issued a concept release seeking public comment on a number of issues related to the Commission’s use of NRSRO ratings, including:

- Whether the Commission should continue to employ the NRSRO concept to distinguish various types of debt and other securities for purposes of its rules;
- Whether the Commission should define the term “NRSRO” for the purposes of all its rules and what, if any, objective criteria should be used in determining whether a CRA was an NRSRO for purposes of the Commission’s rules;
- Whether the current no-action letter process with respect to NRSROs was satisfactory or, if not, whether the Commission should establish alternative procedures for designating NRSROs;
- The practice of NRSROs charging issuers for credit ratings, and specifically whether it appropriate for an NRSRO to charge an issuer based on the size of the transaction being rated; and

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<sup>20</sup> The Ratings Game: Improving Transparency and Competition Among the Credit Rating Agencies: Hearing before the H. Comm. on Financial Services, 108<sup>th</sup> Cong. (Sept. 14, 2004) (statement of Barron Putnam, Ph.D., President and Chief Economist, LACE Financial Corporation), at 2.

<sup>21</sup> Rating the Rating Agencies: The State of Transparency and Competition: Hearing before the Subcomm. on Capital Markets, Insurance and Gov’t Sponsored Entities of the H. Comm. on Financial Services, 108<sup>th</sup> Cong. (April 2, 2003) (testimony of Sean J. Egan, Managing Director, Egan-Jones Ratings Company), <http://financialservices.house.gov/media/pdf/040203se.pdf>, at 5.

- The use of limited scope credit ratings that may not denote an assessment solely of the credit risk of an instrument.<sup>22</sup>

According to the Commission, it received 25 comment letters in response to the concept release, and most commenters supported continuing the NRSRO concept but desired a formalized process for approving NRSROs.<sup>23</sup> These commenters generally were of the view that the no-action procedures in place at the time did not provide sufficient guidance on how to submit an application for NRSRO recognition and the types of information that should be included in the application.<sup>24</sup> Commenters specifically recommended, therefore, that the Commission formalize the no-action criteria for recognizing NRSROs in a Commission rule.<sup>25</sup>

**1997 Proposed Rules.** As a result of the 1994 Concept Release, in 1997, the Commission proposed rules that would have defined the term “NRSRO,” established a list of attributes to be used by the Commission in identifying CRAs as NRSROs, and formalized the application process for NRSRO recognition.<sup>26</sup> The Commission did not act upon the 1997 rule proposal due to, among other things, the initiation of broad-based Commission and Congressional reviews of CRAs following Enron’s filing for bankruptcy in December 2001.<sup>27</sup>

**Enron Bankruptcy and Subsequent Congressional Investigation.** On December 2, 2001, Enron, along with its subsidiaries, filed for bankruptcy protection. At that time, Enron was the largest company to file bankruptcy in the nation’s history, and the company’s failure triggered a crisis in investor confidence in the U.S. capital markets.<sup>28</sup> In January 2002, the Senate Committee on Governmental Affairs launched a broad investigation into Enron’s collapse, “focusing on the role of government and the private sector watchdogs and the steps, if any, that could have been taken to detect Enron’s problems or prevent its failure.”<sup>29</sup> The Committee held a hearing to elicit information on why the CRAs “continued to rate Enron a good credit risk until four days before the

<sup>22</sup> Concept Release: Nationally Recognized Statistical Rating Organizations, Securities Act Release No. 33-7085 (Aug. 31, 1994), <http://www.sec.gov/rules/concept/34-34616.pdf>.

<sup>23</sup> 2003 Sarbanes-Oxley Act Report at 11.

<sup>24</sup> Id.

<sup>25</sup> Id.

<sup>26</sup> Proposed Rule: Capital Requirements for Brokers or Dealers under the Securities Exchange Act of 1934, Exchange Act Release No. 34-39457 (Dec. 17, 1997).

<sup>27</sup> 2003 Sarbanes-Oxley Report at 15.

<sup>28</sup> Staff of S. Comm. on Governmental Affairs, 107<sup>th</sup> Cong., Report on the Financial Oversight of Enron: The SEC and Private-Sector Watchdogs (Oct. 8, 2002)(“Senate Staff Report”), at 1.

<sup>29</sup> 2003 Sarbanes-Oxley Act Report at 16.

firm declared bankruptcy, and to determine how future Enron-type calamities could be avoided.”<sup>30</sup> Specifically, “[c]oncerns had been expressed regarding the significant market power of the three NRSROs, their privileged access to non[public issuer information, their apparent lack of care and diligence in the Enron situation, and their very limited regulatory oversight.”<sup>31</sup>

On October 8, 2002, the staff of the Senate Committee on Governmental Affairs issued a report that, among other things, criticized the CRAs for failing “to warn the public of Enron’s precarious situation until a mere four days before Enron declared bankruptcy.”<sup>32</sup> The Senate staff’s report also noted that the CRAs were subject to little, if any, formal regulation or oversight and that little existed to hold them accountable for future poor performance.<sup>33</sup> As a result, the staff report recommended, among other things, that the Commission, in consultation with certain other agencies, “set specific conditions on the NRSRO designation through additional regulation, to ensure that the reliance of the public on credit rating agencies is not misplaced.”<sup>34</sup>

**2002 NRSRO Examinations and Public Hearings on CRAs.** Beginning in March 2002, pursuant to a Commission formal order of investigation issued under Section 21(a) of the Exchange Act, Commission examination staff conducted examinations of each of the three NRSROs, all of which were registered with the Commission as investment advisers. The purpose of the order was to ascertain facts, conditions, practices, and other matters relating to the role of CRAs in the U.S. securities markets, and to aid the Commission in assessing whether to continue to use credit ratings in its regulations “and, if so, the categories of acceptable credit ratings and the appropriate level of regulatory oversight.”<sup>35</sup>

The Commission’s 2002 examinations of the NRSROs identified several concerns, including those relating to:

- (a) potential conflicts of interest caused by the fact that issuers pay the NRSROs for their ratings;
- (b) exacerbation of those conflicts of interest due to the marketing by the NRSROs of ancillary services to issuers, such as pre-rating assessments and corporate consulting, thereby heightening the NRSROs’ dependence on issuer revenue;
- (c) the potential for the NRSROs, given their

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<sup>30</sup> Id.

<sup>31</sup> Id. (footnote omitted).

<sup>32</sup> Senate Staff Report at 6. See also 2003 Sarbanes-Oxley Act Report at 17-18.

<sup>33</sup> 2003 Sarbanes-Oxley Act Report at 18.

<sup>34</sup> Id.

<sup>35</sup> Id. at 19.

substantial power in the marketplace, to improperly pressure issuers to purchase ancillary services; (e) the effectiveness of the NRSROs' existing policies and procedures designed to protect confidential information; and (f) the effectiveness of the Commission's examination being hampered by, among other things, the lack of recordkeeping requirements tailored to NRSRO activities, the NRSROs' assertions that the document retention and production requirements of the Investment Advisers Act of 1940 are inapplicable to the credit rating business, and their claims that the First Amendment shields the NRSROs from producing certain documents to the Commission.<sup>36</sup> [Footnote omitted.]

In November 2002, the Commission held two public hearings (i.e., roundtables) on a wide variety of issues affecting CRAs, including the current role and function of CRAs; information flow in the credit rating process; concerns regarding CRAs, such as potential conflicts of interest or abusive practices; and regulatory treatment of CRAs, including concerns about potential barriers to entry.<sup>37</sup>

**2003 Sarbanes-Oxley Act Report and Concept Release.** Subsequently, in January 2003, the Commission issued a report on the role and function of CRAs in accordance with Section 702(b) of the Sarbanes-Oxley Act.<sup>38</sup> As a result of its study, the Commission identified a wide range of issues that merited further examination and stated its intent to publish a concept release to address concerns related to CRAs and thereafter issue proposed rules.<sup>39</sup>

Accordingly, in July 2003, the Commission issued a concept release seeking public comment on 56 questions designed to evaluate further the issues identified in the January 2003 Sarbanes-Oxley Act report.<sup>40</sup> These questions

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<sup>36</sup> Id. at 19-20.

<sup>37</sup> See the transcripts of the November 15, 2002 and November 21, 2002 Commission hearings at <http://www.sec.gov/news/extra/credrate/credrate111502.txt>, and <http://www.sec.gov/news/extra/credrate/credrate112102.txt>, respectively.

<sup>38</sup> Pub. L. 107-204, § 702(b), 116 Stat. 745 (2002). Section 702 of the Sarbanes-Oxley Act required the Commission to submit a study to the President, the Committee on Financial Services of the House of Representatives and the Committee on Banking, Housing, and Urban Affairs of the Senate within 180 days following enactment of that statute examining the following topics: "(A) the role of credit rating agencies in the evaluation of issuers of securities; (B) the importance of that role to investors and the functioning of the securities markets; (C) any impediments to the accurate appraisal by credit rating agencies of the financial resources and risks of issuers of securities; (D) any barriers to entry into the business of acting as a credit rating agency, and any measures needed to remove such barriers; (E) any measures which may be required to improve the dissemination of information concerning such resources and risks when credit rating agencies announce credit ratings; and (F) any conflicts of interest in the operation of credit rating agencies and measures to prevent such conflicts or ameliorate the consequences of such conflicts." 2003 Sarbanes-Oxley Act Report at 3.

<sup>39</sup> 2003 Sarbanes-Oxley Act Report at 43-44.

<sup>40</sup> Concept Release: Rating Agencies and the Use of Credit Ratings under the Federal Securities Laws, Securities Act Release No. 33-8236 (June 4, 2003), <http://www.sec.gov/rules/concept/33-8236.htm>.

focused on “whether credit ratings should continue to be used for regulatory purposes under the [F]ederal securities laws and, if so, the process for determining whose credit ratings should be used, and the level of oversight to apply to” such CRAs.<sup>41</sup> A total of 46 commenters responded to the 2003 Concept Release, the majority of whom supported retention of the NRSRO concept but also supported improvements in the clarity of the process for identifying NRSROs.<sup>42</sup>

**2005 Proposed Rule.** In 2005, the Commission again proposed a rule to define the term “NRSRO.” The proposed definition contained three components that must be met in order for a CRA to qualify as an NRSRO.<sup>43</sup> However, according to the Commission, the proposal did not attempt to address many of the broader issuers raised in response to the 2003 Concept Release.<sup>44</sup> The proposal was not adopted. As a consequence, even after the focus on the NRSROs after Enron’s bankruptcy and the Senate Staff’s report’s specific recommendation that the Commission set specific conditions on the NRSRO designation, the Commission failed to adopt any rules to set conditions on the NRSRO designation until after the enactment of the Rating Agency Act in 2006. Moreover, while the Commission recognized that more explicit regulatory authority from Congress was necessary to conduct a rigorous program of NRSRO oversight,<sup>45</sup> the Commission took no “formal position on whether additional legislation should be forthcoming . . . .”<sup>46</sup>

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<sup>41</sup> Id. at 1.

<sup>42</sup> Proposed Rule: Definition of Nationally Recognized Statistical Rating Organization, Securities Act Release No. 33-8570 (April 19, 2005), <http://www.sec.gov/rules/proposed/33-8570.pdf>, at 17-18.

<sup>43</sup> The three components included: (1) limiting “the definition to entities that issue publicly available credit ratings that are current assessments of the creditworthiness of obligors with respect to specific securities or money market instruments;” (2) requiring a CRA to be generally accepted in the financial markets; and (3) requiring that “a credit rating agency uses systematic procedures designed to ensure credible and reliable ratings, manage conflicts of interest, and prevent the misuse of non[-]public information” and has “sufficient financial resources to ensure compliance with such procedures, if they are to meet the definition.” Id. at 21-22, 28 and 31.

<sup>44</sup> Id. at 4.

<sup>45</sup> The State of the Securities Industry: Hearing before the S. Comm. on Banking, Housing and Urban Affairs, 109<sup>th</sup> Cong. (Mar. 9, 2005) (testimony of William Donaldson, Chairman, U.S. Securities and Exchange Commission), [www.sec.gov/news/testimony/ts030905whd.htm](http://www.sec.gov/news/testimony/ts030905whd.htm), at 5.

<sup>46</sup> Reforming Credit Rating Agencies: The SEC’s Need for Statutory Authority: Hearing before the Subcomm. on Capital Markets, Insurance, and Gov’t Sponsored Enterprises of the H. Comm. on Financial Services, 109<sup>th</sup> Cong. (April 12, 2005) (testimony of Annette Nazareth, Director, Division of Market Regulation, U.S. Securities and Exchange Commission), [www.sec.gov/news/testimony/ts041205aln.htm](http://www.sec.gov/news/testimony/ts041205aln.htm), at 6. Ms. Nazareth did state that the Commission welcomed Congressional attention and “would stand ready to work with Congress on crafting appropriate legislation if Congress determine[d] such legislation [were] necessary.” Id.



## **The Credit Rating Agency Reform Act of 2006 and the Commission's Implementing Rules**

On September 29, 2006, former President Bush signed the Rating Agency Act into law. The legislative history accompanying the Rating Agency Act stated as follows:

Over the years, the SEC has been criticized at times for not awarding more NRSRO designations and thereby perpetuating an anticompetitive industry, and for failing to supervise and inspect NRSROs to ensure compliance with the [F]ederal securities laws and NRSRO requirements. NRSROs have been criticized by a broad array of interested parties with respect to conflicts of interest, ratings that significantly lag the markets, and anticompetitive and abusive business practices.<sup>47</sup>

The stated purpose of the Rating Agency Act was to “improve ratings quality for the protection of investors and in the public interest by fostering accountability, transparency, and competition in the credit rating agency industry.”<sup>48</sup>

The Rating Agency Act required CRAs to register formally with the Commission in order to qualify as an NRSRO.<sup>49</sup> The Rating Agency Act established an application process and required an applicant to disclose, among other things, its procedures and methodologies for developing credit ratings and for managing conflicts of interest.<sup>50</sup> A CRA may register to issue credit ratings as an NRSRO in the following five classes, or a combination of one or more of these classes:

- Financial institutions, brokers, or dealers;
- Insurance companies;
- Corporate issuers;
- Issuers of asset-backed securities; and
- Issuers of government securities, municipal securities, or securities issued by a foreign government.<sup>51</sup>

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<sup>47</sup> S. Rep. No. 109-326, at 2 (2006).

<sup>48</sup> Credit Rating Agency Reform Act of 2006, Pub. L. No. 109-291, 120 Stat. 1327 (2006).

<sup>49</sup> Section 15E(a) of the Exchange Act, 15 U.S.C. § 78o-7(a).

<sup>50</sup> A CRA seeking the NRSRO designation must file Form NRSRO with the Commission. A CRA can currently issue credit ratings without seeking the NRSRO designation. However, under certain circumstances, e.g., as required by investment guidelines, an issuer may be required to have a credit rating from an NRSRO.

<sup>51</sup> Section 3(a)(62) of the Exchange Act, 15 U.S.C. § 78c(a)(62).

The Commission must approve the CRA's application for NRSRO registration before it issues the credit ratings as an NRSRO for each class of credit rating.<sup>52</sup>

In addition to the initial application requirement, the Rating Agency Act also requires that each NRSRO promptly amend its application for registration if any information or document provided therein becomes materially inaccurate (with certain exceptions).<sup>53</sup> Further, each NRSRO must furnish to the Commission on an annual basis an amendment to its registration in such form as the Commission may prescribe by rule, certifying that the information and documents in the application for registration (with one exception) continues to be accurate, and listing any material change.<sup>54</sup> The Rating Agency Act also gave the Commission examination authority to ensure an NRSRO's compliance with the requirements of the Rating Agency Act.<sup>55</sup>

The Rating Agency Act required the Commission to issue in final form rules and regulations necessary to carry out the requirements of the Act, including the required application form, no later than 270 days after the date of enactment.<sup>56</sup> It also provided that "[t]he Commission shall issue final rules . . . to prohibit any act or practice relating to the issuance of credit ratings by a nationally recognized statistical rating organization that the Commission determines to be unfair, coercive or abusive . . . ."<sup>57</sup> However, under the Rating Agency Act, the Commission (or any State or political subdivision thereof) may not "regulate the substance of credit ratings or the procedures and methodologies by which any nationally recognized statistical rating organization determines credit ratings."<sup>58</sup>

The Commission's initial rules to implement the Rating Agency Act were adopted on June 5, 2007, and became effective on June 26, 2007 (except for the rule and form prescribing the NRSRO application process, which became effective immediately).<sup>59</sup> On June 28, 2007, the Commission announced that the seven CRAs that had previously been identified as NRSROs had all applied to be

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<sup>52</sup> Section 15E(a)(2) of the Exchange Act, 15 U.S.C. § 78o-7(a)(2).

<sup>53</sup> Section 15E(b) of the Exchange Act, 15 U.S.C. § 78o-7(b).

<sup>54</sup> *Id.*

<sup>55</sup> Section 17(a)(1) of the Exchange Act, 15 U.S.C. § 78q(a)(1).

<sup>56</sup> Section 15E(n) of the Exchange Act, 15 U.S.C. § 78o-7(n).

<sup>57</sup> Section 15E(i) of the Exchange Act, 15 U.S.C. § 78o-7(i).

<sup>58</sup> Section 15E(c)(2) of the Exchange Act, 15 U.S.C. § 78o-7(c)(2).

<sup>59</sup> Final Rule: Oversight of Credit Rating Agencies Registered as Nationally Recognized Statistical Rating Organizations, Exchange Act Release No. 34-55857 (June 5, 2007), <http://www.sec.gov/rules/final/2007/34-55857.pdf>. See 17 C.F.R. §§ 240.17g-1 through 240.17g-6 for the Commission's rules regarding NRSROs.

registered with the Commission as NRSROs and could continue to represent themselves and act as NRSROs during the pendency of their applications.<sup>60</sup>

On September 24, 2007, the Commission issued its first orders approving seven CRAs' applications for NRSRO registration under the Rating Agency Act.<sup>61</sup> The Office of Financial Responsibility within TM is responsible for rulemaking pertinent to NRSROs and evaluating NRSRO activities to assess competition in the industry. OCIE is currently responsible for conducting NRSRO examinations.<sup>62</sup> Other SEC offices, such as the Office of Economic Analysis, provide input to TM and OCIE with respect to the NRSROs.

### **The CRAs' Involvement in the Recent Credit Crisis**

In the early 2000s, lenders began to offer mortgages to individuals who did not meet the typical qualifications (e.g., income level or credit history).<sup>63</sup> Many of these mortgage loans had teaser rates<sup>64</sup> and/or were interest-only mortgages (i.e., the entire monthly payment is for interest and does not reduce the loan principal). These riskier mortgage loans are generally referred to as "subprime" mortgages or loans. The theory behind lenders offering these riskier mortgage loans was that the homeowner would be able to refinance the mortgage loan in a few years because of the increased growth in home values and the individual's improved credit rating. Lenders converted these mortgage loans into securities and sold the securities to other firms (known as the "securitization process").

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<sup>60</sup> Press Release, Securities and Exchange Commission, Credit Rating Agencies Apply for Registration as Nationally Recognized Statistical Rating Organizations (June 28, 2007), [www.sec.gov/news/press/2007/2007-124.htm](http://www.sec.gov/news/press/2007/2007-124.htm).

<sup>61</sup> Press Release, Securities and Exchange Commission, Seven Credit Rating Agencies Register with SEC as Nationally Recognized Statistical Rating Organizations (Sept. 24, 2007), [www.sec.gov/news/press/2007/2007-199.htm](http://www.sec.gov/news/press/2007/2007-199.htm). The Commission subsequently approved NRSRO applications of three other CRAs and, as a consequence, there are currently ten NRSROs.

<sup>62</sup> After the Rating Agency Act became effective, former SEC Chairman Christopher Cox assigned TM the examination responsibility for the NRSROs. However, TM had not yet established a fully functional NRSRO examination program when the recent credit crisis surfaced. As a result, staff from TM, OCIE, and OEA performed a joint examination of Moody's, S&P and Fitch (see discussion below). Thereafter, in the fall of 2008, former Chairman Cox transferred primary examination responsibility for the NRSROs to OCIE. According to OCIE, on October 22, 2008, OCIE received an e-mail from former Chairman Cox's office giving it permission to begin additional NRSRO examinations, and OCIE sent document requests to four NRSROs on the following day, October 23, 2008. We previously found that TM had similar delays in establishing an examination program for Consolidated Supervised Entities (i.e., investment banks), see OIG Audit Report 446-A, dated September 25, 2008.

<sup>63</sup> Proposed Rules for Nationally Recognized Statistical Rating Organizations, Exchange Act Release No. 34-57967 (June 16, 2008), <http://www.404.gov/rules/proposed/2008/34-57967.pdf>, at 3 and n. 1.

<sup>64</sup> A teaser rate is a low introductory interest rate that is used to attract a borrower. See [http://www.fdic.gov/regulations/examinations/credit\\_card/pdf\\_version/ch21.pdf](http://www.fdic.gov/regulations/examinations/credit_card/pdf_version/ch21.pdf).

Beginning in mid-2006, home values decreased and mortgage loan defaults started to increase, causing the market value of the mortgage securities to decline.<sup>65</sup> In the ensuing months, the financial services industry wrote down billions of dollars in the value of mortgage securities, which, in accordance with Generally Accepted Accounting Principles (“GAAP”), must be valued at market value. The CRAs played a critical role in these events because there are serious questions as to whether the CRAs initially rated the mortgage securities (i.e., structured products) accurately and whether they should have subsequently reassessed their credit ratings.<sup>66</sup>

### **The Commission’s Response to the CRAs’ Involvement in the Recent Credit Crisis**

As a result of the CRAs’ involvement in the recent credit crisis, the Commission undertook several measures to improve NRSRO oversight.<sup>67</sup> For example, beginning in August 2007, Commission staff conducted examinations of S&P’s, Moody’s, and Fitch’s processes for rating subprime Residential Mortgage Backed Securities (RMBS) and Collateralized Debt Obligations (CDO). In July 2008, the Commission’s staff issued a public summary report of issues identified in the staff’s examinations that found as follows:

- there was a substantial increase in the number and in the complexity of RMBS and CDO deals since 2002, and some of the rating agencies appear to have struggled with the growth;
- significant aspects of the ratings process were not always disclosed;
- policies and procedures for rating RMBS and CDOs can be better documented;

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<sup>65</sup> Exchange Act Release No. 34-57967 at 3.

<sup>66</sup> Technical Committee of the International Organization of Securities Commissions (“IOSCO”), *The Role of Credit Rating Agencies in Structured Financial Markets, Final Report (“IOSCO Report”)* (May 2008), <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD270.pdf>, at 2; Financial Stability Forum, *Report of the Financial Stability Forum on Enhancing Market and Institutional Resilience* (Apr. 7, 2008), [http://www.fsforum.org/publications/r\\_0804.pdf](http://www.fsforum.org/publications/r_0804.pdf), at 32; Press Release, New York Attorney General, Attorney General Cuomo Announces Landmark Reform Agreements with the Nation’s Three Principal Credit Rating Agencies (June 5, 2008) (“NYAG Press Release”), [http://www.oag.state.ny.us/media\\_center/2008/jun/june5a\\_08.html](http://www.oag.state.ny.us/media_center/2008/jun/june5a_08.html).

<sup>67</sup> Other regulators also took actions because of CRAs’ involvement in the recent credit crisis. For example, in June 2008, the New York Attorney General reached an agreement with S&P, Moody’s, and Fitch on a series of reforms for rating RMBSs, see NYAG Press Release. In addition, an IOSCO Task Force analyzed the role that CRAs played in the structured finance market and made recommendations for improvement, see IOSCO Report. Further, the European Union (EU) has approved a regulation on CRAs, see Council of the European Union, *Proposal for a Regulation of the European Parliament and of the Council on Credit Rating Agencies* (Apr. 28, 2009) (“EU Regulation”). The European Council approved the proposed regulation on July 27, 2009.

- the rating agencies are implementing new practices with respect to the information provided to them;
- the rating agencies did not always document significant steps in the ratings process -- including the rationale for deviations from their models and for rating committee actions and decisions -- and they did not always document significant participants in the ratings process;
- the surveillance processes used by the rating agencies appear to have been less robust than the processes used for initial ratings;
- issues were identified in the management of conflicts of interest and improvements can be made; and
- the rating agencies' internal audit processes varied significantly.<sup>68</sup>

The staff's report also summarized generally the remedial actions that the examined NRSROs indicated they would take as a result of the examinations that were conducted, and described the Commission's proposed rules, which, if adopted, would require the NRSROs to take further actions.<sup>69</sup>

On February 2, 2009, the Commission issued a release adopting rule amendments that were designed to address practices identified, in part, by Commission staff during the examinations discussed above.<sup>70</sup> In summary, these rule amendments required an NRSRO (1) to provide enhanced disclosure on Form NRSRO of performance measurements statistics and the procedures and methodologies used to determine credit ratings for structured finance products and other debt securities; (2) to make, keep and preserve additional records under Rule 17g-2; (3) to make publicly available a random sample of 10 percent of the ratings histories of issuer-paid credit ratings in each class of credit ratings for which it is registered, with specified updates; and (4) to furnish the Commission with an additional annual report.<sup>71</sup>

<sup>68</sup> Staff of the Office of Compliance Inspections and Examinations, Division of Trading and Markets and Office of Economic Analysis, Securities and Exchange Commission, Summary Report of Issues Identified in the Commission Staff's Examinations of Select Credit Rating Agencies (July 2008)(2008 Summary Report), <http://www.sec.gov/news/studies/2008/craexamination070808.pdf>, at 1-2. OCIE has not yet closed these examinations. OCIE issued deficiency letters to the three firms that included a six month follow-up review, and OCIE staff is still assessing and overseeing compliance measures by the NRSROs before closing the examinations.

<sup>69</sup> 2008 Summary Report at 2.

<sup>70</sup> Rule: Amendments to Rules for Nationally Recognized Statistical Rating Organizations, Exchange Act Release No. 34-59342 (Feb. 2, 2009), <http://www.sec.gov/rules/final/2009/34-59342.pdf>,

<sup>71</sup> Id. at 5.

The Commission issued another release on February 2, 2009, either re-proposing or proposing rule amendments that would:

- require the public disclosure of credit rating histories for all outstanding credit ratings issued by an NRSRO on or after June 26, 2007, that were “paid for by the obligor being rated or by the issuer, underwriter, or sponsor of the security being rated;” and
- amend “its conflict of interest rule to prohibit an NRSRO from issuing a rating for a structured finance product paid for by the product’s issuer, sponsor, or underwriter unless the information about the product provided to the NRSRO to determine the rating and, thereafter, to monitor the rating is made available to other persons.”<sup>72</sup>

These re-proposed or proposed rule amendments are still pending. Several other significant NRSRO rulemaking proposals have also not been adopted, including proposals to:

- Amend rules under the various security law provisions that rely on NRSRO credit ratings in an effort “to address concerns that the reference to NRSRO ratings in Commission rules may have contributed to an undue reliance on NRSRO ratings by market participants.”<sup>73</sup>
- Require an NRSRO that is rating a structured finance product to publish a report “describing how the credit ratings procedures and methodologies and credit risk characteristics for structured finance products differ from

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<sup>72</sup> Proposed Rules: Re-proposed Rules for Nationally Recognized Statistical Rating Organizations, Exchange Act Release No. 34-59343 (Feb. 2, 2009), <http://www.sec.gov/rules/proposed/2009/34-59343.pdf>, at 1.

<sup>73</sup> Proposed Rule: Reference to Ratings of Nationally Recognized Statistical Rating Organizations, Investment Company Release No. IC-28327 (July 1, 2008). See also Proposed Rule: References to Ratings of Nationally Recognized Statistical Rating Organizations, Exchange Act Release No. 34-58070 (July 1, 2008), <http://www.sec.gov/rules/proposed/2008/34-58070.pdf>; Proposed Rule: Security Ratings, Securities Act Release No. 33-8940 (July 1, 2008), <http://162.138.185.34/rules/proposed/2008/33-8940.pdf>. A recent report by the Department of Treasury on financial regulatory reform stated that “[r]egulators should reduce their use of credit ratings in regulations and supervisory practices, wherever possible.” Dep’t of the Treasury, Financial Regulatory Reform, A New Foundation: Rebuilding Financial Supervision and Regulation (June 2009) (“Treasury Report”), [http://www.financialstability.gov/docs/regs/FinalReport\\_web.pdf](http://www.financialstability.gov/docs/regs/FinalReport_web.pdf), at 46. The Department of the Treasury “will work with the SEC and the President’s Working Group on Financial Markets to determine where references to ratings can be removed from regulations.” Press Release, Dep’t of the Treasury, Fact Sheet: Administration’s Regulatory Reform Agenda Moves Forward Credit Rating Agency Reform Legislation Sent to Capitol Hill (July 21, 2009) (“Treasury Fact Sheet”), <http://www.treas.gov/press/releases/tg223.htm>, at 2. Also, both a recently-introduced Senate bill and a recent legislative proposal by the Obama Administration would require the Government Accountability Office to study the appropriateness of relying on ratings for use in Federal, State, and local securities and banking regulations. S. 1073, 111<sup>th</sup> Cong. (2009), § 6; Treasury Fact Sheet at 2; Subtitle C-Improvements to the Regulation of Credit Rating Agencies of Title IX-Additional Improvements to Financial Markets Regulation (“Administration Legislative Proposal”), § 933. [http://www.financialstability.gov/docs/regulatoryreform/titleIX\\_subtC.pdf](http://www.financialstability.gov/docs/regulatoryreform/titleIX_subtC.pdf).

those of other types of rated instruments such as corporate and municipal debt securities,” or alternatively “to use ratings symbols for structured finance products that differentiated them from the credit ratings for other types of debt securities.”<sup>74</sup>

- Prohibit unfair, coercive, or abusive conduct involving on the part of NRSROs involving unsolicited credit ratings (i.e., ratings that a CRA “decides to issue without being requested to do so by an issuer, obligor, underwriter, or other interested party”).<sup>75</sup> Commenters on this proposal expressed concerns that it was overbroad and feared that it would prohibit legitimate business activities that are not coercive, and the Commission did not adopt the proposed rule. The former Director of TM stated that TM “would like to gain a better understanding through [the] examination function of how credit rating agencies define ‘unsolicited credit ratings’ and the practices they employ with respect to these ratings.”<sup>76</sup> We understand that OCIE is reviewing the issue of unsolicited credit rating in the process of ongoing NRSRO examinations.

In February 2009, newly-appointed SEC Chairman Mary Schapiro stated that one of her priorities was “[i]mproving the quality of credit ratings by addressing the inherent conflicts of interest credit rating agencies face as a result of their compensation models and limiting the impact of credit ratings on capital requirements of regulated financial institutions.”<sup>77</sup> On April 15, 2009, the Commission held a hearing regarding its recent NRSRO rulemaking initiatives pertaining to conflicts of interest, competition, and transparency.<sup>78</sup>

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<sup>74</sup> Proposed Rules for Nationally Recognized Statistical Rating Organizations, Exchange Act Release No. 34-5967 (June 16, 2008), <http://www.404.gov/rules/proposed/2008/34-57967.pdf>, at 97. The recent Department of Treasury Report stated that “[c]redit rating agencies should differentiate the credit ratings that they assign to structured credit products from those they assign to unstructured debt.” Treasury Report at 46. A recent legislative proposal by the Obama Administration would require CRAs to use different symbols for structured finance products to indicate the disparate risks associated with these products. Treasury Fact Sheet at 2; Administration Legislative Proposal, § 932.

<sup>75</sup> Proposed Rule, Oversight of Credit Rating Agencies Registered as Nationally Recognized Statistical Rating Organizations, Exchange Act Release No. 34-55231 (Feb. 23, 2007), <http://www.sec.gov/rules/proposed/2007/34-55231.pdf>, at 43, 135.

<sup>76</sup> Erik Sirri, former Director, Division of Market Regulation, Remarks before the SEC Open Meeting: Final Rules Implementing the Credit Rating Agency Reform Act of 2006 (May 23 2007), <http://www.sec.gov/news/speech/2007/spch052307ers.htm>, at 3.

<sup>77</sup> Mary L. Schapiro, Chairman, Securities and Exchange Commission, Address to Practicing Law Institute’s “SEC Speaks in 2009” Program (February 6, 2009), <http://www.sec.gov/news/speech/2009/spch020609mls.htm>, at 3.

<sup>78</sup> Press Release, Securities and Exchange Commission, SEC Roundtable to Examine Oversight of Credit Rating Agencies (Mar. 6, 2009), <http://www.sec.gov/news/press/2009/2009-46.htm>.

## Recent White House and Legislative Proposals for Increased Regulation of CRAs

In addition to the Commission's recent focus on NRSROs, both the Obama Administration and Congress have begun efforts to tighten government oversight of CRAs. For example, in June 2009, the Department of Treasury released its proposal for reform of the U.S. financial regulatory system that includes a recommendation that the SEC continue its efforts to strengthen the regulation of credit rating agencies in several respects.<sup>79</sup>

On May 19, 2009, Senator Jack Reed (D-R.I.) introduced a bill to provide for credit rating reforms entitled the Rating Accountability and Transparency Enhancement Act of 2009 (the "RATE Act").<sup>80</sup> This bill would provide for increased Commission oversight of NRSROs, particularly in the areas of internal controls over the procedures and methodologies for determining credit ratings, the management of conflicts of interest, the designation of a compliance officer and transparency of credit rating methodologies and information reviewed.<sup>81</sup> It would also require the Commission to establish an office that administers the Commission's rules with respect to the practices of NRSROs for determining credit ratings.<sup>82</sup>

More recently, on July 21, 2009, the Obama Administration sent Congress a legislative proposal designed to tighten government oversight of CRAs and to stem potential conflicts of interest in their business practices. According to the Department of Treasury's press release:

The legislation would . . . work to reduce conflicts of interest at credit rating agencies while strengthening the [SEC's] authority over and supervision of rating agencies. In recent years, investors were overly reliant on credit rating agencies that often failed to accurately describe the risk of rated products. This lack of transparency prevented investors from understanding the full nature of the risks they were taking. The Administration's legislation would tighten oversight of credit rating agencies, protect investors from inappropriate rating agency practices, and bring increased transparency to the credit rating process.<sup>83</sup>

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<sup>79</sup> Treasury Report at 46.

<sup>80</sup> S. 1073, 111<sup>th</sup> Cong. (2009). A companion measure was introduced in the House of Representatives by Representative Tom Rooney (R-Fla.) on July 14, 2009, H.R. 321, 111<sup>th</sup> Cong. (2009).

<sup>81</sup> *Id.*, § 3.

<sup>82</sup> *Id.*

<sup>83</sup> Treasury Fact Sheet at 1.



Significantly, among numerous other reforms (some of which are already contained in the RATE Act), the Administration's legislative proposal would make registration with the Commission mandatory for all CRAs, not just those that choose to apply for NRSRO designation.<sup>84</sup> The Administration's proposal would also require the SEC to conduct reviews of the internal controls, due diligence, and implementation of all ratings methodologies for all NRSROs at least annually, although the Commission may delegate these reviews as necessary to the PCAOB.<sup>85</sup>

## Objectives

Given the importance of NRSROs, we initiated this review in accordance with our audit plan. The objective was to identify improvements in the Commission's NRSRO oversight. The review focused on the Commission's implementation of and compliance with the Rating Agency Act and Commission rules. We also reviewed the Commission's history with NRSROs to assess the Commission's efforts to oversee NRSROs and to implement the Rating Agency Act's accountability, competition, and transparency objectives.

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<sup>84</sup> Id at. 2. Chairman Schapiro testified that her "personal belief is that legislation to require mandatory registration by credit rating agencies would be a significant step forward in making sure that this sector of the market is brought under regulatory oversight without the danger that some credit rating agencies may fail to register in order to avoid regulation." Regulatory Perspectives on the Obama Administration's Financial Regulatory Reform Proposals: Hearing before the Comm. on Financial Services, 111<sup>th</sup> Cong. (July 22, 2009)(testimony of Mary L. Schapiro, Chairman, Securities and Exchange Commission)("7/22/09 Schapiro Testimony"), <http://www.sec.gov/news/testimony/2009/ts072209mls.htm>, at 8.

<sup>85</sup> Treasury Fact Sheet at 2; Administration Legislative Proposal, § 932. While the RATE Act requires similar internal control reviews by the Commission, it allows the Commission to determine the frequency of those reviews. S. 1073, 111<sup>th</sup> Cong. (2009), § 3.

# Findings and Recommendations

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## **Finding 1: All Significant Issues Identified with NRSRO Applications Should be Resolved During the Application Process**

TM identified significant issues during the process of reviewing CRA applications for registration as NRSROs. Before these issues were resolved, TM recommended that the Commission issue orders approving the CRAs' applications to become NRSROs, and the Commission approved the orders. Based on the significant issues that TM identified (many of which were related to the eligibility requirements specified in the Rating Agency Act), our review found that there are serious questions as to whether the approval of at least one CRA's applications was in the public interest.

Section 15E(a)(2)(A) of the Exchange Act requires that the Commission take action on an application (i.e., either approve the application or institute proceedings to determine whether the application should be denied) within 90 days of the filing of the application, unless the applicant consents to a longer time period.<sup>86</sup> Under the statute, the Commission shall grant the application unless the CRA does not comply with the statutory requirements, the CRA "does not have adequate financial and managerial resources to consistently produce credit ratings with integrity and to materially comply" with their disclosed procedures and methodologies and certain statutory provisions, or the CRA, if registered, would be subject to suspension or revocation.<sup>87</sup>

We performed testing for compliance with the Rating Agency Act and implementing rules by obtaining and reviewing 11 application submissions from ten CRAs and TM's action memoranda recommending that the Commission

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<sup>86</sup> 15 U.S.C. § 78o-7(a)(2)(A).

<sup>87</sup> 15 U.S.C. § 78o-7(a)(2)(C)). The Commission is authorized by statute to, by order, "censure, place limitations on the activities, functions, or operations of, suspend for a period not exceeding 12 months, or revoke the registration of any" NRSRO if the Commission finds, on the record after notice and opportunity for hearing, that such action "is necessary for the protection of investors and in the public interest and that the NRSRO, or any person associated therewith, has engaged in certain specified conduct." 15 U.S.C. § 78o-7(d).

designate these CRAs as NRSROs. We also reviewed other pertinent materials, such as each NRSRO's required annual financial reports.<sup>88</sup>

Based on our review of that documentation, our review found that there are serious questions as to whether the approval of the application of one CRA (EJR) in December 2007, as well as its subsequent application in December 2008, was in the public interest, given the significant issues that TM identified with the applications. The issues involving this CRA's initial application, as described in TM's action memorandum to the Commission, included the following:

- Concerns about the adequacy of the CRA's managerial resources, including the experience of its compliance officer. Neither the Act nor the Commission's rules prescribe minimum qualifications for NRSRO compliance officers.<sup>89</sup>
- Suspicions about the accuracy of the financial information provided in the CRA's application. The firm's auditor was not subject to oversight by the PCAOB, as is discussed below.
- Questions as to the authenticity of a number of the initial ten Qualified Institutional Buyer (QIB) certifications submitted by the CRA. Ultimately, the CRA submitted ten certifications that complied with the Rating Agency Act and the instructions to Form NRSRO.<sup>90</sup>
- Questions about whether the subscriber fees charged by the CRA were reasonable, based upon the information provided by the CRA. TM noted that neither the Rating Agency Act nor its legislative history provided specific guidance on how the Commission should determine whether a fee was reasonable. TM concluded that "given the scant guidance in the statute as to how to evaluate the reasonableness of an applicant's fees and the staff's limited information on subscriber fees in general," it did not recommend at this time that the Commission find the CRA's fees to be unreasonable.<sup>91</sup> TM also stated, "We believe there are compelling reasons to find that certain levels of fees are unreasonable; however, the emphasis in the legislative history that the statute was designed to

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<sup>88</sup> Our compliance testing is described in more detail in Appendix II, "Scope and Methodology."

<sup>89</sup> Both the RATE Act and the Administration's legislative proposal would require each NRSRO to designate a compliance officer and specify the duties of, and limitations on, that compliance officer. S. 1073, 111<sup>th</sup> Cong. (2009), § 3; Administration Legislative Proposal, § 932.

<sup>90</sup> These certifications are required by Section 15E(a)(1)(B)(ix) of the Exchange Act, 15 U.S.C. § 78o-7(a)(1)(B)(ix), unless the CRA had received NRSRO status through a no-action letter prior to August 2, 2006, see Section 15E(a)(1)(D) of the Exchange Act, 15 U.S.C. § 78o-7(a)(1)(D). The term "Qualified Institutional Buyer" is defined in 17 C.F.R. § 230.144A(a)(1).

<sup>91</sup> Action Memorandum to the Commission from TM, subject: Application of EJR to register with the Commission as an NRSRO (Dec. 14, 2007) ("Dec. 14, 2007 Action Memorandum), at 2

accommodate subscriber-based credit rating agencies cannot be ignored.”<sup>92</sup>

- Concerns about the high volatility of the credit ratings issued by the CRA. While TM noted that there could be appropriate explanations for the ratings volatility, it indicated that it would be difficult to determine the causes of the volatility until an examination of the CRA was conducted.
- Concerns that the CRA “provided a much less detailed description” of its credit rating process than did the other NRSROs. This lack of detailed disclosure could impair an investor’s ability to understand the CRA’s credit rating process. TM stated that if the CRA’s application were approved, the staff would discuss with the CRA “how it could improve its discourse by providing a more detailed explanation of its credit ratings procedures.”<sup>93</sup> TM concluded, however, that the CRA substantially provided the information required.
- A concern that the CRA did not list specific policies and procedures for managing conflicts of interest. However, TM noted that the CRA did require that all ratings be reviewed by a rating committee, thus providing some level of assurance that no one analyst could unduly influence a rating. TM believed that the CRA’s policy and procedure to manage the conflict of interest that could arise when a subscriber requests a credit rating could be enhanced.

Although none of these significant issues were resolved, TM recommended that the Commission approve this CRA’s application. In its recommendation, TM informed the Commission as follows:

Given the 90-day application timeframe, staff resources, and the design of the Rating Agency Act that the application process be based primarily on information submitted by the applicant, we have not attempted to verify the accuracy of the financial information [provided by the CRA] or determine whether the applicable policies and procedures have been implemented. We believe the best approach to resolve these concerns would be to include these issues in an examination of the firm.<sup>94</sup>

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<sup>92</sup> Id. at 7. The staff identified the issue of unreasonable subscriber fees with two other CRA applications for NRSRO designation. However, based on TM’s action memoranda, it appears that the evidence was not as compelling with the other CRAs as it was with the CRA discussed above. According to OCIE, during the ongoing NRSRO examinations, the staff are gathering raw data on subscriber fees to enable an assessment of the reasonableness of those fees.

<sup>93</sup> Id. at 11.

<sup>94</sup> Id. at 2-3.

During the review, TM staff informed us that, at the time it recommended approval of the CRA's application, they only had suspicions and concerns but lacked evidence. TM staff also stated that they did not believe that the CRA would consent to a further extension of the 90-day requirement.<sup>95</sup> Moreover, TM staff did not believe that a proceeding to determine whether registration should be denied could be resolved within the specified statutory-time frame.<sup>96</sup> Finally, TM staff explained that they were reluctant to recommend instituting proceedings to determine whether registration should be denied because the Rating Agency Act was relatively new, and the staff were unable to obtain clarity regarding certain of the terms used in the applicable provisions of the statute. Consequently, TM staff believed that there was a significant chance the Commission would not prevail in a proceeding to deny the CRA's application.

We also learned during our review that although TM had recommended that the concerns it identified with the CRA's application be resolved through an examination of the firm, an examination of this CRA was not initiated until ten months after the Commission issued the order approving its application in December 2007, and this examination is still ongoing. Our review further disclosed that this same CRA was approved to issue additional classes of credit ratings in December 2008. When reviewing this subsequent application, TM identified many of the same issues it had identified with the previous application the Commission had approved. Accordingly, our review found that instead of issuing an order designating this CRA as an NRSRO, TM should have either recommended that the Commission institute proceedings to determine whether it should deny the applications, or sought consent from the CRA to waive the 90-day statutory requirement to allow TM additional time to address the issues identified with the applications.

In addition to the significant problems identified with the application discussed above, TM identified significant issues with the applications of other CRAs that TM recommended for Commission approval. These issues included the following, as described in TM's action memoranda to the Commission:

- There was concern about the financial condition of a CRA (Dominion Bond Rating Service Limited ("DBRS")). Specifically, the auditor of the CRA's

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<sup>95</sup> According to TM staff, the CRA reluctantly consented to a two-day extension to enable the staff to have the Commission approve the order granting the CRA's application.

<sup>96</sup> Under the Rating Agency Act, a proceeding to determine whether registration should be denied must "be concluded not later than 120 days on which the application for registration is furnished to the Commission . . ." 15 U.S.C. § 78o-7(a)(2)(B)(i)(II). However, "[t]he Commission may extend the time for conclusion of such proceeding for not longer than 90 days, if it finds good cause for such extension and publishes its reasons for so finding, or for such longer period as to which the applicant consents." 15 U.S.C. § 78o-7(a)(2)(B)(iii).

European affiliate issued a going concern audit opinion<sup>97</sup> on the affiliates. Further, TM stated that it did “not have information concerning the financial resources of the owners of [the CRA] and its affiliates or whether the owners have any legal obligation to support the affiliates.”<sup>98</sup> TM concluded: “Should [the CRA’s] revenues decrease, it is not clear that it could continue to operate at the same level without support from its owners. However, the staff believes that [the CRA] will have sufficient financial resources if its revenue continues as it has in the past.”<sup>99</sup>

- One CRA (Japan Credit Rating Agency (“JCR”)) did not submit the required information regarding its credit rating process for structured products, and this information was not on the CRA’s website. TM concluded that the CRA substantially provided the information required and indicated it would discuss the issue with the CRA, if its application were approved.
- Three CRAs (JCR, Rating and Investment Information Inc. (“R&I”) and Realpoint LLC (“Realpoint”)) provided information on the largest users of their credit rating services, as required by Exhibit 10 of Form NRSRO. However, TM was concerned that some of the users may actually be affiliated with one another. TM, therefore, wanted the CRAs to provide an aggregate revenue amount at the conglomerate level. TM staff stated that they would discuss the issue with the CRAs if the applications were approved.
- TM was concerned about the procedures of two CRAs (A.M. Best Company, Inc. (“A.M. Best”) and R&I) for handling material non-public information. TM concluded that the CRAs substantially provided the information required and would discuss the issue with the CRAs if their application were approved.
- TM could not determine, because of the table headings used, whether the amounts contained on a chart submitted by one CRA (A.M. Best) conformed to the required financial disclosures. TM stated that it would discuss the issue with the CRA if the application were approved.

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<sup>97</sup> The American Institute of Certified Public Accountant’s Statement on Auditing Standards No. 59, The Auditor’s Consideration of an Entity’s Ability to Continue as a Going Concern, requires an auditor to evaluate whether substantial doubt exists about an audit client’s ability to continue as a going concern. When the auditor concludes that such substantial doubt exists, the audit report should include an explanatory paragraph to reflect this uncertainty or, alternatively, the auditor may choose to issue a disclaimer of opinion upon the financial statements.

<sup>98</sup> Action Memorandum to the Commission from TM, subject: Application of DBRS to register with the Commission as an NRSRO (Sept. 11, 2007), at 4.

<sup>99</sup> Id.

- One CRA (A.M. Best) did not categorize its revenue or provide a list of the line items in each category, as required on Exhibit 12 of Form NRSRO, among other disclosure issues.<sup>100</sup> TM concluded that the CRA substantially provided the information required and would discuss the issue with the CRA if the application were approved.
- Based upon the information provided in the application of one CRA (R&I), TM was unable to determine if the CRA adequately documented its conflicts of interest procedures for ensuring that a single issuer does not provide ten percent or more of an NRSRO's total net revenue during a fiscal year. Nevertheless, TM concluded that the CRA had substantially provided the required information, but stated that it would recommend that the CRA document these procedures if the Commission approved the CRA's application.

Although TM identified these numerous substantive concerns regarding the applications of several CRAs that were related to the Rating Agency Act's eligibility requirements, TM nonetheless recommended that the Commission designate all of these CRAs as NRSROs. Several of these issues raise questions as to whether it was in the public interest for the Commission to approve these CRAs' applications. In all of these instances as with the CRA application discussed in detail above, TM stated that it would address the issues after the Commission issued the order approving the CRAs' applications.

We believe that there is risk in the approach adopted by TM and the Commission of resolving problems identified with a CRA's application subsequent to the application's approval. Under this approach, there is no specified time frame within which these issues must be addressed. TM stated that some of the issues it identified during the application process have not yet been resolved partially because OCIE has not yet examined every NRSRO.<sup>101</sup> Further, there is no guarantee that the CRA will adequately implement any recommended corrective actions. Therefore, with respect to the other CRA applications where TM identified significant problems, our review found that TM should have resolved these issues before recommending that the Commission grant a CRA's application for NRSRO registration to the extent consistent with the Rating Agency Act.

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<sup>100</sup> TM also identified issues with the disclosure of revenues by four other CRAs (EJR, LACE, Moody's and R&I).

<sup>101</sup> OCIE stated that it is aware of the issues identified by TM and has incorporated, or will incorporate, them into its NRSRO examinations.

**Recommendation 1:**

The Division of Trading and Markets (TM) should ensure that all significant issues identified in the application review process are resolved before it recommends that a credit rating agency (CRA) be registered as a Nationally Recognized Statistical Rating Organization. One way to resolve issues would be to require that the Office of Compliance Inspections and Examinations complete an examination of a CRA before TM makes a recommendation on the application to the Securities and Exchange Commission (which would require additional legislative authority, see Recommendation 9).

**Recommendation 2:**

The Division of Trading and Markets, in consultation with the Office of Compliance Inspections and Examinations (OCIE) and the Office of Economic Analysis, should evaluate whether action should be taken regarding the credit rating agency (CRA) that was granted registration as a Nationally Recognized Statistical Rating Organization (NRSRO), despite the numerous significant problems identified with its applications. These actions could include, as deemed appropriate, making a referral to the Division of Enforcement for consideration of censure, suspension, or other remedies specified in Section 15E(d) of the Securities Exchange Act of 1934. The evaluation should consider any new information obtained (e.g., from the OCIE examination of the CRA) since the CRA's applications were approved.

**Recommendation 3:**

The Division of Trading and Markets should ensure that all pending issues identified during the application process involving the credit rating agencies that the Securities and Exchange Commission approved as Nationally Recognized Statistical Rating Organizations are resolved within six months of the date of issuance of the Office of Inspector General's report.

**Recommendation 4:**

The Division of Trading and Markets, in consultation with the Office of Economic Analysis and the Office of Compliance Inspections and Examinations, should develop measures for determining whether subscriber fees charged by the credit rating agencies are reasonable.

**Recommendation 5:**

The Division of Trading in Markets (TM), in consultation with the Office of Compliance Inspections and Examinations, the Office of Economic Analysis, and



the Office of Risk Assessment, should request that the Office of General Counsel develop guidance regarding the types of deficiencies, (e.g., overly broad disclosures) that should prompt TM either to (1) seek consent from the applicant to waive the 90-day statutory time period for granting an application for registration as a Nationally Recognized Statistical Rating Organization (NRSRO), or (2) recommend instituting proceedings to determine whether registration should be denied.

**Recommendation 6:**

The Division of Trading and Markets and the Office of Compliance Inspections and Examinations should take appropriate actions to inform Nationally Recognized Statistical Rating Organizations about the Commission's expectations regarding the experience of their compliance officers.

**Finding 2: TM Granted Extensions of Time without Requesting Commission Orders as Required by Statute or Regulation, and Received and Accepted Forms or Reports that Did Not Comply with Commission Rules**

During our compliance testing (as described in Appendix II), we found two examples where TM granted NRSROs an extension of time to file required documents on its own, without recommending that the Commission provide the relief by order, as required by statute or regulation. Our review also revealed instances where TM received and accepted forms or reports from firms that did not include a financial statement or certifications required by Commission rule.

**Failure to Seek Commission Orders for an Extension of Time as Required by Statute or Regulation**

As noted above, Section 15E(b) of the Exchange Act requires each NRSRO to furnish to the Commission an amendment to Form NRSRO on an annual basis, not later than 90 days after the end of each calendar year, certifying that the information and documents and documents in the application for NRSRO registration continue to be accurate, and listing any material change to such information or documents that occurred during the previous calendar year.<sup>102</sup>

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<sup>102</sup> 15 U.S.C. § 78o-7(b). See also 17 C.F.R. § 240.17g-1(f).

The Commission has authority under Section 36 of the Exchange Act to, “by rule, regulation, or order, . . . conditionally or unconditionally exempt any person security, or transaction, or any class or classes of persons, securities, or transactions from any provision or provision of this title or of any rule or regulation hereunder, to the extent that such exemption is necessary or appropriate in the public interest, and is consistent with the protection of investors.”<sup>103</sup>

In addition, Commission Rule 17g-3(a) requires an NRSRO to furnish the Commission with several financial reports on an annual basis, not more than 90 calendar days after the end of its fiscal year.<sup>104</sup> As this rule was initially adopted, the required financial reports included:

- (1) Audited financial statements of the NRSRO or audited consolidated financial statements of its parent if the NRSRO is a separately identifiable division or department of the parent;
- (2) if applicable, unaudited consolidating financial statements of the parent of the NRSRO that include the NRSRO;
- (3) an unaudited financial report providing information concerning the NRSRO’s revenue in four different categories for the fiscal year;
- (4) an unaudited financial report providing the total aggregate and median annual compensation of the NRSRO’s credit rating analysts for the fiscal year; and
- (5) an unaudited financial report listing the 20 largest issuers and subscribers, based on net revenue, that used credit rating services provided by the NRSRO during the last fiscal year.<sup>105</sup>

Under Rule 17g-3(c), “[t]he Commission may grant an extension of time or an exemption with respect to any requirements in this section either unconditionally or on specified terms and conditions on the written request of [an NRSRO] if the

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<sup>103</sup> 15 U.S.C. § 78mm(a)(1).

<sup>104</sup> 17 C.F.R. § 240.17g-3(a).

<sup>105</sup> 17 C.F.R. § 240.17g-3(a)(1)-(5). The Commission amended its rules on February 2, 2009, to require the filing of an additional report, i.e., an “unaudited report of the number of credit ratings actions (upgrades, downgrades, placements on credit watch, and withdrawals) taken during the fiscal year in each class or credit ratings” for which the NRSRO is registered with the Commission. 17 C.F.R. §240.17g-3(a)(6). See Exchange Act Release No. 34-59342 at 35.

Commission finds that such extension or exemption is necessary or appropriate in the public interest and consistent with the protection of investors.”<sup>106</sup>

Our review found two examples, as described below, where TM granted NRSROs an extension of time to file the annual Form NRSRO certification and/or the required annual reports on its own, without seeking an order from the Commission.

First, one NRSRO (A.M. Best) did not file its annual Form NRSRO certification and financial reports for 2008 within 90 days, as required by Section 15E(b) of the Exchange Act and Commission Rule 17g-3(a). Specifically, these documents were due on March 31, 2009. However, this NRSRO requested an extension of the March 31, 2009 deadline for filing the Form NRSRO annual certification to no later than April 10, 2009.<sup>107</sup> The NRSRO informed TM that the requested extension was made in order to allow the NRSRO to complete the additional work required as a result of the recently adopted amendments to the NRSRO rules, which would become effective on April 10, 2009.<sup>108</sup> The NRSRO explained that the granting of the requested extension would “relieve [it] from the burden of filing two separate documents within the span of a few days and the burden on Commission staff of reviewing each separate filing.”<sup>109</sup> According to the March 25, 2009 letter from the NRSRO, TM verbally granted the requested extension. TM staff stated that they believed that, given the short length of the extension, the most efficient way to provide the requested relief was through the no-action letter process. The NRSRO’s annual Form NRSRO certification was dated April 8, 2009, and the Commission received the firm’s annual financial reports on April 10, 2009.

Second, another NRSRO (LACE) requested an extension of 30 days to file its required annual financial reports for the fiscal year ended December 31, 2008, which were due on March 31, 2009.<sup>110</sup> This NRSRO’s stated reasons for requesting the extension were that its previous auditor resigned on February 5, 2009, that it had recently engaged a new auditor, and that the 30-day extension should provide enough time for completion of the audit.<sup>111</sup> TM consulted with the

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<sup>106</sup> 17 C.F.R. § 240.17g-3(c)(emphasis added).

<sup>107</sup> Letter from David A. Brey, Vice President, A.M. Best to Thomas McGowan, Assistant Director of TM (Mar. 25, 2009)(“Brey Letter”).

<sup>108</sup> Id. See Exchange Act Release No. 34-59342. With one exception, all of the amendments adopted by the Commission on February 2, 2009, were effective as of April 10, 2009.

<sup>109</sup> Brey Letter.

<sup>110</sup> Letter from Michael A. Macchiaroli, Associate Director, TM, to Barron Putnam, Owner and Advisor, LACE (Apr. 7, 2009), at 1.

<sup>111</sup> Id.

Office of the Chairman and was informed that the Chairman had no objection to giving the NRSRO the requested 30-day extension.<sup>112</sup> However, we found no record that the other Commissioners were informed of this issue.

TM then issued a no-action letter to the NRSRO, stating that based on the information provided by the NRSRO, TM would not recommend enforcement action to the Commission if the NRSRO furnished the required financial reports for fiscal year 2008 “not more than 30 calendar days after March 31, 2009.” The NRSRO submitted its annual financial reports on April 29, 2009.

In both of the examples described above, TM granted extensions to NRSROs to the 90-day filing requirements of the Exchange Act and the Commission’s rules on its own, without seeking orders from the Commission. While the Commission has general exemptive authority under the Exchange Act and the Commission may grant extensions of time under Rule 17g-3(c), TM had no authority to grant these extensions without seeking orders from the Commission. As a result of TM’s actions, the Commission was denied the ability to determine whether the requested extensions were necessary or appropriate in the public interest and consistent with the protection of investors.

**Recommendation 7:**

The Division of Trading and Markets should ensure that it seeks Commission orders in response to requests by Nationally Recognized Statistical Rating Organizations for extensions of time when required by statute or the Commission’s rules.

**TM Failed to Require Compliance with Certain Commission Requirements and Rules Regarding Financial Reports and Certifications**

As is discussed below, our compliance testing revealed that, TM did not direct a firm to submit a required financial statement and, in several instances, ignored the Commission’s requirement that the firms’ required annual financial reports be appropriately certified.

First, the Commission requires a firm to file a statement of cash flows both in connection with its initial application for NRSRO designation and as part of its annual audited financial statements.<sup>113</sup> Our review found that one NRSRO (JCR)

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<sup>112</sup> Id. at 1-2.

<sup>113</sup> See Instructions to Exhibit 11 of Form NRSRO and 17 C.F.R. § 240.17g-3(a)(1)(i). Under Section 15E(a)(1)(B)(x) of the Exchange Act, 15 U.S.C. § 78o-7(a)(1)(B)(x), the Commission may require the submission of “any other information and documents concerning the applicant and any person associated with such applicant as the Commission, by rule, may prescribe as necessary or appropriate in the public interest or for the protection of investors.” The Commission approved the instruction to Exhibit 11 of Form NRSRO on June 5, 2007, see Exchange Act Release No. 34-55957.

did not file a statement of cash flows either during the application process, or as part of the required annual financial reports for fiscal years 2007 and 2008. TM staff informed us that they were not aware that the NRSRO had not filed the required statements of cash flows until this matter was brought to their attention during the review.

Second, Commission Rule 17g-3(b) requires an NRSRO to attach to each financial report furnished pursuant to Rule 17g-3(a) "a signed statement by a duly authorized person associated with the [NRSRO] that the person has responsibility for the report and, to the best knowledge of the person, the financial report fairly presents, in all material respects, the financial condition, results of operations, cash flows, revenues, [and] analyst compensation . . . of the [NRSRO] for the period presented." We found during our review that two NRSROs (EJR for fiscal year 2007 and Moody's for fiscal years 2007 and 2008) did not provide certifications for their annual financial reports as required by Rule 17g-3(b). TM pointed out that these NRSROs attached the annual financial reports required by Rule 17g-3(b) to their annual Form NRSRO filing, which included a certification that the information and statements contained in the Form, including Exhibits and Attachments, were accurate in all significant respects. Further, several NRSROs (EJR and LACE for fiscal year 2008, and JCR and DBRS for fiscal years 2007 and 2008) submitted only one certification to cover all of the annual financial reports, instead of submitting a separate certification for each financial report, as Rule 17g-3(b) requires.

TM staff stated that they did not believe the NRSROs' failures to provide the certifications specified in Rule 17g-3(b) constituted a material failure to comply with the rule because the ability to hold the NRSROs accountable for furnishing false information in their annual financial reports to the Commission was not impaired. Nonetheless, TM agrees that NRSROs should use the proper certification method for the annual reports as required under Rule 17g-3. TM stated that it is, therefore, recommending that the Commission amend the instructions to Form NRSRO to clarify that the Rule 17g-3 reports are to be certified as required by the rule and not using the certification specified for the Form NRSRO submission. TM also agrees to monitor the Form NRSRO and Rule 17g-3 annual report submissions more closely to verify that they are appropriately certified and contain the required information.

#### **Recommendation 8:**

The Division of Trading and Markets should ensure that credit rating agencies applying for designation as Nationally Recognized Statistical Rating Organizations (NRSROs) and firms that have registered as NRSROs comply with

the Commission's rules and requirements regarding the filing and certification of financial information.

### **Finding 3: The Effectiveness Of The NRSRO Examination Program Should Be Improved**

Our review identified several recommendations that would improve the effectiveness of the NRSRO examination program, including conducting examinations before the Commission issues an order approving a CRA's application for NRSRO registration.

#### **Conducting Examinations Before Issuing Orders Approving Applications**

Under the Rating Agency Act, the Commission shall grant a CRA's application for NRSRO designation under the following circumstances:

- if the Commission finds that the requirements of Section 15E of the Exchange Act are met; and
- unless the Commission finds that the CRA "does not have adequate financial and managerial resources to consistently produce credit ratings with integrity and to materially comply with the procedures and methodologies disclosed" in its application, as well as the statutory provisions concerning prevention of misuse of non-public information, management of conflicts of interest, prohibited conduct, and designation of compliance officers; or if the applicant were registered, its registration would be subject to suspension or revocation under the Act.<sup>114</sup>

The Commission must either issue an order approving the application or institute proceedings to deny the application within 90 days, unless the CRA consents to a longer period of time.<sup>115</sup>

The Rating Agency Act does not provide the Commission with any express authority to conduct examinations of CRAs prior to approval of their applications for NRSRO registration.<sup>116</sup> As noted above, prior to the enactment of the Rating Agency Act, OCIE encountered difficulties in obtaining documents from the

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<sup>114</sup> 15 U.S.C. § 78o-7(a)(2)(C).

<sup>115</sup> 15 U.S.C. § 78o-(a)(2)(A).

<sup>116</sup> TM believes, however, that the Commission has authority to examine issues pertinent to an application of an existing NRSRO to issue additional classes of credit ratings.

NRSROs to conduct examinations.<sup>117</sup> OCIE currently does not conduct examinations until sometime after a CRA's application for NRSRO registration has been approved.<sup>118</sup> As a consequence, TM does not have the benefits of examination results when deciding what recommendation to make to the Commission regarding a pending NRSRO application.

Our review found that the Commission could significantly enhance its ability to determine whether a CRA meets the requirements of the Rating Agency Act, if an examination were conducted as part of the application review process. For example, during the application process for one CRA (EJR), as previously discussed, TM was concerned about several significant issues, including the following:

- TM had suspicions regarding the accuracy of the financial information submitted in the CRA's application, and the adequacy of its managerial resources (e.g., the compliance officer's experience).
- TM found that the CRA's credit ratings were volatile. The staff noted that there could be appropriate explanations for the volatility, but that these explanations would be difficult to ascertain until an examination of the CRA was conducted.

TM concluded that the best way to address its concerns about this CRA's application was through the examination process after the Commission issued an order approving the CRA's application. However, an examination of this NRSRO was not begun until ten months after the Commission approved its initial application, and the examination of this NRSRO is still pending. Finally, as of the date of this report, OCIE has not yet examined three other NRSROs (JCR, R&I and Realpoint) at all, despite the fact that TM identified substantive concerns with their applications.

If OCIE conducted examinations of CRAs while their applications for NRSRO registration were pending, the examinations could focus on and address the types of issues described above. Further, OCIE would be able to determine whether a CRA has adequate books and records prior to its obtaining NRSRO registration.<sup>119</sup> OCIE has identified at least one CRA (LACE) that does not have adequate books and records; however, this determination was made after the Commission approved the CRA's application for NRSRO registration. Retention and production of adequate documents and e-mail are essential in order for the

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<sup>117</sup> 2008 Summary Report at 7-9.

<sup>118</sup> Moreover, these examinations have not necessarily been conducted immediately after approval of an NRSRO's application.

<sup>119</sup> 17 C.F.R. §240.17g-2 specifies the records that are required to be made and retained by NRSROs.

staff to conduct examinations.<sup>120</sup> Finally, by conducting an examination of a CRA during the application process, OCIE could evaluate the adequacy of the disclosures made in the CRA's application (e.g., it could determine whether the disclosures are too broad and more specification is required). As previously discussed, TM identified several instances during the application process where CRAs' disclosures were questionable.

For all of these reasons, therefore, we believe that conducting examinations prior to the approval of NRSRO applications would greatly enhance the Commission's NRSRO application approval process. While this proposal would likely require additional staff resources, Chairman Schapiro has recently testified that she has "allocated additional resources to establish a branch of examiners dedicated specifically to conducting examination oversight of the NRSROs."<sup>121</sup>

### **Recommendation 9:**

The Chairman, in concert with the other Commissioners, shall review the Office of Inspector General's findings on conducting examinations before issuing orders approving applications and, as appropriate and as part of their broader analysis of issues pertaining to Nationally Recognized Statistical Rating Organizations (NRSROs), direct the Office of Compliance Inspections and Examinations and the Division of Trading and Markets, in consultation with the Office of the General Counsel, to seek legislative authority to conduct examinations as part of the NRSRO application process. As part of this review, the Chairman and Commissioner should consider:

- Whether the current 90-day statutory time period should be extended to allow for examinations to be conducted; and
- What additional staffing resources would be required to implement this additional responsibility.

### **Including NRSROs in the Pilot Monitoring Program**

As part of a pilot program, OCIE has assigned staff to monitor the largest broker-dealers, investment advisers and investment companies. The purpose of this pilot program is to improve the examination process by enabling staff to identify

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<sup>120</sup> 2008 Summary Report at 9.

<sup>121</sup> SEC Oversight: Current State and Agenda: Hearing before the H. Comm. on Financial Services, Subcomm. On Capital Markets, Insurance and Government-Sponsored Enterprises, 111<sup>th</sup> Cong. (July 14, 2009) (Testimony of Mary L. Schapiro, Chairman, U.S. Securities and Exchange Commission) ("7/14/09 Schapiro Testimony"), <http://www.sec.gov/news/testimony/2009/ts071409mls.htm>, at 10. See also 7/22/09 Schapiro Testimony at 9.



issues in real time through enhanced communication with the firm and to explore these issues more thoroughly and timely. Real-time identification of issues assists OCIE to identify risks and instances of non-compliance with rules before they materialize or become significant. However, OCIE has not included the NRSROs in the pilot program.<sup>122</sup>

Our review found that given the NRSROs' important role in the financial markets and the criticisms surrounding the quality of their credit ratings, a monitoring program for the NRSROs would enhance the Commission's oversight of the NRSROs. Among other things, this type of program would enable OCIE staff to review complaints received by the NRSROs in real time<sup>123</sup> and to monitor the quality of credit ratings, e.g., by looking into the reasons for credit rating upgrades and downgrades. Finally, OCIE's current examination goal (which varies depending on the NRSRO) is to examine every NRSRO once every two to three years. Given the importance of the NRSROs, it is questionable whether this examination cycle is sufficient.<sup>124</sup> Therefore, we believe that a monitoring program would be a very effective complement to the examination cycle.

#### **Recommendation 10:**

The Office of Compliance Inspections and Examinations (OCIE) should include the Nationally Recognized Statistical Rating Organizations (NRSROs) in its pilot monitoring program. Given the different sizes (i.e., market dominance) of the various NRSROs and the current examination cycle, OCIE should specifically tailor its monitoring program for each particular NRSRO.

#### **Additional Review of OCIE's NRSRO Examination Module**

OCIE is in the process of developing an examination module that contains specific steps to be performed when conducting NRSRO examinations. This module is currently in draft form. According to OCIE, while the module serves as a guide for the NRSRO examination staff, the staff are not supposed to use the module as a checklist.

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<sup>122</sup> As noted above, OCIE has kept open the 2008 examinations of S&P, Moody's and Fitch, and is assessing the NRSROs' implementation of the staff's recommendations before closing the examinations.

<sup>123</sup> 17 C.F.R. § 240.17g-2(b)(8) requires NRSROs to maintain copies of complaints "about the performance of a credit analyst in intimating, determining, maintaining, monitoring, changing, or withdrawing a credit rating."

<sup>124</sup> Because OCIE has not yet examined every NRSRO at least once, it is premature to reach any definitive conclusions about the adequacy of the current examination cycle. As noted above, however, the Administration's legislative proposal would require the Commission to perform reviews of NRSROs' internal controls at least annually, or delegate such reviews to the PCAOB.

OCIE has advised us that it consulted with TM on the adequacy of the draft module, but did not seek any outside expertise. Our review found that having an expert in credit rating and NRSRO matters review the adequacy of the draft module would be another useful quality control to bring a fresh and different perspective to the process and possibly identify missing examination steps or steps that should be enhanced. OCIE stated that an outside review of the draft module conceptually could be useful, but raised concerns about potential conflicts of interest. OCIE also stated that it is interested in hiring staff with recent NRSRO experience with the additional five staff positions it recently received and, as noted above, Chairman Schapiro has recently allocated additional resources to establish a branch of NRSRO examiners. To the extent they have industry experience, these newly-hired staff could review the draft module to suggest possible improvements, consistent with any applicable ethics limitations.

Accordingly, our review found that OCIE could obtain an additional review of its draft examination module either by contracting with an expert or relying on the expertise of newly-hired staff.

**Recommendation 11:**

The Office of Compliance Inspections and Examinations (OCIE), in consultation with the Ethics Office and the Office of Administrative Services, should obtain an additional review of the draft OCIE Nationally Recognized Statistical Rating Organization (NRSRO) examination module by an expert in credit rating and NRSRO matters.

## **Finding 4: The Commission Should Address Several Policy Issues in Order to Improve NRSRO Oversight**

Several policy issues involving NRSROs should be addressed by the Commission. The Commission previously considered some of these issues but took no action.

### **PCAOB Oversight of NRSRO Auditors**

Section 15E(a)(2)(C) of the Exchange Act provides that if a CRA complies with the statutory application requirements, the Commission must approve the application unless:

the applicant does not have adequate financial and managerial resources to consistently produce credit ratings with integrity and to materially comply with the procedures and methodologies disclosed . . . .<sup>125</sup> [Emphasis added.]

The Commission requires a CRA seeking designation as an NRSRO to provide, (in Exhibit 11 of Form NRSRO, audited financial statements in order enable the Commission to assess the CRA's financial resources.<sup>126</sup> In addition, CRAs are required to provide this information annually after becoming NRSROs.<sup>127</sup>

Despite the importance of the financial statement information being provided, the Commission does not require that the financial statements be audited by a firm that is subject to oversight by the PCAOB.<sup>128</sup> Instead, the auditor is required to comply with various Commission accountant qualification requirements specified in Rule 2-01 of Regulation S-X.<sup>129</sup> TM stated that the Sarbanes-Oxley Act would need to be amended in order for the Commission to require that a firm's auditor be subject to PCAOB oversight.

The Sarbanes-Oxley Act established a comprehensive program for the oversight of the auditors of public companies through the establishment of the PCAOB. This oversight program includes a registration requirement, a continuing program of inspections, and the establishment of auditing and related attestation, quality control, ethics and independence standards to be used by registered firms.<sup>130</sup> In

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<sup>125</sup> 15 U.S.C. § 78o-7(a)(2)(C)(ii)(I).

<sup>126</sup> The instructions to Form NRSRO allow an applicant that does not have audited financial statements for one or more of the three fiscal or calendar years immediately preceding the date of the initial application to the Commission to provide unaudited financial statements for the applicable year or years. However, the applicant must provide audited financial statements for the fiscal or calendar year ending immediately before the date of the initial application, and the unaudited financial statements must be accompanied by a certification by an authorized person that the financial statements fairly present, in all material respects, the applicant's financial condition, results of operations, and cash flows for the period presented.

<sup>127</sup> 17 C.F.R. § 240.17g-3(a).

<sup>128</sup> The Sarbanes-Oxley Act, which was enacted in July 2002 in response to numerous financial-related scandals involving public companies (e.g., Enron and WorldCom) and their auditors (e.g., Arthur Andersen), established the PCAOB as a nonprofit corporation. The PCAOB's statutory mission is to "protect the interests of investors and further the public interest in the preparation of informative, accurate, and independent audit reports for companies the securities of which are sold to, and held by and for, public investors." Section 101(a) of the Sarbanes-Oxley Act, 15 U.S.C. § 7211. Section 102(a) of the Sarbanes-Oxley Act requires that accounting firms be registered with the PCAOB, if they "prepare or issue, or . . . participate in the preparation or issuance of, any audit report with respect to any issuer [as defined in Section 3 of the Exchange Act]." 15 U.S.C. § 7212(a).

<sup>129</sup> 17 C.F.R. § 240.17g-3(a)(1)(iii).

<sup>130</sup> See <http://www.pcaobus.org> for additional information on the PCAOB's oversight of public accounting firms.

contrast, Rule 2-01 of Regulation S-X is limited in scope and “is designed to ensure that auditors are qualified and independent of their audit clients both in fact and in appearance.”<sup>131</sup> The Rule lists a number of factors as “generally guidance only” and provides that the Commission will consider all relevant facts and circumstances in determining whether an accountant is independent.<sup>132</sup>

During our review, we learned of the following examples of significant problems identified by Commission staff with the audited financial statement information provided by NRSROs, which are particularly noteworthy because none of the NRSROs in these examples used auditing firms that were subject to PCAOB oversight:

- An OCIE examination into information provided by a tip found that an NRSRO (LACE), during its application process, appeared to have intentionally understated the amount of revenue it received from its largest client.<sup>133</sup> The OCIE examination also found that the firm provided the Commission with audited financial statements that appeared to understate its revenue in contravention of GAAP.<sup>134</sup> According to OCIE, however, the NRSRO may have misled its independent auditor regarding information pertinent to the amount of revenue the NRSRO received from its largest client.<sup>135</sup> OCIE has recently referred the issues described above to the Division of Enforcement,<sup>136</sup> which has commenced an informal investigation and is reviewing the auditor’s role as part of that investigation.
- TM had suspicions regarding the accuracy of the financial information a CRA (EJR) provided in its application for registration as an NRSRO, as noted above.

In light of these examples and TM’s reliance on a CRA’s financial statements to assess its financial resources in connection with its application for NRSRO registration and thereafter, our review found that requiring the CRA’s auditor to

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<sup>131</sup> 17 C.F.R. § 210.2-01.

<sup>132</sup> *Id.*

<sup>133</sup> OCIE Examination Report Concerning LACE’s Operation as an NRSRO (June 12, 2009) (“LACE Examination Report”) at 2, 4. Commission Rule 17g-5(c)(1) prohibits an NRSRO from issuing or maintaining a credit rating solicited by a person that, in the most recent fiscal year, provided the NRSRO with net revenue equal to or exceeding ten percent of the NRSRO’s total net review for the fiscal year. 17 C.F.R. § 240.17g-5(c)(1).

<sup>134</sup> LACE Examination Report at 4.

<sup>135</sup> *Id.* at 36.

<sup>136</sup> Enforcement Referral of LACE, a credit rating agency registered as an NRSRO (June 12, 2009).

register with the PCAOB and be subject to its comprehensive program of oversight would be in the public interest.

#### **Recommendation 12:**

The Chairman, in concert with the other Commissioners, shall review the Office of Inspector General's findings concerning PCAOB oversight of NRSRO auditors, and as appropriate and as part of their broader analysis of issues pertaining to Nationally Recognized Statistical Rating Organizations (NRSROs), direct the Division of Trading and Markets (TM), in consultation with the Office of the Chief Accountant, the Office of Risk Assessment and the Office of the General Counsel, to seek legislative authority to provide the Public Company Accounting Oversight Board (PCAOB) with oversight over audits of NRSROs. If that authority is obtained, TM should recommend rules that require NRSROs and credit rating agencies seeking to become NRSROs to use auditors that are overseen by the PCAOB.

#### **Consulting and Advisory Services**

Most NRSROs perform consulting and advisory services in addition to issuing credit ratings. Providing such services to an entity as to which the NRSRO has issued a credit rating may create a conflict of interest.<sup>137</sup>

Section 15E(h)(2) of the Exchange Act provides that the Commission should prohibit or require NRSROs to disclose and manage conflicts of interest relating to an NRSRO's provision of consulting, advisory, or other services to the obligor or any affiliate of the obligor.<sup>138</sup> Under Commission Rule 17g-5(b)(3), which was adopted in June 2007, a person within an NRSRO is prohibited from having a conflict of interest as a result of "being paid for services in addition to determining credit ratings by issuers, underwriters, or obligors that have paid the [NRSRO] to determine a credit rating," unless the NRSRO has disclosed the conflict and has established and is managing and enforcing written policies and procedures to address and manage the conflict.<sup>139</sup> The Commission stated that it did not receive any comments on the proposal for this provision and adopted the requirement as substantially proposed.<sup>140</sup>

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<sup>137</sup> Similar conflicts of interest existed in accounting profession until Section 201 of the Sarbanes-Oxley Act, 15 U.S.C. § 78j-1(a)(g), was enacted in 2002.

<sup>138</sup> 15 U.S.C. § 78o-7(h)(2),

<sup>139</sup> 17 C.F.R. § 240.17g-5(b)(3).

<sup>140</sup> Exchange Act Release No. 34-55857 at 138.

On February 2, 2009, the Commission issued a release that added a new paragraph to Rule 17g-5 that prohibited an NRSRO from performing a narrow category of consulting services, as follows:

Under this paragraph, an NRSRO is prohibited from issuing or maintaining a credit rating with respect to an obligor or security where the NRSRO or a person associated with the NRSRO made recommendations to the obligor or the issuer, underwriter, or sponsor of the security about the corporate or legal structure, assets, liabilities, or activities of the obligor or issuer of the security. The purpose of this rule is to address the potential lack of impartiality that could arise when an NRSRO determines a credit rating based on a corporate structure that was developed after consultations with the NRSRO or its affiliate on how to achieve a desired credit rating. In simple terms, the rule prohibits an NRSRO from rating its own work or the work of an affiliate.<sup>141</sup> [Emphasis added.]

This rule amendment, however, does not prohibit an NRSRO from providing other types of consulting and advisory work for the issuer being rated. We noted that IOSCO's Code of Conduct addresses the possible conflicts of interest created by CRA consulting businesses as follows:

A CRA should separate, operationally and legally, its credit rating business and CRA analysts from any other businesses of the CRA, including consulting businesses, that may present a conflict of interest. A CRA should ensure that ancillary business operations which do not necessarily present conflicts of interest with the CRA's rating business have in place procedures and mechanisms designed to minimize the likelihood that conflicts of interest would arise. A CRA should also define what it considers, and does not consider, to be an ancillary business and why.<sup>142</sup> [Red-line markings omitted.]

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<sup>141</sup> Exchange Act Release No. 34-59342 at 38-39. See 17 C.F.R. § 17g-5(c)(5).

<sup>142</sup> The Technical Committee of the International Organization of Securities Commissions, Code of Conduct Fundamentals for Credit Rating Agencies, (Revised May 2008), <http://www.fsa.go.jp/inter/ios/20080609-1/04.pdf>, at 7-8, Code of Conduct Section 2.5. According to an IOSCO report, all but two of the NRSROs (EJR and Lace) have partially, substantially or fully adopted IOSCO's CRA Code. Technical Committee of the International Organization of Securities Commissions, A Review of Implementation of the IOSCO Code of Conduct Fundamentals for Credit Rating Agencies (Mar. 2009). The EU's regulation does not prohibit CRAs from performing ancillary activities for the issuers for which they perform credit rating services, but recognizes that "[t]he performance of ancillary activities should not compromise the independence or integrity of their credit rating activities." EU Regulation at 5, Preamble, Point (2d).

In addition, some of the larger NRSROs have recognized the need to segregate non-rating consulting services from their ratings business.<sup>143</sup> The Obama Administration's recent legislative proposal would strengthen credit rating independence by barring CRAs from consulting with any company they also rate, although the Commission would have authority to grant exemptions from this prohibition on a case-by-case basis.<sup>144</sup>

Our review found that the potential conflicts of interest created by NRSROs performing other types of consulting and advisory work for issuers could have a significant negative effect on the quality of credit ratings. For example, during its 2002 NRSRO examinations, OCIE found the following issues:

- "Individuals at S&P with responsibility for Enron's rating may have been influenced by S&P's business relationship with Enron. The Staff reviewed emails from S&P in which an S&P ratings employee discussed proposals for generating additional revenue from Enron through potential business alliances and in which an S&P ratings employee commented that if Enron filed for bankruptcy, S&P would lose \$1 million dollars in revenue."<sup>145</sup> [Emphasis added.]
- "At this time, the rating services divisions of each of the NRSROs account for a large majority of NRSRO revenue. However, each NRSRO is diversifying its activities and expanding its services. Such new services include the rating assessment services addressed above as well as other informational services paid through subscriptions. In addition, S&P recently purchased the Corporate Value Consulting division of PricewaterhouseCoopers to provide tax and valuation consulting services. Although this division is subject to firewalls from S&P's rating services, including being located in a different building, it is generating over seven percent of S&P's U.S. revenues after being acquired just last year.

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<sup>143</sup> A Moody's official has represented that Moody's "recently reorganized its operating businesses to formalize the separation of [its] ratings-related and non-rating activities into two different business units." Turmoil in U.S. Credit Markets: The Role of the Credit Rating Agencies: Hearing before the S. Comm. on Banking, Housing and Urban Affairs, 110th Cong. (April 22, 2008) (Testimony of Claire Robinson, Senior Managing Director, Moody's Investor Service) at 10. Similarly, S&P has stated, "... S&P's credit ratings business does not provide consulting services to the issuers [S&P] rates. We do not advise issuers about how to conduct their business, whether to seek financing, or how and when to approach the capital markets. Additionally, our ratings analysts are strictly segregated from other S&P activities and those of our parent company, The McGraw-Hill Companies, Inc." Credit Rating Agencies and the Financial Crisis: Hearing before the H. Comm. on Oversight and Governmental Reform, 110th Cong. (October 22, 2008) (Testimony of Deven Sharma, President, Standard & Poor's), <http://oversight.house.gov/documents/20081022125052.pdf>, at 13.

<sup>144</sup> Treasury Fact Sheet at 1; Administration Legislative Proposal, § 933. [http://www.financialstability.gov/docs/regulatoryreform/titleX\\_subtC.pdf](http://www.financialstability.gov/docs/regulatoryreform/titleX_subtC.pdf)

<sup>145</sup> Information Memorandum to the Commission from OCIE, subject: Report Concerning Examinations of NRSROs: Moody's, Standard & Poor's and Fitch (Nov. 10, 2002) ("OCIE 2002 Examination Report"), at 2.

To the extent that these other services begin to generate substantial revenue from issuers, the potential conflict increases between the need to please the issuers paying for those services and the need to provide independent, objective ratings of those same issuers. If a large portion of that revenue comes from a small number of few issuers, the concern about that potential conflict will heighten even further. The potential for this conflict is akin to the auditor independence issue relating to auditors offering corporate consulting services to their auditing clients.”<sup>146</sup> [Emphasis added.] [Footnote omitted.]

In addition, the Commission’s 2003 Concept Release raised concerns about NRSROs performing consulting and advisory work for the entities they rate.<sup>147</sup> Specifically, the 2003 Concept Release stated as follows:

Some also believe that conflicts of interest can arise when credit rating agencies offer consulting or other advisory services to the entities they rate. The NRSROs generally represent that they have established extensive guidelines to manage conflicts in this area, including firewalls to separate their ratings services from other ancillary businesses. They also indicate that advisory services presently represent a very small portion of their total revenues. Commenters have also expressed concern that conflicts in this area could become much greater if these ancillary services were to become a substantial portion of an NRSRO’s business, and suggestions were made that their percentage contribution to the total revenues of an NRSRO be capped. Others were concerned that issuers could be unduly pressured to purchase advisory services, particularly in cases where they were solicited by a rating analyst at an NRSRO.<sup>148</sup> [Emphasis added.]

Based on our review of each NRSRO’s most recent financial report on sources of revenue, we found that, contrary to the statement in the 2003 Concept Release, services other than credit ratings, including consulting and advisory services, are a significant revenue source for some NRSROs, either in terms of the total

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<sup>146</sup> Id. at 26. OCIE recognized that “[t]his conflict may be mitigated by the fact that some of the users of non-rating services may not issue debt instruments and therefore, may not need be rated by the NRSROs.” Id. at 26 n.1.

<sup>147</sup> Securities Act Release No. 33-8236 at 10-11.

<sup>148</sup> Id.



revenue generated and/or as a percentage of total revenues.<sup>149</sup> Table 1 below contains an analysis of revenues reported by the ten existing NRSROs.<sup>150</sup>

**Table 1: Comparison of NRSRO Revenue from Other Services and Products vs. Total Revenue**

<b>NRSRO</b>	<b>REVENUE FROM OTHER SERVICES AND PRODUCTS</b>	<b>TOTAL REVENUE</b>	<b>PERCENTAGE OF TOTAL REVENUE</b>
A.M. Best	\$32.9 million	\$96.3 million	34.16%
DBRS	\$7.2 million	\$55 million	13.09%
EJR	\$.5 million	\$2.6 million	19.23%
Fitch	\$31 million	\$702 million	4.42%
JCR	\$0	\$18.2 million	0.00%
LACE	\$5,000	\$1.038 million	.48%
Moody's	\$0	\$1,269 million	0.00%
Realpoint	\$4.1 million	\$10.4 million	39.42%
R&I	\$5.8 million	\$46.3 million	12.53%
S&P	\$119 million	\$1,640 million	7.26%

Source: Data provided by TM based on the most recent NRSRO Annual Financial Reports.

Moreover, several CRAs (e.g., A.M. Best, JCR and R&I) disclosed in their NRSRO applications (Exhibit 6 to Form NRSRO) that they were paid for services in addition to determining credit ratings by issues, underwriters, or obligors that had paid the CRA for a credit rating.

Accordingly, our review found that further restrictions on these other types of services may be in the public interest. Specifically, our review found that revenue from services other than credit ratings, including consulting and advisory

<sup>149</sup> It should be noted at the time the 2003 Concept Release was published, there were only four NRSROs (Moody's, S&P, Fitch and DBRS.)

<sup>150</sup> The amounts in this table were obtained from TM based upon the NRSROs' most recent annual financial reports, which are furnished to the Commission on a confidential basis under Section 15E(k) of the Exchange Act. The Commission's rules require that the NRSROs furnish this information within 90 calendar days after the end of the firm's fiscal year, see 17 C.F.R. § 240.17g-3(a)(3). The revenue from other services and products amount for one NRSRO (EJR) was based upon a percentage estimate provided by the firm as it did not give dollar amounts for revenue detail. In addition, the revenue amounts for three NRSROs (R&I, JCR and DBRS) were converted from foreign currency.

services, can be significant for some NRSROs. To the extent these services are performed for issuers, underwriters or obligors that pay the NRSROs for credit ratings, the quality of credit ratings could be adversely affected. We are recommending, therefore, that OCIE perform examination work to determine whether the quality of credit ratings is being adversely affected by NRSROs performing consulting and advisory services for issuers, underwriters or obligors that have paid the NRSROs for credit ratings, and that TM analyze this issue. If warranted by the results of OCIE's examination work and TM's analysis, TM should recommend that the Commission propose appropriate rules designed to prevent an NRSRO's consulting and advisory services from potentially adversely affecting the quality of credit ratings. As necessary, the Commission could exempt smaller NRSROs from any restrictions on providing such services in order to promote competition in among NRSROs.

**Recommendation 13:**

The Office of Compliance Inspections and Examinations should perform examination work to determine whether the quality of credit ratings is being adversely affected by Nationally Recognized Statistical Rating Organizations (NRSROs) performing consulting and advisory services for issuers, underwriters or obligors that have paid the NRSROs for credit ratings.

**Recommendation 14:**

The Division of Trading and Markets (TM), in consultation with the Office of Compliance Inspections and Examinations (OCIE), the Office of Economic Analysis, the Office of International Affairs, and the Office of Risk Assessment, should assess the impact of the provision of consulting and advisory services on the quality of credit ratings and how best to minimize the potential harmful effects, without unduly limiting competition among the Nationally Recognized Statistical Rating Organizations (NRSROs). If warranted by the results of OCIE's examination work and TM's analysis, TM should recommend that the Commission propose appropriate rules designed to prevent an NRSRO's consulting and advisory services from potentially adversely affecting the quality of credit ratings.

**Monitoring of Credit Ratings**

After an NRSRO issues a credit rating, it typically monitors (i.e., conducts surveillance of) the credit rating, although it is not required to do so. The purpose of this monitoring is to determine whether the credit rating needs to be changed based on new information. The monitoring process, including the amount of resources devoted to it, varies among the NRSROs.

In 2002, the Senate staff's report on Enron's bankruptcy raised questions about the NRSROs' credit rating monitoring process because the three major NRSROs did not lower their credit ratings of Enron to below investment grade until four days prior to its bankruptcy filing.<sup>151</sup> In 2005, when the Commission proposed a rule to define the term NRSRO, the former Director of TM stated at the open Commission meeting on the proposed rule as follows:

The proposed definition also requires that credit ratings are kept current – meaning that such ratings are actively monitored on a continuous basis. Some credit rating agencies that review and update their credit ratings only on a periodic basis have sought NRSRO no-action relief. The staff believes that credit ratings used for regulatory purposes should be actively monitored on a continuous basis and confirmed, upgraded, or downgraded, if and when necessary.<sup>152</sup> [Emphasis added.]

The Commission's proposed rule defining the term "NRSRO" included a requirement that, in order to qualify as an NRSRO, the CRA's credit ratings must be "current," i.e., that they "are actively monitored and updated appropriately on a continuous basis . . . ."<sup>153</sup> Notwithstanding the recognized importance of monitoring credit ratings, the Commission did not propose mandating how frequently NRSROs needed to monitor their credit ratings, e.g., monthly, quarterly, or annually.<sup>154</sup> In the proposed rule release, the Commission concluded as follows:

Specifying a time period within which a credit rating agency must update or affirm a rating might be problematic because the appropriate time period for responding to a material event may vary considerably based on, for example, the complexity of an issuer or the specific security being rated. Accordingly, it may be appropriate

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<sup>151</sup> Senate Staff Report at 97. Office of International Affairs (OIA) staff pointed out that the existence of rating triggers in many of Enron's debt agreements contributed to the timing of Enron's decision to declare bankruptcy shortly after the major NRSROs downgraded its debt below investment grade. Accordingly, the degree of the downgrade, rather than its timing, may be of more importance.

<sup>152</sup> Annette Nazareth, Director, Division of Market Regulation, Securities and Exchange Comm'n, NRSRO Proposal Opening Statement at March 3, 2005 Commission Meeting (Mar. 4, 2005), <http://www.sec.gov/news/speech/spch030305aln.htm>, at 2.

<sup>153</sup> Proposed Rule: Definition of Nationally Recognized Statistical Rating Organization, Securities Act Release No. 33-9570 (Apr. 19, 2005), <http://www.sec.gov/rules/proposed/33-8570.pdf>, at 26.

<sup>154</sup> The EU's regulation provides that a "credit rating agency shall monitor credit ratings and review its credit ratings and methodologies on an ongoing basis and at least annually, in particular where material changes occur that could have an impact on a credit rating. A credit rating agency shall establish internal arrangements to monitor the impact of changes in macroeconomic or financial market conditions on credit ratings." EU Regulation at 24, Article 7, Point 4 (emphasis omitted).

for a credit rating agency to have the flexibility to respond to material events relating to its ratings on a case-by-case basis. This approach responds to comments that the Commission should not set detailed standards as to when a rating agency should update its ratings.<sup>155</sup>

Moreover, the Commission never acted on the 2005 proposed rule that would have required active monitoring of credit ratings on a continuous basis.<sup>156</sup>

Further, the SEC's 2008 NRSRO examinations found that the surveillance processes used by S&P, Moody's, and Fitch appear to have been less robust than the processes used for their initial ratings.<sup>157</sup> Specifically, SEC staff identified several problems with these NRSROs' surveillance efforts, as follows:

- The adverse impact of the amount of resources devoted to surveillance of credit ratings on the timeliness of surveillance efforts;
- Poor documentation of the surveillance performed; and
- The lack of written surveillance procedures.<sup>158</sup>

Accordingly, our review found that a specific credit rating monitoring requirement, including the upgrading or downgrading of ratings as appropriate, could improve the quality of credit ratings and, therefore, would be in the public interest.

#### **Recommendation 15:**

The Chairman, in concert with the other Commissioners, shall review the Office of Inspector General's findings on monitoring of credit ratings and, as appropriate and as part of their broader analysis of issues pertaining to Nationally Recognized Statistical Rating Organizations (NRSROs), direct the Division of Trading and Markets (TM), in consultation with the Office of Compliance

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<sup>155</sup> Id. at 27.

<sup>156</sup> On February 2, 2009, the Commission adopted rule amendments that required NRSROs to disclose the frequency of their surveillance efforts and how changes to their quantitative and qualitative ratings models are incorporated into the surveillance process. Amendments to Rules for Nationally Recognized Statistical Rating Organizations, Exchange Act Release No. 34-59342 (Feb. 2, 2009) at 15. Proposed legislation would require NRSROs to "notify users of credit ratings when a change is made to a procedure or methodology, including to a qualitative or quantitative model, or an error is identified in a procedure or methodology that may result in credit rating actions, and the likelihood of the change resulting in current credit ratings being subject to rating actions." S. 1073, 111<sup>th</sup> Cong. § 3 (2009). See also Administration Legislative Proposal § 932.

<sup>157</sup> 2008 Summary Report at 21.

<sup>158</sup> Id. at 21-22.

Inspections and Examinations, the Office of Economic Analysis, the Office of International Affairs (OIA), the Office of Risk Assessment, and the Office of the General Counsel, to recommend appropriate rules to implement a comprehensive credit rating monitoring requirement for Nationally Recognized Statistical Rating Organizations (NRSROs). TM should also meet with OIA periodically (e.g., quarterly) to discuss the effects that any foreign laws or rules regarding credit rating monitoring are having, or may have, on the NRSROs.

### **Credit Rating Analyst Rotation**

The larger NRSROs use a rating committee process under certain circumstances, including to rate a new issuer or instrument, assess a major transaction or event that might impact a current rating, or to consider reviewing a rating for change.<sup>159</sup> The lead credit rating analyst frames the issues and presents most of the data under consideration, although the opinions of all members are considered and vetted resulting in a non-public memorandum discussing the committee's decision, rationale, assumptions and underlying data.<sup>160</sup>

Our review found that concerns exist as to whether credit rating analysts are or could be subject to undue influence (i.e., pressure to rate a security higher than it should be rated). As part of reforms designed to enhance the integrity of the ratings process and to safeguard against factors that could challenge that process, S&P agreed to implement periodic rotations for lead analysts to "help prevent long-standing professional or personnel relationships from affecting ratings."<sup>161</sup> These changes are consistent with the EU's regulation on CRAs, which states as follows:

Long lasting relationships with the same rated entities or its related third parties could compromise the independence of analysts and persons approving credit ratings. Therefore those analysts and persons should be subject to an appropriate rotation mechanism which should provide for a gradual change in analytical teams and credit rating committees.<sup>162</sup> [Emphasis omitted.]

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<sup>159</sup> 2003 Sarbanes-Oxley Act Report at 26. Our review of the NRSROs' filings with the Commission indicated that all but one (LACE) employ a rating committee process.

<sup>160</sup> Id.

<sup>161</sup> Turmoil in U.S. Credit Markets: The Role of the Credit Rating Agencies: Hearing before the S. Comm. on Banking, Housing and Urban Affairs, 110th Cong. (April 22, 2008) (testimony of Vickie A. Tillman, Executive Vice President, Standard & Poor's Credit Rating Services), at 3.

<sup>162</sup> EU Regulation at 9, Preamble, Point (13). The EU's regulation does provide that competent authorities should be able to exempt CRAs employing fewer than 50 employees from certain of the rules' requirements, including the rotation mechanism. Id. at 9, Preamble, Point (12a).

The EU's regulation also requires an annual transparency report that includes "a description of the management and analyst rotation policy."<sup>163</sup>

During our review, we also examined concerns that had arisen with respect to other gatekeepers in the securities industry and how those concerns had been addressed. We discovered that when faced with a concern about undue influence in the accounting profession, legislation was enacted in Section 203 of the Sarbanes-Oxley Act, as follows:

It shall be unlawful for a registered public accounting firm to provide audit services to an issuer if the lead (or coordinating) audit partner (having primary responsibility for the audit), or the audit partner responsible for reviewing the audit, has performed audit services for that issuer in each of the 5 previous fiscal years of that issuer.<sup>164</sup>

In its rule implementing Section 203 of the Sarbanes-Oxley Act, the Commission required that the lead partner and concurring partner "rotate after five years and, upon rotation, be subject to a five-year 'time out' period."<sup>165</sup> The Commission explained in its rule release that "[b]ecause of the importance of achieving a fresh look to the independence of the audit function," it believed "that a five-year time-out period is appropriate for these two partners."<sup>166</sup>

Our review found, therefore, that given the similar potential for undue influence in the CRA industry, a credit rating analyst rotation requirement could likewise bring a "fresh look" to the independence of the credit rating process and reduce the likelihood of undue pressure on credit rating analysts and, at the same time, improve the quality of credit ratings.

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<sup>163</sup> *Id.* at 51. OIA pointed out several reasons why the EU's regulation may not be an appropriate model to follow with respect to analyst rotation. For example, it has been suggested that analyst rotation could undermine the independence of lead analysts, who otherwise may have developed a level of industry expertise that would make them less reliant on information provided by issuers. Likewise, legislative proposals mandating analyst rotation may conflate the roles of CRAs, which might be described as "forward-focused," using their own methodologies to predict future probabilities, and independent auditors, which might be described as "backwards-focused," using formalized auditing standards to confirm the accuracy of statements regarding historic facts.

<sup>164</sup> 15 U.S.C. § 78j-1(j).

<sup>165</sup> Final Rule: Strengthening the Commission's Requirements Regarding Auditor Independence, Securities Act Release No. 33-9193 (Jan. 28, 2003), <http://www.sec.gov/rules/final/33-8183.htm>, at 24.

<sup>166</sup> *Id.* It should be noted that the Sarbanes-Oxley Act and related SEC rules require rotation of audit partners, but not rotation of audit teams. It has been suggested that lead analysts at NRSROs are more like members of an audit team than they are like lead auditors.

**Recommendation 16:**

The Office of Compliance Inspections and Examinations should perform examination work into whether, and under what circumstances, credit rating analysts face undue influence and the effects of such undue influence on the credit ratings issued by Nationally Recognized Statistical Rating Organizations.

**Recommendation 17:**

The Division of Trading and Markets (TM), in consultation with the Office of Compliance Inspections and Examinations (OCIE), the Office of International Affairs (OIA), and the Office of Risk Assessment, should assess the effects of undue influence on the quality of credit ratings and the potential benefits of a credit analyst rotation requirement. Depending on the results of OCIE's examination work and TM's analysis, TM should recommend rules to address the risk of undue influence. TM should also meet with OIA periodically (e.g., quarterly) to discuss the effects that any foreign laws or rules on credit rating analyst rotation are having, or may have, on the Nationally Recognized Statistical Rating Organizations. If necessary, the Commission should seek legislative authority to implement the proposed rules designed to address the risk of undue influence.

**Credit Ratings Disclosures**

Concerns have previously been identified with NRSROs generally not sufficiently probing information provided by issuers. For example, the Senate staff's report on Enron's bankruptcy criticized the NRSROs for relying too extensively on information provided by Enron.<sup>167</sup> According to the report, it appeared "that the credit raters took Enron at their word and failed to probe more deeply."<sup>168</sup> Moreover, if the issuer is paying for the credit rating, an NRSRO might have an incentive to take the issuer's statements at face value in order to obtain further business from the issuer.

On February 2, 2009, the Commission issued a release adopting amendments (to the instructions of Exhibit 2 of Form NRSRO) to require disclosure regarding the amount of due diligence performed in determining credit ratings. Specifically, the release stated as follows:

The Commission also is amending the instructions to Exhibit 2 to Form NRSRO to require enhanced disclosures about the procedures and methodologies an NRSRO uses to determine credit

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<sup>167</sup> Senate Staff Report at 115-122.

<sup>168</sup> Id. at 115-16.

ratings, including whether and, if so, how information about verification performed on assets underlying a structured finance transaction is relied on in determining credit ratings; whether and, if so, how assessment of the quality of originators of assets underlying a structured finance transaction factor into the determination of credit ratings; and how frequently credit ratings are reviewed, whether different models are used for ratings surveillance than for determining credit ratings, and whether changes made to models and criteria for determining initial ratings are applied retroactively to existing ratings.<sup>169</sup>

However, only one of the three additional disclosure requirements (pertaining to the disclosures regarding surveillance efforts) applies to securities other than structured products despite the events surrounding Enron's bankruptcy (which affected the timely repayment of principal and interest on Enron's corporate bonds). Further, the rule does not require that NRSROs disclose any significant limitations and assumptions surrounding the credit rating or the data used in developing the credit rating. The Commission previously considered requiring such disclosures, as the Commission's 2003 Concept Release asked about these types of issues as follows:

**Question 50:** Specifically, should NRSRO recognition be conditioned on a rating agency disclosing the key bases of, and assumptions underlying its rating decisions? If so, should these disclosures be made pursuant to standards developed by the industry, or otherwise?

\* \* \*

**Question 52:** Should NRSRO recognition be conditioned on a rating agency's disclosing whether or not an issuer participated in the rating process? Or, could issuers be required to make such disclosures?<sup>170</sup>

Some of the public comment letters supported enhanced credit rating disclosures, while other comment letters did not.<sup>171</sup>

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<sup>169</sup> Exchange Act Release 34-59342 at 77-78. In addition, as part of the settlement with the NYAG, S&P, Moody's and Fitch agreed to the following reform: "Credit rating agencies will develop criteria for the due diligence information that is collected by investment banks on the mortgages comprising an RMBS. The credit rating agencies will receive loan level results of due diligence and review those results prior to issuing ratings. The credit rating agencies will also disclose their due diligence criteria on their websites." NYAG Press Release at 1.

<sup>170</sup> Securities Act Release No. 33-8236 at 15.

<sup>171</sup> See comments posted at <http://www.sec.gov/rules/concept/s71203.shtml>.



The RATE Act would, among other things, require the Commission to establish a form for NRSROs to make numerous disclosures including the main assumptions used in credit rating procedures and methodologies, the potential shortcomings of the credit ratings, the use of third party due diligence services, an explanation or measure of the potential volatility for the rating, etc.<sup>172</sup> Further, Chairman Schapiro described the following area as one in which positional reform is needed:

Requiring more disclosure from credit rating agencies, including potentially the assumptions underlying their methodologies, fees received from issuers, and factors that could change ratings.<sup>173</sup>

Lastly, a recent report issued by the Department of the Treasury on financial regulatory reform stated as follows:

Credit rating agencies should also publicly disclose, in a manner comprehensible to the investing public, precisely what risks their credit ratings are designed to assess (for example, likelihood of default and/or loss severity in event of default), as well as material risks not reflected in the ratings. Such disclosure should highlight how the risks of structured products, which rely on diversification across a large number of individual loans to protect the more senior investors, differ fundamentally from the risks of unstructured corporate debt.

Credit rating agencies should disclose sufficient information about their methodologies for rating structured finance products, including qualitative reviews of originators, to allow users of credit ratings and market observers to reach their own conclusions about the efficacy of the methodologies. Credit rating agencies should also disclose to the SEC any unpublished rating agency data and methodologies.<sup>174</sup>

Accordingly, our review found that enhanced credit rating disclosures would better enable investors to make well-informed investment decisions and would be in the public interest.

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<sup>172</sup> S. 1073, 111<sup>th</sup> Cong. § 3 (2009).

<sup>173</sup> Mary Schapiro, Chairman, Securities Exchange Commission, Address to the Council of Institutional Investors (Apr. 6, 2009), <http://www.sec.gov/news/speech/2009/spch040609mls.htm>, at 5.

<sup>174</sup> Treasury Report at 46. Under the Administration's recent legislative proposal, CRAs would "be required to provide a much fuller picture of the risks in any rated security through the addition of qualitative and quantitative disclosure of the risks and performance variance inherent in any given security." Treasury Fact Sheet at 2; see also Administration Legislative Proposal, § 932.

### **Recommendation 18:**

The Chairman, in concert with the other Commissioners, shall review the Office of Inspector General's findings on credit ratings disclosures and, as appropriate and as part of their broader analysis of issues pertaining to Nationally Recognized Statistical Rating Organizations (NRSROs), direct the Division of Trading and Markets, in consultation with the Office of Compliance Inspections and Examination, the Office of Economic Analysis, and the Office of Risk Assessment, to recommend additional rule amendments to enhance the disclosures surrounding the credit ratings process, including, for example, the key assumptions used in credit ratings methodologies and procedures, and any shortcomings of or limitations on credit ratings.

### **Revolving Door**

Concerns have been expressed about a "revolving door" problem created by credit rating analysts leaving to work for issuers as to which the credit rating analyst has provided credit ratings. Such a revolving door could adversely affect the quality of credit ratings because the objectivity of the credit rating analyst could be impaired. One commentator explained the cause of the revolving door problem, as follows:

Given the lower compensation levels of NRSRO analysts relative to their counterparts at investment banks and other issuers, there is a real risk that analysts, seeking to elicit future offers or employment, would compromise their objectivity or ratings quality in an effort to curry favor from those firms whose products they have been called to rate. The numerous examples of NRSRO analysts leaving an NRSRO firm whose securities the analyst had been engaged to rate begs attention and reflection.<sup>175</sup>

The Sarbanes-Oxley Act previously addressed a similar revolving door problem in the accounting profession. Specifically, Section 206 of the Sarbanes-Oxley Act prohibits a registered public accounting firm from performing any required audit service for an issuer "if a chief executive officer, controller, chief financial officer, chief accounting officer, or any person serving in an equivalent position for the issuer, was employed by that registered independent public accounting firm and participated in any capacity in the audit of that issuer during the 1-year period preceding the date of the initiation of the audit."<sup>176</sup>

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<sup>175</sup> Joshua Rosner, Toward an Understanding: NRSRO Failings in Structured Ratings and Discreet Recommendations to Address Agency Conflicts, The Journal of Structured Science (Winter 2009).

<sup>176</sup> 15 U.S.C. § 78j-1(l).

The Commission's rules concerning NRSROs do not address the revolving door issue in any manner. In contrast, IOSCO has recommended that "[a] CRA should establish policies and procedures for reviewing the past work of analysts that leave the employ of the CRA and join an issuer that the analyst has rated, or a financial firm with which an analyst has had significant dealings as an employee of the CRA."<sup>177</sup> Further, the EU's regulation states as follows:

Where a rating analyst terminates his or her employment and joins a rated entity, in the credit rating of which the analyst has been involved, or a financial firm, with which the rating analyst has had dealings as part of his or her duties at the credit rating agency, a credit rating agency shall review the relevant work of [the] analyst over 2 years preceding his departure.<sup>178</sup> [Emphasis omitted.]

In addition, at a hearing held on the recent financial crisis, an S&P official testified that S&P was "[i]mplementing 'look back' reviews when analysts leave to work for an issuer" in order to "safeguard against undue influence by issuers in the ratings process."<sup>179</sup> Similarly, a Moody's official testified that it had adopted a new policy requiring a six-month "look-back" review of the work of a lead credit analyst who leaves Moody's to work for an issuer or a financial intermediary representing the issuer "to confirm the integrity and rigor of that analyst's work."<sup>180</sup> Lastly, both the RATE Act and the Administration's legislative proposal would require look-back reviews when an employee of an obligor, or an issuer or underwriter of a security or money market instrument was employed by a credit rating agency and participated in any capacity in determining credit ratings for the obligor or the securities or money market instruments of the issuer during the one-year period preceding the date of the issuance of the credit rating.<sup>181</sup>

During our review, OCIE staff informed us that the Commission's 2008 NRSRO examinations of S&P, Moody's and Fitch did not specifically attempt to review the

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<sup>177</sup> IOSCO Report at 15, Recommendation 9.

<sup>178</sup> EU Regulation at 47, Annex I, Section C.6. The EU's regulation also states that rating analysts and other persons directly involved in credit rating activities "shall not take up a key management position with the rated entity or its related third party before 6 months have lapsed since the credit rating." *Id.*, Section C.7.

<sup>179</sup> Turmoil in U.S. Credit Markets: The Role of the Credit Rating Agencies: Hearing Before the S. Comm. on Banking, Housing and Urban Affairs, 110th Cong. (April 22, 2008) (testimony of Vickie A. Tillman, Executive Vice President, Standard & Poor's Credit Ratings Services), at 3.

<sup>180</sup> Turmoil in U.S. Credit Markets: The Role of the Credit Rating Agencies: Hearing Before the S. Comm. on Banking, Housing and Urban Affairs, 110th Cong. (April 22, 2008) (testimony of Claire Robinson, Senior Managing Director, Moody's Investor Service), at 10.

<sup>181</sup> S. 1073, 111<sup>th</sup> Cong. § 3 (2009); Administration Legislative Proposal, § 932. These proposals would also require the Commission to conduct periodic reviews of the NRSROs' look-back policies. *Id.*

risk associated with the revolving door. Based upon the information discussed above, our review concluded that OCIE should further examine whether revolving door is, in fact, harming the quality of credit ratings, and that TM should analyze this issue.

**Recommendation 19:**

The Office of Compliance Inspections and Examinations should conduct examinations to evaluate whether the revolving door problem is negatively impacting the quality of credit ratings.

**Recommendation 20:**

The Division of Trading and Markets (TM), in consultation with the Office of Compliance Inspections and Examinations (OCIE), the Office of International Affairs (OIA), and the Office of Risk Assessment should assess the problems presented by the revolving door. Depending on the results of OCIE's examination work and TM's analysis, TM should (1) recommend rules to establish requirements to address the revolving door issue as it relates to Nationally Recognized Statistical Rating Organizations (NRSROs); and (2) meet with OIA periodically (e.g., quarterly) to discuss the effects that any foreign laws or rules designed to address the credit rating agency revolving door problem are having, or may have, on NRSROs. If necessary, the Commission should seek legislative authority to implement the proposed rules designed to address the revolving door issue.

**Rule 17g-5 Information Disclosure Program and Proposed Amendment to Regulation Fair Disclosure (FD) Exclusion for NRSROs**

In August 2000, the Commission adopted Regulation FD to address selective disclosure of material non-public information in the securities industry. In adopting Regulation FD, the Commission stated as follows:

The regulation provides that when an issuer, or person acting on its behalf, discloses material non[-]public information to certain enumerated persons (in general, securities market professionals and holders of the issuer's securities who may well trade on the basis of the information), it must make public disclosure of that information.<sup>182</sup>

At the time it adopted Regulation FD, the Commission provided an exclusion (Rule 200(b)(2)(iii) of Regulation FD) from the regulation's requirements for

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<sup>182</sup> Final Rule: Selective Disclosure and Insider Trading, Securities Act Release No. 33-7881 (Aug. 15, 2000), <http://www.sec.gov/rules/final/33-7881.htm>, at 1.

“disclosures to an entity whose primary business is the issuance of credit ratings, provided the information is disclosed solely for the purpose of developing a credit rating and the entity’s ratings are publicly available.”<sup>183</sup> In adopting this exclusion, the Commission stated that it was not aware “of any incidents of selective disclosure [of non-public information] involving ratings organizations.”<sup>184</sup>

On February 2, 2009, the Commission re-proposed, with substantial modifications, amendments to Rule 17g-5 that were originally proposed on June 16, 2008.<sup>185</sup> The Commission’s re-proposed amendments to Rule 17g-5 would prohibit an NRSRO from issuing a credit rating for a structured finance product paid for by the product’s issuer, sponsor, or underwriter unless the information about the product provided to the NRSRO to determine the credit rating and, thereafter, to monitor the rating is made available to other NRSROs.<sup>186</sup> The goal of this proposal “is to increase the number of ratings extant for a given structured finance security or money market instrument and, in particular, promote the issuance of ratings by NRSROs that are not hired by the arranger.”<sup>187</sup> Simultaneously, the Commission proposed to “amend Rule 100(b)(2)(iii) of Regulation FD to permit the disclosure of material non-public information to NRSROs irrespective of whether they make their ratings publicly available.”<sup>188</sup> According to the Commission, “[t]his would accommodate subscriber-based NRSROs that do not make their ratings publicly available for free and it would accommodate NRSROs that access the information under the proposed Rule 17g-5 disclosure program but ultimately do not issue a credit rating using the information.”<sup>189</sup>

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<sup>183</sup> Id. at 7. See 17 C.F.R. § 243.100(b)(2)(iii).

<sup>184</sup> Securities Act Release No. 33-7881 at 7.

<sup>185</sup> Exchange Act Release No. 34-59343. Rule 17g-5, 17 C.F.R. § 17g-5, pertains to NRSRO conflicts of interest.

<sup>186</sup> Specifically, “under the re-proposed amendments: (1) NRSROs that are hired by arrangers to perform credit ratings for structured finance products would need to disclose to other NRSROs (and only other NRSROs) the deals for which they were in the process of determining such credit ratings; (2) the arrangers would need to provide the NRSROs they hire to rate structured finance products with a representation that they will provide information given to the hired NRSRO to other NRSROs (and only other NRSROs); and (3) NRSROs seeking to access information maintained by the NRSROs and the arrangers would need to furnish the Commission an annual certification that they are accessing the information solely to determine credit ratings and will determine a minimum number of credit ratings using the information.” Exchange Act Release No. 34-59343 at 31-32.

<sup>187</sup> Id. at 33.

<sup>188</sup> Id. at 51.

<sup>189</sup> Id.

While the proposed amendments to Rule 17g-5 and Regulation FD may enhance competition among the existing NRSROs by improving the quality of unsolicited credit ratings, they might also adversely impact a CRA that is seeking to become an NRSRO. Under the proposal, only existing NRSROs will have access to the material non-public information. Thus, a CRA that is not an NRSRO (of which there are approximately 57<sup>190</sup>) would not have access to potentially valuable information, thereby possibly reducing the quality of its credit ratings.<sup>191</sup> As a result, it might be difficult for a CRA that is attempting to become an NRSRO to meet the statutory QIB requirement since QIBs may be reluctant to hire a CRA that has issued credit ratings of questionable quality.<sup>192</sup>

In conclusion, the purpose of the proposed amendments to Rule 17g-5 and Regulation FD is to promote the issuance of unsolicited credit ratings as a means to improve the quality of credit ratings, which is in the public interest. However, we have concerns about the potential adverse effects that the proposed rule amendments could have on CRAs that are seeking to become NRSROs. Accordingly, our review found that an assessment of the potential effects of the proposed amendments on competition in the NRSRO industry would be beneficial.<sup>193</sup>

#### **Recommendation 21:**

The Chairman, in concert with the other Commissioners, shall review the Office of Inspector General's findings on the Rule 17g-5 information disclosure program and Regulation Full Disclosure (FD) and, as appropriate and as part of their broader analysis of issues pertaining to Nationally Recognized Statistical Rating Organizations (NRSROs), direct the Division of Trading and Markets, in consultation with the Division of Corporation Finance, the Office of Compliance Inspections and Examinations, the Office of Economic Analysis, and the Office of

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<sup>190</sup> This number was obtained from [www.defaultrisk.com/rating\\_agencies.htm](http://www.defaultrisk.com/rating_agencies.htm), although this does not purport to be a complete list of all of the world's CRAs.

<sup>191</sup> Former Director of the Division of Market Regulation Annette Nazareth previously stated that according to a number of market participants, "a rating agency's access to non[-]public information improves the rating process and results in a more informed and complete credit rating." Memorandum from Annette L. Nazareth, former Director, Division of Market Regulation to former Chairman Donaldson, subject: Letter from Chairman Baker on Issues Relating to Rating Agencies (June 4, 2003), <http://www.sec.gov/spotlight/ratingagency/baker060403.pdf>, at 9.

<sup>192</sup> This problem would be eliminated under the Administration's legislative proposal, which would require all CRAs to register as NRSROs.

<sup>193</sup> While increasing competition among CRAs was one of the stated goals of the Rating Agency Act, some recent academic literature suggests that increased competition may actually lead to lower quality ratings because the incumbent agencies produce more issuer-friendly and less informative ratings when competition is stronger. See Bo Becker and Todd Milbourn, Reputation and competitions; evidence from the credit rating industry, Working Paper 09-051 (2009).

Risk Assessment, to assess the potential effects on competition in the credit rating industry of the re-proposed amendments to Rule 17g-5 and the proposed amendment to Regulation FD and, if appropriate, recommend changes to the rule proposals.

### **Forum Shopping for Credit Ratings**

Forum shopping occurs when an issuer seeks a credit rating from multiple NRSROs, but hires the NRSRO that provides the highest credit rating. This practice results in NRSROs competing with one another as to which NRSRO will give the highest credit rating, and not necessarily which NRSRO will provide the best analysis. Some individuals believe that forum shopping is a fundamental problem among NRSROs.<sup>194</sup>

As previously explained, the Rating Agency Act attempted to improve the quality of credit ratings, in part by increasing competition. However, increased competition could actually reduce the quality of credit ratings because increased competition creates a greater potential for forum shopping since there would be more NRSROs competing for a particular line of business (e.g., credit ratings on structured finance products such as RMBS).<sup>195</sup> In fact, OCIE's 2002 examination report stated as follows:

Moody's and S&P stated to the Staff generally that, while increased competition could potentially pose some benefits, it also might result in a marketplace in which issuers shop for the highest rating, regardless of the quality and accuracy of that rating.<sup>196</sup>

The June 2008 agreement between the NYAG and S&P, Moody's, and Fitch should reduce the potential for forum shopping for RMBS because these NRSROs are required to disclose whether they performed an initial review of a

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<sup>194</sup> See, e.g., Credit Rating Agencies and the Financial Crisis: Hearing Before the H. Comm. On Gov't Oversight and Governmental Reform, 110th Cong. (Oct. 22, 2008) (testimony of Jerome S. Fons, Managing Director, Credit Policy of Moody's Investors Service), <http://oversight.house.gov/documents/20081022102726.pdf>, at 6; Credit Rating Agencies and the Financial Crisis: Hearing Before the H. Comm. On Gov't Oversight and Governmental Reform, 110th Cong. (October 22, 2008) (testimony of Sean J. Egan, Managing Director of Egan-Jones Rating Co.), <http://oversight.house.gov/documents/20081022102906.pdf>, at 9. See also NYAG Press Release, at 1 (stating that investment banks were "able to get free previews of RMBS assessments from multiple credit rating agencies, enabling the investment banks to hire the agency that provided the best rating").

<sup>195</sup> Structured finance products are inherently more susceptible to forum shopping than other types of securities (e.g., corporate bonds) because there is less transparency regarding the underlying assets and the structure of the transaction. Fons, Jerome, White Paper on Rating Competition and Structured Finance (Jan. 10, 2008), <http://www.fonsrisksolutions.com/Documents/Ratings%20White%20Paper.pdf>, at 6-8. (The author is an independent consultant and former Managing Director, Credit Policy, Moody's Investors Service.)

<sup>196</sup> OCIE 2002 Examination Report at 27.

securitization but were not hired by the investment bank that requested the credit rating.<sup>197</sup> Further, according to this agreement with the NYAG, issuers must compensate these NRSROs under a fee-for-service structure, under which they will be compensated regardless of whether the NRSRO is ultimately selected to rate a RMBS.<sup>198</sup> This requirement is intended to eliminate the ability of investment banks to obtain a free preview of the credit rating.

The EU's regulation also addresses the problem of forum shopping and state as follows:

Credit rating agencies should take measures to avoid situations where issuers request the preliminary rating assessment of the structured finance instrument concerned from a number of credit rating agencies in order to identify the one offering the best credit rating for the proposed structure. Issuers should also avoid applying such practices.<sup>199</sup>

The Commission has not adopted any rules specifically designed to address the problem of forum shopping. However, Chairman Schapiro recently testified that she has "directed the Commission staff to explore possible new regulations in [the NRSRO area], including limiting the potential for rating shopping." Also, we were informed during the review that the Division of Corporation Finance is developing rule recommendations designed to address ratings shopping.<sup>200</sup> The increased issuance of unsolicited credit ratings could diminish the adverse consequences of forum shopping because more credit ratings would be available to the public, rather than just the highest credit rating. The Commission's re-proposed information disclosure program discussed above is intended to increase the number and quality of unsolicited credit ratings for structured products, which are more susceptible to forum shopping given their lack of transparency.

In summary, our review found that forum shopping could reduce the quality of credit ratings because issuers would hire an NRSRO based on which NRSRO offered the highest credit rating, as opposed to the quality of the credit rating

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<sup>197</sup> NYAG Press Release, at 1.

<sup>198</sup> *Id.*

<sup>199</sup> EU Regulation at 10, Point 19.

<sup>200</sup> 7/14/09 Schapiro Testimony at 10; 7/22/09 Schapiro Testimony at 9. According to Chairman Schapiro, "[o]ne possible approach would be to require disclosure by issuers of all pre-ratings obtained from NRSROs prior to selecting a firm to conduct a rating, as well as requiring NRSROs to provide additional disclosures." 7/14/09 Schapiro Testimony at 10. The Administration's legislative proposal would require an issuer to disclose all of the preliminary ratings it received from different CRAs so investors will see how much forum shopping occurred and whether there were discrepancies with the final rating. Treasury Press Release at 2; Administration Legislative Proposal, § 934.



analysis. As a result, we believe that Commission action to limit the potential harmful effects of forum shopping would be in the public interest.

#### **Recommendation 22:**

The Chairman, in concert with the Commissioners, shall review the Office of Inspector General's findings on forum shopping for credit ratings and, as appropriate and as part of their broader analysis of issues pertaining to Nationally Recognized Statistical Rating Organizations, direct the Division of Trading and Markets, in consultation with the Office of Compliance Inspections and Examinations, the Office of Economic Analysis, the Office of International Affairs, and the Office of Risk Assessment, to recommend rules designed to reduce the potential harmful effects on the quality of credit ratings caused by forum shopping.

#### **Public Comment on a Firm's Application and the Status of Competition**

The Commission currently has no process in place for soliciting and obtaining public comment on a CRA's application for NRSRO registration. The SEC employs a public comment process in other areas, such as applications for registration as a self-regulatory organization, see Section 19(a)(1) of the Exchange Act.<sup>201</sup> Also, the Federal Communications Commission uses a public comment process to obtain pertinent information to evaluate radio broadcasters' license renewal applications and to assess the state of competition in the wireless telecommunications industry.<sup>202</sup> The Commission's 2003 Concept Release inquired as to whether public comments should be sought initially on a CRA's application for NRSRO designation, and periodically after the Commission designates a CRA as an NRSRO (in order to assess the credibility and reliability of an NRSRO's credit ratings).<sup>203</sup> The Commission received many comments supporting one or both of these concepts, but never acted on the concept release.<sup>204</sup>

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<sup>201</sup> 15 U.S.C. § 78s(a).(1).

<sup>202</sup> See 47 C.F.R. § 73.3580(d)(4)(i)(requiring those filing renewal applications and amendments thereto to include in their pre-filing announcement a statement that "[i]ndividuals who wish to advise the FCC of facts relating to [the] renewal application and to whether [the] station has operated in the public interest should file comments and petitions with the FCC" by a certain date); Public Notice, Federal Communications Commission, Wireless Telecommunications Bureau Seeks Comment on Commercial Mobile Radio Services Market Competition (Feb. 25, 2008), [http://fjallfoss.fcc.gov/edocs\\_public/attachmatch/DA-08-453A1.pdf](http://fjallfoss.fcc.gov/edocs_public/attachmatch/DA-08-453A1.pdf).

<sup>203</sup> Securities Act Release No. 33-8236 at 9-10, Questions 26 and 31.

<sup>204</sup> See <http://www.sec.gov/rules/concept/s71203.shtml> for a listing of the comments submitted in response to the 2003 Concept Release.

Accordingly, our review found that soliciting public comments could enhance the Commission's oversight of NRSROs because securities industry professionals could offer unique insights regarding, in particular, the current state of competition among NRSROs that could augment TM's analysis of market competition (which currently is significantly based on numerical data).<sup>205</sup> Further, public comments could, for example, assist TM in identifying NRSROs that are not following their stated procedures and methodologies or firms that do not have sufficient financial and managerial resources to warrant NRSRO registration.

**Recommendation 23:**

The Chairman, in concert with the other Commissioners, shall review the OIG's findings on public comment on a firm's application and the status of competition and, as appropriate and as part of their broader analysis of issues pertaining to Nationally Recognized Statistical Ratings Organizations (NRSROs), direct the Division of Trading and Markets, in consultation with the Office of Compliance Inspections and Examinations, the Office of Economic Analysis, and the Office of Risk Assessment, to incorporate the seeking and consideration of public comments into the Securities and Exchange Commission's NRSRO oversight process.

## **Finding 5: The SEC's Annual Report to Congress on NRSROs Should be Improved**

The Rating Agency Act requires the Commission to prepare an annual report to Congress. Our review has identified several improvements to assist Congress in its oversight.

Section 6 of the Rating Agency Act requires the Commission to prepare an annual report to Congress regarding NRSROs. Specifically, the Rating Agency Act requires that the Commission's report, for the year to which the report relates:

- (1) identifies applicants for registration under section 15E of the Securities Exchange Act of 1934, as added by this Act;
  - (2) Specifies the number of and actions taken on such applications;
- and

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<sup>205</sup> Such information would also be of assistance to the Commission in connection with its annual report to Congress on the state of competition, transparency, and conflicts of interest among NRSROs that is required by Section 6 of the Rating Agency Act. Pub. L. 109-291, § 6. See Finding 5 below.

(3) specifies the views of the Commission on the state of competition, transparency, and conflicts of interest among nationally recognized statistical rating organizations.<sup>206</sup>

Our review identified several issues that we believe should be included in future annual reports, including:

- An assessment of whether the quality of credit ratings has improved since the Rating Agency Act was enacted.
- Whether the cost of credit ratings has been reduced as a result of increased competition since the enactment of the Rating Agency Act.<sup>207</sup>
- The views of the Federal Trade Commission<sup>208</sup> and/or the Antitrust Division of the Department of Justice<sup>209</sup> on how to assess competition in the NRSRO industry, unless the Commission acquires this type of experience and expertise.
- A summary of the public's comments on the status of competition in the NRSRO (if this information is obtained, see Recommendation 23).
- An assessment on the adequacy of the Commission's resources (e.g., the number of staff and their technical expertise) devoted to NRSRO oversight.
- The effects, if any, of foreign laws and rules regarding CRAs on accountability, competition and transparency with respect to NRSROs.
- Suggested legislative changes designed to improve NRSRO oversight.
- The status of the implementation of the recommendations contained throughout this report and any future recommendations pertinent to NRSRO oversight (e.g., from the Government Accountability Office).<sup>210</sup>

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<sup>206</sup> Pub L. 109-291 § 6.

<sup>207</sup> The Senate Committee on Banking, Housing, and Urban Affairs' Report on the Rating Agency Act (S. 3850) stated as follows: "The Committee believes that eliminating the artificial barrier to entry will enhance competition and provide investors with more choices, higher quality ratings, and lower costs." S. Rep. No. 109-326, at 8 (2006)(emphasis added).

<sup>208</sup> "The [Federal Trade Commission's] competition mission is to enforce the rules of the competitive marketplace — the antitrust laws. These laws promote vigorous competition and protect consumers from anticompetitive mergers and business practices." FTC Guide to the Antitrust Laws, <http://www.ftc.gov/bc/antitrust/index.shtm>.

<sup>209</sup> "For over six decades, the mission of the Antitrust Division [of the Department of Justice] has been to promote and protect the competitive process — and the American economy — through the enforcement of the antitrust laws." Overview, Antitrust Division, <http://www.usdoj.gov/atr/overview.html>.

<sup>210</sup> Section 7 of the Rating Agency Act requires the Government Accountability Office ("GAO") to perform a study of the implementation and impact of the Act, as described in Appendix II, "Scope and Methodology." The Rating Agency Act requires GAO to report the results of its study not earlier than three years nor later than four years after the date of enactment of the Rating Agency Act, i.e., between September 29, 2009 and

Based upon the work performed during our review, we determined that incorporating the concepts listed above into the SEC's annual report could aid Congress by providing it with additional information on the effectiveness of the Rating Agency Act and the Commission's implementing rules in improving oversight of NRSROs.

**Recommendation 24:**

The Division of Trading and Markets, in consultation with Office of Compliance Inspections and Examinations, the Office of Economic Analysis, the Office of International Affairs, the Office of Risk Assessment and the Office of the General Counsel, should incorporate the additional concepts identified by the Office of Inspector General's review into the Commission's annual report to Congress on Nationally Recognized Statistical Rating Organizations.

September 29, 2010. P. Law 109-291, § 7. GAO announced in early July 2009 that it was initiating a review of the implementation of the Rating Agency Act. The planned scope of that review includes an assessment of (1) the SEC's implementation and enforcement of the Rating Agency Act, including SEC oversight of NRSROs; (2) the SEC's and market participants' views on the implementation, impact, and effectiveness of the Rating Agency Act and related SEC rules, including their impact on rating quality, financial markets, and competition among CRAs; and (3) the influence of NRSRO ratings or references to them in Federal regulations on investment guidelines and decisions, competition among CRAs, rating quality and regulatory oversight. Letter from Richard J. Hillman, Managing Director, Financial Markets and Community Investment, GAO, to Diego Tomas Ruiz, Executive Director, SEC (July 7, 2009). Further, both the RATE Act and the Administration's legislative proposal would require another GAO study within 30 months of the bill becoming law. S. 1073, 111<sup>th</sup> Cong. § 6 (2009); Administration Legislative Proposal, §936.

## Acronyms

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A.M. Best	A.M. Best Company, Inc.
Basel Committee	Basel Committee on Banking Supervision
CDO	Collateralized Debt Obligations
Commission	The Securities and Exchange Commission
CRA	Credit Rating Agency
DBRS	Dominion Bond Rating Service Limited
EJR	Egan-Jones Ratings Company
EU	The European Union
Enron	Enron Corp.
Exchange Act	The Securities Exchange Act of 1934
Fitch	Fitch Inc.
GAAP	General Accepted Accounting Principles
GAO	Government Accountability Office
IOSCO	International Organization of Securities Commissions
JCR	Japan Credit Rating Agency, Ltd
LACE	LACE Financial Corp
Moody's	Moody's Investor Services, Inc.
NRSROs	Nationally Recognized Statistical Rating Organizations
NYAG	New York Attorney General
OCIE	The Office of Compliance Inspections and Examinations
OEA	The Office of Economic Analysis
OGC	The Office of the General Counsel
OIA	The Office of International Affairs
OIG	The Office of Inspector General
PCAOB	Public Company Accounting Oversight Board
QIB	Qualified Institutional Buyer
RATE Act	The Rating Accountability and Transparency Enhancement Act of 2009
Rating Agency Act	The Credit Rating Agency Reform Act of 2006
R&I	Rating and Investment Information Inc.
Realpoint	Realpoint LLC
Regulation FD	Regulation Fair Disclosure
RMBS	Residential Mortgage Backed Securities
S&P	Standard and Poor's Division of the McGraw-Hill Companies Inc.
SEC	The Securities and Exchange Commission

**Appendix I**

Sarbanes-Oxley Act  
TM  
U.S.

The Sarbanes Oxley Act of 2002  
The Division of Trading and Markets  
United States of America

## Scope and Methodology

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**Scope.** We reviewed the history of the Commission's involvement with NRSROs beginning in 1994 and focusing on the period after Enron's bankruptcy in 2001. As part of that review, we obtained an extensive amount of information, including Commission concept releases, proposed rule releases, final rule releases, examination reports, staff studies, public hearing transcripts, as well as a Congressional staff investigative report and hearing records. The review also focused on the implementation of and compliance with the Rating Agency Act, which became law on September 29, 2006, and the Commission's rules promulgated thereunder. In order to assess the Commission's efforts to implement the Rating Agency Act's objectives of accountability, competition, and transparency, we obtained from TM all 11 NRSRO applications that had been submitted by ten CRAs, as well as TM's action memoranda to the Commission recommending approval of the applications.<sup>211</sup> We also obtained from TM the NRSROs' subsequent annual amendments to their NRSRO registration and annual financial reports, as well as the Commission's June 2008 annual report as required by Section 6 of the Rating Agency Act. Finally, we obtained information pertinent to the CRAs' involvement in the recent credit crisis and the Commission's response, including Commission proposed rule releases, final rule releases, examination reports, reports prepared by outside organizations and Congressional hearing materials, as well as recently-proposed legislation.

We conducted our review from October 2008 to July 2009.

**Methodology.** In order to meet the objectives of identifying improvements in the Commission's NRSRO oversight and reviewing the Commission's history with the NRSROs, we obtained and analyzed numerous Commission materials, including NRSRO examination reports and module, concept releases, proposed rule releases, final rule releases, transcripts of hearings (i.e., roundtables), staff studies, and the annual report to Congress on NRSROs. We also reviewed an extensive amount of information from sources outside the Commission, including Congressional investigative reports and hearing materials, proposed legislation, a recent study by the Department of the Treasury, academic papers, and international standards (e.g., the EU's regulation and an IOSCO report and code of conduct). We conducted interviews of several staff from TM, OCIE OIA, OEA and the Office of Risk Assessment in order to obtain an understanding of the

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<sup>211</sup> The Commission has designated a total of ten CRAs as NRSROs. One NRSRO submitted two applications – an initial one to issue certain classes of ratings and a second one to issue additional classes of ratings. The Commission has not denied any NRSRO applications.

## Appendix II

Commission's role regarding and oversight of NRSROs, to identify areas for improvement and to confirm our findings.

To meet our objective of focusing on the implementation of and compliance with the Rating Agency Act and Commission rules, we conducted detailed testing to determine compliance with the requirements of the Act and the implementing rules. In order to perform our testing, we reviewed all 11 NRSRO applications that were submitted to the Commission since the enactment of the Rating Agency Act in September 2006, and TM's action memoranda to the Commission recommending approval of these applications. We also reviewed the subsequently-filed annual amendments to the firms' NRSRO registration and the annual financial reports required by the Commission's rules. We evaluated these documents to determine compliance with the various requirements of the Rating Agency Act and the Commission's implementing regulations. We also assessed whether, based upon the available information, TM's recommendations that the Commission approve the CRAs' applications for NRSRO designation were appropriate and in the public interest.

In addition, consistent with our objective of identifying improvements in the Commission's NRSRO oversight, we analyzed the CRAs' role regarding Enron's bankruptcy and the recent credit crisis in order to identify policy issues that the Commission should address in order to strengthen the Commission's oversight of NRSROs. We also evaluated recent efforts to strengthen controls over the accounting profession and equity research analysts because accountants and equity research analysts act as critical gatekeepers in the securities industry, as do the NRSROs. We analyzed whether developments and changes made in these other areas could be applied to NRSROs in order to strengthen the Commission's oversight of NRSROs and improve the quality of credit ratings. Finally, we obtained information concerning the public comment process used by the Federal Communications Commission in considering whether the SEC should adopt such a process for evaluating NRSRO applications and assessing the state of competition in the credit rating industry.

**Internal/Management Controls.** We reviewed internal controls that were considered significant within the context of our objectives. We interviewed staff and management from TM and other organizations and reviewed the processes surrounding the receipt and review of, and recommendations on, applications by CRAs for NRSRO registration, as well as the receipt and review of NRSRO annual filings and certifications.



## Criteria

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**The Credit Rating Agency Reform Act of 2006, Public Law 109-291.**

Legislation enacted to improve the quality of credit ratings for the protection of investors and in the public interest by fostering accountability, transparency, and competition in the credit rating industry. Established for the first time a formal application process for CRAs to qualify as NRSROs. Enacted on September 29, 2006.

**The Sarbanes-Oxley Act of 2002, Public Law 107-204.** Legislation that set new or enhanced standards for all U.S. public companies and public accounting firms. Created the PCAOB to oversee, regulate, inspect and discipline accounting firms in their roles as auditors of public companies. Enacted on July 30, 2002.

**Commission Rules Regarding NRSROs, 17 C.F.R. §§ 240.17g-1 to 240.17g-6.** Implemented the requirements of the Rating Agency Act. Initially adopted on June 5, 2007, in Exchange Act Release No. 34-55857, and amended on February 2, 2009 in Exchange Act Release No. 34-59342.

**Commission Form NRSRO and Accompanying Instructions.** Form on which CRAs initially apply for NRSRO designation, apply to rate additional classes of credit ratings, supplement an application, provide the require annual certification and update their registration. Initially adopted by the Commission in Exchange Act Release No. 34-55857, dated June 5, 2007.

**Report of the Staff to the Senate Committee on Governmental Affairs on Financial Oversight of Enron: The SEC and Private-Sector Watchdogs.** Documented the results of the Committee's review of the financial oversight of Enron and the roles of private sector watchdogs, including the CRAs. Issued on October 8, 2002.

**Commission Report on the Role and Function of Credit Rating Agencies in the Operation of the Securities Markets.** Addressed topics identified for study by Section 702(b) of the Sarbanes-Oxley Act of 2002. Issued in January 2003.

## Appendix III

**Commission Concept Release on Rating Agencies and the Use of Credit Ratings under the Federal Securities Laws.** Sought comments on various issues relating to CRAs as part of the Commission's review of the role of CRAs in the operation of the securities markets. Issued as Securities Act Release No. 33-8236 on June 4, 2003.

**Summary Report of Issues Identified in the Commissions Staff's Examinations of Select Credit Rating Agencies.** Summarized issues identified in Commission examinations of three CRAs to review their role in the recent turmoil in the subprime mortgage securities markets. Issued on July 8, 2008.

**IOSCO Final Report on the Role of Credit Rating Agencies in Structured Finance Markets and Revised Code of Conduct Fundamentals for Credit Rating Agencies.** Contains an analysis of the role CRAs play in the structured finance market and makes recommendations for revisions to IOSCO's CRA Code of Conduct. Issued by IOSCO's Technical Committee in May 2008.

**EU's Proposal for a Regulation of the European Parliament and of the council on Credit Rating Agencies.** Contains the EU's proposed regulation for CRAs, which play an important role in global securities and banking markets. The European Parliament approved the proposed regulation as amended on April 23, 2009, and the European Council approved the regulation on July 27, 2009.

**Department of Treasury Report on Financial Regulatory Reform.** Proposed several reforms to restore confidence in the integrity of the U.S. financial system in light of the recent financial crisis. Recommended reforms include the strengthening of SEC regulation of CRAs. Issued in June 2009.

## List of Recommendations

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### Recommendation 1:

The Division of Trading and Markets (TM) should ensure that all significant issues identified in the application review process are resolved before it recommends that a credit rating agency (CRA) be registered as a Nationally Recognized Statistical Rating Organization. One way to resolve issues would be to require that the Office of Compliance Inspections and Examinations complete an examination of a CRA before TM makes a recommendation on the application to the Securities and Exchange Commission (which would require additional legislative authority, see Recommendation 9).

### Recommendation 2:

The Division of Trading and Markets, in consultation with the Office of Compliance Inspections and Examinations (OCIE) and the Office of Economic Analysis, should evaluate whether action should be taken regarding the credit rating agency (CRA) that was granted registration as a Nationally Recognized Statistical Rating Organization (NRSRO), despite the numerous significant problems identified with its applications. These actions could include, as deemed appropriate, making a referral to the Division of Enforcement for consideration of censure, suspension, or other remedies specified in Section 15E(d) of the Securities Exchange Act of 1934. The evaluation should consider any new information obtained (e.g., from the OCIE examination of the CRA) since the CRA's applications were approved.

### Recommendation 3:

The Division of Trading and Markets should ensure that all pending issues identified during the application process involving the credit rating agencies that the Securities and Exchange Commission approved as Nationally Recognized Statistical Rating Organizations are resolved within six months of the date of issuance of the Office of Inspector General's report.

### Recommendation 4:

The Division of Trading and Markets, in consultation with the Office of Economic Analysis and the Office of Compliance Inspections and Examinations, should

## Appendix IV

develop measures for determining whether subscriber fees charged by the credit rating agencies are reasonable.

### **Recommendation 5:**

The Division of Trading in Markets (TM), in consultation with the Office of Compliance Inspections and Examinations, the Office of Economic Analysis, and the Office of Risk Assessment, should request that the Office of General Counsel develop guidance regarding the types of deficiencies, (e.g., overly broad disclosures) that should prompt TM either to (1) seek consent from the applicant to waive the 90-day statutory time period for granting an application for registration as a Nationally Recognized Statistical Rating Organization (NRSRO), or (2) recommend instituting proceedings to determine whether registration should be denied.

### **Recommendation 6:**

The Division of Trading and Markets and the Office of Compliance Inspections and Examinations should take appropriate actions to inform Nationally Recognized Statistical Rating Organizations about the Commission's expectations regarding the experience of their compliance officers.

### **Recommendation 7:**

The Division of Trading and Markets should ensure that it seeks Commission orders in response to requests by Nationally Recognized Statistical Rating Organizations for extensions of time when required by statute or the Commission's rules.

### **Recommendation 8:**

The Division of Trading and Markets should ensure that credit rating agencies applying for designation as Nationally Recognized Statistical Rating Organizations (NRSROs) and firms that have registered as NRSROs comply with the Commission's rules and requirements regarding the filing and certification of financial information.

### **Recommendation 9:**

The Chairman, in concert with the other Commissioners, shall review the Office of Inspector General's findings on conducting examinations before issuing orders

## Appendix IV

approving applications and, as appropriate and as part of their broader analysis of issues pertaining to Nationally Recognized Statistical Rating Organizations (NRSROs), direct the Office of Compliance Inspections and Examinations and the Division of Trading and Markets, in consultation with the Office of the General Counsel, to seek legislative authority to conduct examinations as part of the NRSRO application process. As part of this review, the Chairman and Commissioner should consider:

- Whether the current 90-day statutory time period should be extended to allow for examinations to be conducted; and
- What additional staffing resources would be required to implement this additional responsibility.

### **Recommendation 10:**

The Office of Compliance Inspections and Examinations (OCIE) should include the Nationally Recognized Statistical Rating Organizations (NRSROs) in its pilot monitoring program. Given the different sizes (i.e., market dominance) of the various NRSROs and the current examination cycle, OCIE should specifically tailor its monitoring program for each particular NRSRO.

### **Recommendation 11:**

The Office of Compliance Inspections and Examinations (OCIE), in consultation with the Ethics Office and the Office of Administrative Services, should obtain an additional review of the draft OCIE Nationally Recognized Statistical Rating Organization (NRSRO) examination module by an expert in credit rating and NRSRO matters.

### **Recommendation 12:**

The Chairman, in concert with the other Commissioners, shall review the Office of Inspector General's findings concerning PCAOB oversight of NRSRO auditors, and as appropriate and as part of their broader analysis of issues pertaining to Nationally Recognized Statistical Rating Organizations (NRSROs), direct the Division of Trading and Markets (TM), in consultation with the Office of the Chief Accountant, the Office of Risk Assessment and the Office of the General Counsel, to seek legislative authority to provide the Public Company Accounting Oversight Board (PCAOB) with oversight over audits of NRSROs. If that authority is obtained, TM should recommend rules that require NRSROs and credit rating agencies seeking to become NRSROs to use auditors that are overseen by the PCAOB.

**Recommendation 13:**

The Office of Compliance Inspections and Examinations should perform examination work to determine whether the quality of credit ratings is being adversely affected by Nationally Recognized Statistical Rating Organizations (NRSROs) performing consulting and advisory services for issuers, underwriters or obligors that have paid the NRSROs for credit ratings.

**Recommendation 14:**

The Division of Trading and Markets (TM), in consultation with the Office of Compliance Inspections and Examinations (OCIE), the Office of Economic Analysis, the Office of International Affairs, and the Office of Risk Assessment, should assess the impact of the provision of consulting and advisory services on the quality of credit ratings and how best to minimize the potential harmful effects, without unduly limiting competition among the Nationally Recognized Statistical Rating Organizations (NRSROs). If warranted by the results of OCIE's examination work and TM's analysis, TM should recommend that the Commission propose appropriate rules designed to prevent an NRSRO's consulting and advisory services from potentially adversely affecting the quality of credit ratings.

**Recommendation 15:**

The Chairman, in concert with the other Commissioners, shall review the Office of Inspector General's findings on monitoring of credit ratings and, as appropriate and as part of their broader analysis of issues pertaining to Nationally Recognized Statistical Rating Organizations (NRSROs), direct the Division of Trading and Markets (TM), in consultation with the Office of Compliance Inspections and Examinations, the Office of Economic Analysis, the Office of International Affairs (OIA), the Office of Risk Assessment, and the Office of the General Counsel, to recommend appropriate rules to implement a comprehensive credit rating monitoring requirement for Nationally Recognized Statistical Rating Organizations (NRSROs). TM should also meet with OIA periodically (e.g., quarterly) to discuss the effects that any foreign laws or rules regarding credit rating monitoring are having, or may have, on the NRSROs.

**Recommendation 16:**

The Office of Compliance Inspections and Examinations should perform examination work into whether, and under what circumstances, credit rating

## Appendix IV

analysts face undue influence and the effects of such undue influence on the credit ratings issued by Nationally Recognized Statistical Rating Organizations.

### **Recommendation 17:**

The Division of Trading and Markets (TM), in consultation with the Office of Compliance Inspections and Examinations (OCIE), the Office of International Affairs (OIA), and the Office of Risk Assessment, should assess the effects of undue influence on the quality of credit ratings and the potential benefits of a credit analyst rotation requirement. Depending on the results of OCIE's examination work and TM's analysis, TM should recommend rules to address the risk of undue influence. TM should also meet with OIA periodically (e.g., quarterly) to discuss the effects that any foreign laws or rules on credit rating analyst rotation are having, or may have, on the Nationally Recognized Statistical Rating Organizations. If necessary, the Commission should seek legislative authority to implement the proposed rules designed to address the risk of undue influence.

### **Recommendation 18:**

The Chairman, in concert with the other Commissioners, shall review the Office of Inspector General's findings on credit ratings disclosures and, as appropriate and as part of their broader analysis of issues pertaining to Nationally Recognized Statistical Rating Organizations (NRSROs), direct the Division of Trading and Markets, in consultation with the Office of Compliance Inspections and Examination, the Office of Economic Analysis, and the Office of Risk Assessment, to recommend additional rule amendments to enhance the disclosures surrounding the credit ratings process, including, for example, the key assumptions used in credit ratings methodologies and procedures, and any shortcomings of or limitations on credit ratings.

### **Recommendation 19:**

The Office of Compliance Inspections and Examinations should conduct examinations to evaluate whether the revolving door problem is negatively impacting the quality of credit ratings.

### **Recommendation 20:**

The Division of Trading and Markets (TM), in consultation with the Office of Compliance Inspections and Examinations (OCIE), the Office of International Affairs (OIA), and the Office of Risk Assessment should assess the problems

## Appendix IV

presented by the revolving door. Depending on the results of OCIE's examination work and TM's analysis, TM should (1) recommend rules to establish requirements to address the revolving door issue as it relates to Nationally Recognized Statistical Rating Organizations (NRSROs); and (2) meet with OIA periodically (e.g., quarterly) to discuss the effects that any foreign laws or rules designed to address the credit rating agency revolving door problem are having, or may have, on NRSROs. If necessary, the Commission should seek legislative authority to implement the proposed rules designed to address the revolving door issue.

### **Recommendation 21:**

The Chairman, in concert with the other Commissioners, shall review the Office of Inspector General's findings on the Rule 17g-5 information disclosure program and Regulation Full Disclosure (FD) and, as appropriate and as part of their broader analysis of issues pertaining to Nationally Recognized Statistical Rating Organizations (NRSROs), direct the Division of Trading and Markets, in consultation with the Division of Corporation Finance, the Office of Compliance Inspections and Examinations, the Office of Economic Analysis, and the Office of Risk Assessment, to assess the potential effects on competition in the credit rating industry of the re-proposed amendments to Rule 17g-5 and the proposed amendment to Regulation FD and, if appropriate, recommend changes to the rule proposals.

### **Recommendation 22:**

The Chairman, in concert with the Commissioners, shall review the Office of Inspector General's findings on forum shopping for credit ratings and, as appropriate and as part of their broader analysis of issues pertaining to Nationally Recognized Statistical Rating Organizations, direct the Division of Trading and Markets, in consultation with the Office of Compliance Inspections and Examinations, the Office of Economic Analysis, the Office of International Affairs, and the Office of Risk Assessment, to recommend rules designed to reduce the potential harmful effects on the quality of credit ratings caused by forum shopping.

### **Recommendation 23:**

The Chairman, in concert with the other Commissioners, shall review the Office of Inspector General's findings on public comment on a firm's application and the status of competition and, as appropriate and as part of their broader analysis of issues pertaining to Nationally Recognized Statistical Ratings Organizations,



## Appendix IV

(NRSROs) direct the Division of Trading and Markets, in consultation with the Office of Compliance Inspections and Examinations, the Office of Economic Analysis, and the Office of Risk Assessment, to incorporate the seeking and consideration of public comments into the Securities and Exchange Commission's NRSRO oversight process.

### **Recommendation 24:**

The Division of Trading and Markets, in consultation with Office of Compliance Inspections and Examinations, the Office of Economic Analysis, the Office of International Affairs, the Office of Risk Assessment and the Office of the General Counsel, should incorporate the additional concepts identified by the Office of Inspector General's review into the Commission's annual report to Congress on Nationally Recognized Statistical Rating Organizations.

## Comments from the Office of the Chairman

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### MEMORANDUM

TO: H. David Kotz  
Inspector General

FROM: Mary L. Schapiro  
Chairman

SUBJECT: Response to OIG Report No. 458 – *The SEC’s Role Regarding and Oversight of Nationally Recognized Statistical Rating Organizations (NRSROs)*

DATE: August 27, 2009

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#### I. Introduction

This is in response to the Office of Inspector General’s (OIG’s) draft report entitled *The SEC’s Role Regarding and Oversight of Nationally Recognized Statistical Rating Organizations (NRSROs)* (the Report). As you know, ordinarily the SEC’s divisions and offices to which OIG recommendations are directed respond to draft reports. This typically does not include the Chairman or other Commissioners. However, because of the scope of the audit, you make numerous policy-focused recommendations in the Report that are appropriately directed to me, as the Commission’s Chairman. It is in this capacity that I am providing you with my response, which should be viewed as supplementing the responses that you receive from SEC divisions and offices.

#### II. Recommendations Directed to the Chairman

In the Report’s Finding 4, you conclude that “[t]he Commission should address several policy issues in order to improve NRSRO oversight.” These policy issues are:

## Appendix V

- Consider seeking legislation that would require NRSRO auditors to be subject to PCAOB oversight (Recommendation 12)
- Consider additional rules to specifically require that NRSROs systematically monitor credit ratings, and upgrade or downgrade ratings as appropriate (Recommendation 15)
- Consider additional rules to enhance disclosures surrounding the credit ratings process, including for example, the key assumptions used in credit ratings methodologies and procedures, and any shortcomings of or limitations on the credit ratings (Recommendation 18)
- Assess the potential effects on competition in the credit rating industry of the re-proposed amendments to Rule 17g-5 and the proposed amendment to Regulation FD and, if appropriate, recommend changes to the rule proposals (Recommendation 21)
- Consider rules designed to reduce the potential harmful effects on the quality of credit ratings caused by forum shopping (Recommendation 22)
- Consider rules that would allow the public to comment on a credit rating agency's NRSRO application, and periodically thereafter on the NRSRO's performance (Recommendation 23)

As noted in the Report, many of these recommendations have been considered for some time or are currently being actively analyzed. I expect the Commission to consider a full range of additional rules – finalizing some previous proposals and proposing new ones – within the next few weeks. Accordingly, I concur with your recommendation that each of these issues is worthy of consideration. To follow up, my office will work with staff from SEC's divisions and offices to provide you with our assessment and the conclusions that we reach after due consideration. As always, if you would like additional information, please feel free to contact me.

## Comments from the Division of Trading and Markets

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### MEMORANDUM

**TO:** H. David Kotz  
Inspector General, Office of the Inspector General

**FROM:** Daniel Gallagher  
Acting Co-Director, Division of Trading and Markets

**RE:** The Management Response of the Division of Trading and Markets to the Office of Inspector General Report No. 458, The SEC's Role Regarding Oversight of Nationally Recognized Statistical Rating Organizations

Appendix I Management Response to the Recommendations Directed to the Division of Trading and Markets

Appendix II Legal Analysis of the Division of Trading and Markets Regarding the Decision of the Securities and Exchange Commission to Grant the Applications of the Credit Rating Agency Referenced in Finding 1

**DATE:** August 27, 2009

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### **I. INTRODUCTION**

Thank you for the opportunity to respond to the recommendations in your August 18, 2009 draft report – The SEC's Role Regarding Oversight of Nationally Recognized Statistical Rating Organizations (the "Report"). At the outset, we want to extend our appreciation for the professional and collegial process undertaken by your staff in conducting the audit. The responses to recommendations directed to the Division of Trading and Markets ("TM") are attached as Appendix I.

In this cover memo, we briefly describe TM's efforts in support of the Securities and Exchange Commission's ("Commission") oversight of nationally recognized statistical rating organizations ("NRSROs") and highlight some issues raised by the Report. As you will see, the Division generally agrees with the Report's

recommendations. There are some issues, however, on which we respectfully take a different view.

## II. TM EFFORTS IN SUPPORT OF THE COMMISSION'S NRSRO OVERSIGHT

Before discussing the Report's Findings, we believe it is important to describe TM's efforts to support the Commission's oversight of NRSROs under the Credit Rating Agency Reform Act of 2006 (the "Rating Agency Act"). As noted in the Report, Congress enacted the Rating Agency Act in September 2006 and mandated that the Commission adopt final rules establishing a registration and oversight program for NRSROs within 270 days. TM staff moved quickly to conceive a program and worked diligently during the notice and comment rulemaking process to ensure the Commission met the statutory deadline by adopting final rules in June 2007. Upon adoption, seven credit rating agencies applied simultaneously to register as NRSROs. TM staff processed each application in a thorough manner, as indicated by the detailed memos to the Commission cited in the Report, but also quickly enough to allow the Commission time to review the staff's recommendations and act on the applications within the 90-day period mandated by the Rating Agency Act. The issues identified by the staff in the memos to the Commission have provided the Office of Compliance, Inspections and Examinations ("OCIE") with useful information to focus their reviews of the NRSROs.

In August 2007, TM and staffs from OCIE and the Office of Economic Analysis ("OEA") commenced extensive examinations of the three largest NRSROs – Fitch Ratings, Ltd., Moody's Investor Services, Inc., and Standard & Poor's Ratings Services – to review their activities in rating structured finance products linked to subprime mortgages. TM staff attended multi-day on-site visits to the NRSROs to conduct interviews of personnel, reviewed and analyzed thousands of pages of information from deal files, and assisted in drafting the examination report. Before the examinations were complete, TM staff began developing a second round of rulemaking for NRSROs, which was informed, in part, on preliminary findings from the examination and that aimed to address the role that NRSROs played in the credit market turmoil. These rules were proposed in June 2008 and adopted by the Commission in February 2009. Also in June 2008, the Commission issued its first annual report to Congress as mandated by the Rating Agency Act, which TM staff played a lead role in drafting. Finally, in February 2009, the Commission proposed additional NRSRO rules upon the recommendation of TM. Currently, TM is working on further proposals and final rulemaking for Commission consideration.

On the international front, TM staff serves on the new permanent standing committee on credit rating agencies of the Technical Committee of the International

Organization of Securities Commissions (“IOSCO”). This committee, comprised of supervisors from jurisdictions in Europe, Asia and the Americas, has two primary responsibilities: (1) to discuss, evaluate and consider regulatory and policy initiatives vis-à-vis credit rating agency activities and oversight, in an effort to seek cross-border regulatory consensus through such means as the IOSCO credit rating agency code; and (2) to facilitate regular dialogue between securities regulators and the credit rating industry.

### III. TM VIEWS ON THE FIVE FINDINGS IN THE REPORT

#### A. Finding 1

TM concurs in part with many of the recommendations resulting from Finding 1 and with the legal conclusion in the finding that the Rating Agency Act would need to be amended to allow the Commission to perform an examination during the NRSRO application process. However, TM respectfully disagrees with the legal conclusion in the finding that the Commission should not have granted one credit rating agency’s NRSRO applications. As explained further in Appendix II, the Commission’s consideration of NRSRO applications is to be based primarily on information submitted by the applicant in Form NRSRO. An applicant is to be granted registration if the application is complete. To successfully deny an application, the Commission must make substantial factual and legal findings. The issues identified by TM in reviewing the application did not provide a legally viable basis for denying the application (it should be noted that these were the staff’s views and did not necessarily reflect the views of the Commissioners). Moreover, the legislative history of the Rating Agency Act makes clear that it was designed to increase competition in the credit rating industry by lowering barriers to achieving NRSRO status. For these reasons, TM recommended that the Commission grant the registrations and that the issues identified by the staff be followed-up when the firm was examined. The Commission agreed with the recommendation.

#### B. Finding 2

TM concurs with the recommendations resulting from Finding 2. TM will strengthen the internal controls for reviewing forms and reports furnished to the Commission and, if TM discovers that a form or report lacks required information or is not certified in the manner prescribed by rule, TM will reject it and request that the NRSRO furnish a corrected form or report. TM also will consult with the Commission on how it prefers to handle routine requests for extensions of time to furnish these forms and reports (e.g., by the staff no-action process, exemptive authority delegated to TM, or by vote of the Commission). TM believes it acted appropriately in using the no-action process as a legal matter and as a mechanism to achieve efficiencies and conserve

## Appendix V

Commission resources. Nonetheless, TM will consult with the Commission on how it prefers that these requests be handled in the future.

### C. Finding 3

Finding 3 proposes, among other things, that the Commission consider whether the Rating Agency Act should be amended to permit an examination of a credit rating agency during the NRSRO application process. Recommendation 9 states that, if the Commission believes this would be an appropriate change to the Rating Agency Act, the Commission should direct TM, OCIE, and the Office of General Counsel to “seek legislative authority to conduct examinations as part of the NRSRO application process.” TM staff is not authorized to ask Congress to enact legislation, but we would be able to provide technical assistance to Congress should it decide to propose such legislation.

### D. Finding 4

Finding 4 identifies a number of policy questions that should be considered in order to enhance the Commission’s oversight of NRSROs. In some cases, the Report recommends that TM, in consultation with OCIE and other offices, analyze whether steps should be taken to address potential practices that could adversely impact the quality of credit ratings. TM notes that the Commission has adopted rules to address the potential conflicts identified in the recommendations (e.g., being paid by issuers to determine credit ratings). Nonetheless, TM agrees that, if OCIE finds during its examination work that the conflicts are not being adequately addressed by the Commission’s rules, TM will analyze the evidence supporting OCIE’s finding and determine whether it would be appropriate to recommend that the Commission take further action through additional rulemaking or other measures.

### E. Finding 5

Recommendation 24 resulting from Finding 5 states that TM, in consultation with other Commission offices, should address eight new topics in the Commission’s annual report to Congress. TM notes that the Rating Agency Act specifically prescribes the topics that are to be addressed in the report and that the report is from the Commission. Consequently, TM defers to the Commission the decision on whether the annual report should address these topics. However, TM would need to re-allocate substantial resources in terms of staff time to undertake the work necessary to include the suggested topics. This would divert staff resources from work TM believes is a priority to support the Commission’s NRSRO oversight responsibilities. TM believes Finding 5 raises important policy and programmatic questions and that there may be other ways to address several of the questions posed.

## APPENDIX I

### **Management Response to the Recommendations Directed to the Division of Trading and Markets**

As indicated below, the Division of Trading and Markets: (1) concurs with recommendations 5, 6, 8, 14, 15, 17, and 20; (2) concurs in part with recommendations 1, 2, 3, 4, and 7; and (3) does not concur with recommendation 24.

*Recommendation 1: The Division of Trading and Markets (TM) should ensure that all significant issues identified in the application review process are resolved before it recommends that a Credit Rating Agency (CRA) be registered as a Nationally Recognized Statistical Rating Organization. One way to resolve issues would be to require that the Office of Compliance Inspections and Examinations complete an examination of a CRA before TM makes a recommendation on the application to the Securities and Exchange Commission (which would require additional legislative authority, see Recommendation 9).*

**Management Response:** Within the limitations of the 90-day time period during which the Commission may review a complete application, TM will endeavor to resolve all outstanding significant issues identified during the application process to the extent practicable and consistent with the statutory requirements of the Credit Rating Agency Reform Act of 2006 (“Rating Agency Act”). As explained in more detail in Appendix II, the Rating Agency Act mandates that the Commission grant a credit rating agency’s application for registration as a nationally recognized statistical rating organization (“NRSRO”) within 90 days or commence proceedings to determine whether the application should be denied. The Commission must make specific findings to deny an application for registration. Further, there is no express authority in the Rating Agency Act to examine a credit rating agency prior to it being registered as an NRSRO; nor is there time to conduct such an examination given the 90 days prescribed in the statute. If an application meets the requirements of the Rating Agency Act, and there is not sufficient evidence to support the findings necessary to deny an application, TM will continue to advise the Commission of significant issues and make them known to the Office of Compliance, Inspections and Examinations (“OCIE”) for follow-up. TM agrees with the Report’s finding that new legislation would be necessary to allow OCIE to conduct an examination of a credit rating agency during the NRSRO application process.



## Appendix V

*Recommendation 2: The Division of Trading and Markets, in consultation with the Office of Compliance Inspections and Examinations (OCIE), and the Office of Economic Analysis, should evaluate whether action should be taken regarding the Credit Rating Agency (CRA) that was granted designation as a Nationally Recognized Statistical Rating Organization (NRSRO), despite the numerous significant problems identified with its applications. These actions could include, as deemed appropriate, making a referral to the Division of Enforcement for consideration of censure, suspension, or other remedies specified in Section 15E(d) of the Securities Exchange Act of 1934. The evaluation should consider any new information obtained (e.g., from the OCIE examination of the CRA) since the CRA's applications were approved.*

**Management Response:** The Commission's authority to examine NRSROs rests with OCIE. OCIE, based on its findings during an examination, may make a referral to the Division of Enforcement ("Enforcement"). Enforcement has been delegated the Commission's authority to investigate potential violations of the securities laws, and Enforcement makes recommendations to the Commission regarding such violations. Both OCIE and Enforcement consult with TM, as they deem appropriate, during these processes if rules administered by TM are implicated. TM will provide any guidance they request relating to NRSROs.

*Recommendation 3: The Division of Trading and Markets should ensure that all pending issues identified during the application process involving the Credit Rating Agencies that the Securities and Exchange Commission designated as Nationally Recognized Statistical Rating Organization are resolved within six months of the date of issuance of the Office of Inspector General's audit report.*

**Management Response:** TM will do an analysis of how many of the outstanding issues identified in the applications have not been resolved to date. TM will endeavor to resolve issues that do not require examination within six months. Issues that only can be resolved through examination will be referred to OCIE, and TM will work with OCIE to ensure that those issues are resolved in a timely manner.

*Recommendation 4: The Division of Trading and Markets, in consultation with the Office of Economic Analysis, and the Office of Compliance Inspections and Examinations, should develop measures for determining whether subscriber fees charged by the credit rating agencies are reasonable.*

**Management Response:** TM will consult with the Commission to determine whether it believes this work should be undertaken. TM notes that when

## Appendix V

proposing the first round of NRSRO rules, the Commission stated that it “preliminarily believes that the determination of whether a fee for accessing or obtaining credit ratings is reasonable would depend on the facts and circumstances.” See Oversight of Credit Rating Agencies Registered as Nationally Recognized Statistical Rating Organizations, Exchange Act Release No. 55231 (February 2, 2007), 72 FR 6431 (February 9, 2007). Thereafter, when adopting final rules, the Commission stated it had determined not to define “reasonable fee” at that time in order to gain experience on the issue. See Oversight of Credit Rating Agencies Registered as Nationally Recognized Statistical Rating Organizations, Exchange Act Release No. 55857 (June 5, 2007), 72 FR 33564 (June 18, 2007).

*Recommendation 5: The Division of Trading and Markets (TM), in the consultation with the Office of Compliance Inspections and Examinations, the Office of Economic Analysis, and the Office of Risk Assessments, should request that the Office of General Counsel develop guidance regarding the types of deficiencies, (e.g. overly broad disclosures) that should prompt TM either to (1) seek consent from the applicant to waive the 90-day statutory time period for granting an application for registration as a Nationally Recognized Statistical Rating Organization (NRSRO), or (2) recommend instituting proceedings to determine whether registration should be denied.*

Management Response: TM will request that the Office of General Counsel provide such guidance.

*Recommendation 6: The Division of Trading and Markets and the Office of Compliance Inspections and Examinations should take appropriate actions to inform Nationally Recognized Statistical Rating Organizations about the Commission’s expectations regarding the expertise and experience of their compliance officers.*

Management Response: The Commission has not adopted rules, issued guidance, or taken other actions regarding the expertise of individuals designated by NRSROs as the compliance officer under Section 15E(j) of the Exchange Act (15 U.S.C. 780-7(j)). Further, there is no self-regulatory organization for NRSROs that could provide such guidance. TM, in consultation with OCIE (e.g., through its CCO Outreach Program), will take appropriate action to inform the NRSROs of the Commission’s expectations with respect to the NRSROs’ designated compliance officers should the Commission make them known through rules, guidance, or other Commission actions.

## Appendix V

***Recommendation 7:** The Division of Trading and Markets should ensure that it seeks Commission orders regarding Nationally Recognized Statistical Rating Organizations when required by statute or the Commission's rules.*

**Management Response:** TM has delegated authority to issue no-action guidance with respect to issues arising under the Securities Exchange Act of 1934, including provisions relating to NRSROs. TM will seek guidance from the Commission on how it would prefer to address routine requests for extensions of time to furnish Form NRSROs and the annual reports required pursuant to Rule 17g-3 (e.g., by the staff no-action process, exemptive authority delegated to TM, or by vote of the Commission).

***Recommendation 8:** The Division of Trading and Markets should ensure that credit rating agencies applying for designation as Nationally Recognized Statistical Rating Organizations (NRSROs) and firms that have registered as NRSROs comply with the Commission's rules and requirements regarding the filing and certification of financial information.*

**Management Response:** TM will take steps to strengthen its controls around the receipt of Form NRSROs and Rule 17g-3 Annual Reports. In cases where the forms or reports are determined to be incomplete or certified in a manner other than prescribed by rule, TM will request that the form or report be corrected and re-furnished.

***Recommendation 14:** The Division of Trading and Markets (TM), in consultation with the Office of Compliance Inspections and Examinations (OCIE), the Office of Economic Analysis, the Office of International Affairs, and the Office of Risk Assessment, should assess the impact of the provision of consulting and advisory services on the quality of credit ratings and how best to minimize the potential harmful effects, without unduly limiting competition among the Nationally Recognized Statistical Rating Organizations (NRSROs). If warranted by the results of OCIE's examination work and TM's analysis, TM should recommend that the Commission propose appropriate rules designed to prevent an NRSRO's consulting and advisory services from potentially adversely affecting the quality of the credit ratings.*

**Management Response:** If OCIE finds through the course of its examination work that, notwithstanding current Commission rules, there is evidence that the provision of consulting services by NRSROs is adversely impacting the integrity of their credit ratings, TM will analyze the evidence and, if appropriate and consistent with the Commission's

## Appendix V

authority, develop recommendations for the Commission that would be designed to address the problem. TM notes that the Commission has already adopted Rule 17g-5, which is designed to address conflicts of interest, including the conflict arising from the provision of consulting and advisory services.

*Recommendation 15: The Chairman, in concert with the other Commissioners, shall review the Office of Inspector General's findings on monitoring of credit ratings and as appropriate and as part of their broader analysis of issues pertaining to Nationally Recognized Statistical Rating Organizations (NRSROs), direct the Division of Trading and Markets (TM), in consultation with the Office of Compliance Inspections and Examinations, the Office of Economic Analysis, the Office of International Affairs (OIA), the Office of Risk Assessment, and the Office of General Counsel, to recommend appropriate rules to implement a comprehensive credit rating monitoring requirement for Nationally Recognized Statistical Rating Organizations (NRSROs). TM should also meet with OIA periodically (e.g., quarterly) to discuss the effects that any foreign laws or rules regarding credit rating monitoring are having, or may have, on the NRSROs.*

Management Response: With respect to the recommendation directed to TM, TM agrees to meet periodically with OIA to discuss the effects of foreign laws or rules regarding credit rating agencies. In addition, TM notes that a TM staff member currently chairs Standing Committee 6 of the Technical Committee of the International Organization of Securities Commissions ("IOSCO"). This committee, comprised of supervisors from jurisdictions in Europe, Asia and the Americas, has two primary responsibilities: (1) to discuss, evaluate and consider regulatory and policy initiatives vis-à-vis credit rating agency activities and oversight, in an effort to seek cross-border regulatory consensus through such means as the IOSCO credit rating agency code; and (2) to facilitate regular dialogue between securities regulators and the credit rating industry. TM believes this forum provides an additional opportunity to discuss the effect of foreign laws or rules.

*Recommendation 17: The Division of Trading and Markets (TM), in consultation with the Office of Compliance Inspections and Examinations (OCIE), the Office of International Affairs (OIA), and the Office of Risk Assessment, should assess the effects of undue influence on the quality of credit ratings and the potential benefits of a credit analyst rotating requirement. Depending on the results of OCIE's examination work and TM's analysis, TM should recommend rules to address the risk of undue influence. TM should meet with OIA periodically (e.g., quarterly) to discuss the effects that any foreign laws or rules on credit rating analyst rotation is having, or may have, on the Nationally*

## Appendix V

*Recognized Statistical Rating Organizations. If necessary, the Commission should seek legislative authority to implement the proposed rules designed to address the risk of undue influence.*

**Management Response:** If OCIE finds through the course of its examination work that, notwithstanding current Commission rules, there is evidence that the integrity of credit ratings is being adversely impacted by undue influence from issuers paying for credit ratings (or from any other sources), TM will analyze the evidence and, if appropriate and consistent with the Commission's authority, develop recommendations for the Commission that would be designed to address the problem. TM notes that the Commission already has adopted Rule 17g-5, which is designed to address conflicts of interest, including the conflict arising from the being paid by an issuer to determine a credit rating.

See TM's response to Recommendation 15 with respect to the recommendation above about the discussing the effects of foreign laws or rules.

***Recommendation 20:** The Division of Trading and Markets (TM), in consultation with the Office of Compliance Inspections and Examinations (OCIE), the Office of International Affairs (OIA), and the Office of Risk Assessment should assess the problems presented by the revolving door. Depending on the results of OCIE's examination work and TM's analysis, TM should (1) recommend rules to establish requirements to address the revolving door issue as it relates to Nationally Recognized Statistical Rating Organizations (NRSROs); and (2) meet with OIA periodically (e.g., quarterly) to discuss the effects that any foreign laws or rules designed to address the credit rating agency revolving door problem are having, or may have, on NRSROs. If necessary, the Commission should seek legislative authority to implement the proposed rules designed to address the revolving door issue.*

**Management Response:** If OCIE finds through the course of its examination work that, notwithstanding current Commission rules, there is evidence that the quality of credit ratings is being adversely impacted by the "revolving door," TM will analyze the evidence and, if appropriate and consistent with the Commission's authority, develop recommendations for the Commission that would be designed to address the problem. TM notes that the Commission already has adopted Rule 17g-5, which is designed to address conflicts of interest, including the conflict arising from the being paid by an issuer to determine a credit rating.

## Appendix V

See TM's response to Recommendation 15 with respect to the recommendation above about the discussing the effects of foreign laws or rules.

*Recommendation 24: The Division of Trading and Markets, in consultation with Office of Compliance Inspections and Examinations, the Office of Economic Analysis, the Office of Risk Assessment, should incorporate the additional concepts identified by the Office of the Inspector General's audit into the Commission's annual report to Congress on Nationally Recognized Statistical Rating Organizations.*

**Management Response:** TM believes the decision on whether to incorporate these concepts into the annual report to Congress rests with the Commission. TM notes that the matters to be addressed in the annual report are prescribed by Congress. Further, incorporating these additional concepts into the annual report would require a substantial re-allocation of staff resources from work that TM believes is a priority in terms of supporting the Commission's NRSRO oversight responsibilities.

\* \* \* \* \*

## APPENDIX II

**Legal Analysis of the Division of Trading and Markets Regarding the Decision of  
the Securities and Exchange Commission to Grant the Applications of the Credit  
Rating Agency Referenced in Finding 1**

**I. INTRODUCTION**

The Division of Trading and Markets (“TM”) respectfully submits the following analysis regarding a legal conclusion in Finding 1 of the report The SEC’s Role Regarding Oversight of NRSROs (the “IG Report”).<sup>212</sup> The legal conclusion related to the Commission’s decision to grant a credit rating agency referenced in Finding 1 (the “CRA”) registration as a nationally recognized statistical rating organization (“NRSRO”) and, subsequently, to grant the CRA registration in additional classes of credit ratings. In particular, the IG Report reaches the following conclusion:

Accordingly, our audit found that instead of issuing an order designating [the CRA] as an NRSRO, TM should have either recommended that the Commission institute proceedings to determine whether it should deny the applications or sought consent from the [CRA] to waive the 90-day statutory requirement to allow TM additional time to address the issues identified with the applications.

In order to resolve the issues identified by TM, the CRA would have needed to consent to a months-long extension of the 90-day period mandated by the Credit Rating Agency Reform Act of 2006 (the “Rating Agency Act”).<sup>213</sup> TM’s interactions with the CRA during the initial application process made clear that the CRA would not have consented to such an extension.<sup>214</sup> Consequently, the legal question is whether the

<sup>212</sup> TM notes that the analysis herein solely represents the views of TM and does not necessarily reflect the views of the Commission or other Divisions and Offices within the Commission.

<sup>213</sup> See Pub. L. No. 109-291 (2006). The Rating Agency Act, among other things, amended Section 3 of the Exchange Act (15 U.S.C. 78c) to add certain definitions, added Section 15E to the Securities Exchange Act of 1934 (“Exchange Act”) to implement a registration and oversight program for NRSROs (see 15 U.S.C. 78o-7), amended Section 17 of the Exchange Act to provide the Commission with recordkeeping, reporting, and examination authority over NRSROs (see 15 U.S.C. 78q), and amended Section 21B(a) of the Exchange Act to provide the Commission with authority to assess money penalties against NRSROs in proceedings instituted under Section 15E of the Exchange Act (see 15 U.S.C. 78u-2). Section 15E(a)(2)(A) requires the Commission to grant an application for registration as an NRSRO or commence proceedings on whether to deny the application within 90 days from the date the application is furnished to the Commission or a longer period if the applicant consents (15 U.S.C. 78o-7(a)(2)(A)).

<sup>214</sup> For example, at the time, the Commission was comprised of four commissioners. As of the 90-day deadline, three of the Commissioners had voted on the application. The remaining Commissioner

Commission should have instituted proceedings to determine whether the application should have been denied based on the information obtained during the application process.

As discussed below, TM believes the only legally viable option for the Commission was to grant the application. Specifically, the Commission is required to grant registration if an applicant “satisfies the requirements” of the Rating Agency Act by: (1) meeting the definition of “credit rating agency,”<sup>215</sup> and (2) submitting in its application for registration the information required by the Rating Agency Act.<sup>216</sup> In this instance, the CRA met the definition of “credit rating agency” and had submitted the information required by the Rating Agency Act. Thus, in order to deny the application for registration, the Commission would need to make substantial factual and legal findings (discussed below) and prevail in proceedings where the applicant had notice of the grounds for denial and an opportunity for a hearing.<sup>217</sup> The findings necessary to deny an application would be difficult to support without the benefit of an examination of the applicant and there is no express authority in the Rating Agency Act to examine an applicant prior to it being registered as an NRSRO. Finally, the concerns raised by TM were mostly qualitative in nature. Prior to the Rating Agency Act, the Commission staff identified credit rating agencies as NRSROs through a no-action letter process that included the staff examining the credit rating agency and making qualitative judgments about its operations. The Rating Agency Act’s over-arching goal, as indicated by its legislative history, is to increase competition in the credit rating industry by lowering the barriers to achieving NRSRO status. In this regard, the Rating Agency Act specifically targeted the staff no-action letter process as an anti-competitive barrier to achieving NRSRO status, including voiding the staff no-action letters. TM’s judgment was that the Commission would not have prevailed in proceedings to deny the application.

## II. THE INTENT OF THE RATING AGENCY ACT IS TO LOWER BARRIERS TO ACHIEVING NRSRO STATUS

Prior to enactment of the Rating Agency Act, the Commission staff identified NRSROs through the no-action letter process. Under this process, the Commission staff would perform examinations of a credit rating agency seeking to be identified as an NRSRO, including on-site inspections and reviews of the books and records of the credit

was unavailable to vote on the application on that day. Consequently, TM staff asked the CRA to consent to a two-day extension to allow the remaining Commissioner to vote. The CRA initially resisted granting the Commission the two-day extension. Ultimately, the CRA consented to the two-day extension but made clear that it would not consent to a longer time period.

<sup>215</sup> See 15 U.S.C. 78c(a)(61).

<sup>216</sup> See Sections 15E(a)(1)(A), (B) and (C) of the Exchange Act (15 U.S.C. 78o-7(a)(1)(A), (B), and (C)).

<sup>217</sup> Section 15E(a)(2) of the Exchange Act (15 U.S.C. 78o-7(a)(2)).



## Appendix V

rating agency. The Commission described this process in a 1997 proposal to define, by rule, the term “NRSRO”–

In determining whether a rating organization may be considered an NRSRO for purposes of the Commission's rules, the staff considers a number of criteria. The single most important criterion is that the rating organization is nationally recognized, which means the rating organization is recognized in the United States as an issuer of credible and reliable ratings by the predominant users of securities ratings. The Division [of Trading and Markets] also examines the operational capability and reliability of each rating organization in conjunction with this standard of national recognition. Included within this assessment are: (1) the organizational structure of the rating organization; (2) the rating organization's financial resources (to determine, among other things, whether it is able to operate independently of economic pressures or control from the companies it rates); (3) the size and quality of the rating organization's staff (to determine if the entity is capable of thoroughly and competently evaluating an issuer's credit); (4) the rating organization's independence from the companies it rates; (5) the rating organization's rating procedures (to determine whether it has systematic procedures designed to produce credible and accurate ratings); and (6) whether the rating organization has internal procedures to prevent the misuse of non-public information and whether those procedures are followed (emphasis added).<sup>218</sup>

In adopting the Rating Agency Act, Congress found the staff's approach to be an anti-competitive barrier to achieving NRSRO status. For example, the fifth finding in Section 2 of the Rating Agency Act states that “the 2 largest credit rating agencies serve the vast majority of the market, and additional competition is in the public interest.”<sup>219</sup> The Senate Report that accompanied the Rating Agency Act notes that the Department of Justice filed a comment letter stating that the Commission's 1997 proposal to define the term “NRSRO” (described above) would “likely create a nearly insurmountable barrier to new entry into the market for NRSRO services.”<sup>220</sup> The Senate Report further noted that witnesses testifying at hearings before the Senate Banking Committee stated, among other things, that the staff no-action letter process was “vague, arbitrary, and anti-competitive” and has served as “a substantial barrier to entry for new entrants and that

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<sup>218</sup> See Capital Requirements for Brokers or Dealers Under the Securities Exchange Act of 1934, Exchange Act Release No. 34-39457 (December 17, 1997).

<sup>219</sup> See Finding 5 in Section 2 of the Rating Agency Act.

<sup>220</sup> Report of the Senate Committee on Banking, Housing, and Urban Affairs to Accompany S. 3850, Credit Rating Agency Reform Act of 2006, S. Report No. 109-326, 109<sup>th</sup> Cong., 2d Sess. (Sept. 6, 2006) (“Senate Report”), p. 5.

## Appendix V

greater competition would benefit investors by generating more innovation and higher quality ratings at lower costs.”<sup>221</sup> In addition, the Senate Report noted that under the staff no-action letter process—

SEC commissioners are not formally involved in the decision whether to recognize new NRSROs. The most important requirement for acquiring the coveted status presents an obvious “Catch 22”: to get the designation you must be nationally recognized, but you cannot become nationally recognized without first having the designation.<sup>222</sup>

Finally, the Senate Report, in describing the purpose of the Rating Agency Act, stated—

The Credit Rating Agency Reform Act establishes fundamental reform and improvement of the designation process. Most importantly, the Act replaces the artificial barriers to entry created by the current SEC staff approval system with a transparent and voluntary registration system that favors no particular business model, thus encouraging purely statistical models to compete with the qualitative models of the dominant rating agencies and investor subscription-based models to compete with fee-based models. The Committee believes that eliminating the artificial barrier to entry will enhance competition and provide investors with more choices, higher quality ratings, and lower costs.<sup>223</sup>

The legislative history of the Rating Agency Act indicates that Congress intended to prescribe a process for achieving NRSRO status that was very different from the no-action letter process employed by the Commission staff. This Congressional intent to supplant the staff no-action letter process is hard-wired into the provisions of the Rating Agency Act. Specifically, the Rating Agency Act voided the staff no-action letters and mandated that a credit rating agency only could be registered as an NRSRO in accordance with the provisions of the Rating Agency Act.<sup>224</sup> In addition, under the Rating Agency Act, the determination of whether a credit rating agency should be granted NRSRO status no longer turns on an analysis of whether it is “nationally recognized,” which, under the old staff no-action letter process, meant that the staff had found the credit rating agency to be recognized in the United States as an issuer of credible and reliable ratings by the predominant users of securities ratings.<sup>225</sup> As the Commission stated in 1997, this was “the single most important criterion” under the staff

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<sup>221</sup> Senate Report, pp. 6-7.

<sup>222</sup> Id.

<sup>223</sup> Senate Report, p. 7.

<sup>224</sup> See Section 15E(I) of the Exchange Act (15 U.S.C. 78o-7(1)).

<sup>225</sup> See Capital Requirements for Brokers or Dealers Under the Securities Exchange Act of 1934, Exchange Act Release No. 34-39457 (December 17, 1997).

## Appendix V

no-action letter process.<sup>226</sup> Instead of a “national recognition” analysis by the Commission staff, the Rating Agency Act requires an applicant to submit certifications from 10 qualified institutional buyers (“QIBs”) stating that the entity meets the definition of a QIB and has used the credit ratings of the applicant for at least the 3 years immediately preceding the date of the certification.<sup>227</sup>

Moreover, as noted above, Section 15E(a)(2)(A) of the Exchange Act mandates that the Commission shall take action on an application within 90 calendar days of receipt of the application and provides that only the applicant can extend that time frame by consenting to a longer period.<sup>228</sup> Furthermore, the provisions of the Rating Agency Act provide no express authority for the Commission to examine an applicant’s books and records to verify whether information provided in an application is accurate or to investigate qualitative concerns. Even if there was such express authority, the 90-day deadline does not provide enough time for the Commission staff to review an application, determine whether there are issues that should be resolved, allocate staff to conduct an examination, conduct the examination to resolve the issues, develop a recommendation for the Commission, and circulate the recommendation to the Commission with enough time to allow it to review the staff’s recommendation and vote on the recommendation.

Further, Section 15E(a)(2)(C) of the Exchange Act provides that the Commission must grant an application for registration if the Commission finds that the requirements of Section 15E of the Exchange Act are satisfied.<sup>229</sup> The requirements of Section 15E of the Exchange Act are: (1) that the applicant be a “credit rating agency” as defined in Section 3(a)(61) of the Exchange Act,<sup>230</sup> and (2) that the applicant submit the information

<sup>226</sup>

Id.

<sup>227</sup>

See 15 U.S.C. 78o-7(a)(1)(B)(ix). Specifically, this provision requires the applicant to provide certifications from QIBs as specified in Section 15E(a)(1)(C) of the Exchange Act (15 U.S.C. 78o-7(a)(1)(C)). Sections 15E(a)(1)(C)(i) – (iii) of the Exchange Act require an applicant to furnish certifications from a minimum of 10 QIBs, including certifications from no less than two QIBs for each category of obligor for which the applicant intends to be registered. 15 U.S.C. 78o-7(a)(1)(C)(i) – (iii). Section 15E(a)(1)(C)(iv) requires that the certification state that the entity meets the definition of a QIB and has used the credit ratings of the applicant for at least the 3 years immediately preceding the date of the certification in the subject category or categories. 15 U.S.C. 78o-7(a)(1)(C)(iv). Section 15E(a)(1)(D) of the Exchange Act provides an exemption from furnishing the QIB certifications for any applicant that had received, or been the subject of, a no-action letter provided by Commission staff prior to August 2, 2006. 15 U.S.C. 78o-7(a)(1)(D). This indicates that the QIB requirement was designed to replace the staff’s “national recognition” analysis, since credit rating agencies that the staff had determined were nationally recognized under the no-action letter process did not need to submit the QIB certifications.

<sup>228</sup>

See 15 U.S.C. 78o-7(a)(2)(A).

<sup>229</sup>

15 U.S.C. 78o-7(a)(2)(C).

<sup>230</sup>

Section 15E(a)(1) of the Exchange Act provides, in pertinent part, that a “credit rating agency that elects to be treated as a nationally recognized statistical rating organization” shall furnish the Commission an application for registration. 15 U.S.C. 78o-7(a)(1). Consequently, an entity must

## Appendix V

prescribed in Section 15E(a)(1)(B) of the Exchange Act<sup>231</sup> in such form as the Commission shall require, by rule or regulation, pursuant to authority conferred in Section 15E(a)(1)(A) of the Exchange Act.<sup>232</sup> Thus, the Commission must find that an applicant has “satisfied” the requirements of Section 15E of the Exchange Act if the applicant is a “credit rating agency” as defined in Section 3(a)(61) of the Exchange Act and has submitted an application on a form prescribed by the Commission that contains the information required under Section 15E(a)(1)(B) of the Exchange Act. It should be noted that the finding necessary to grant a registration – that the requirements of Section 15E of the Exchange Act have been satisfied – does not require that the Commission find that doing so would “be necessary or appropriate in the public interest or for the

be a “credit rating agency” to apply for registration as an NRSRO. *Id.* Section 3(a)(61) of the Exchange Act (15 U.S.C. 78c(a)(61)) defines “credit rating agency” to mean “any person—  
(A) engaged in the business of issuing credit ratings on the Internet or through another readily accessible means, for free or for a reasonable fee, but does not include a commercial credit reporting company;  
(B) employing either a quantitative or qualitative model, or both, to determine credit ratings; and  
(C) receiving fees from either issuers, investors, or other market participants, or a combination thereof.” *Id.*

<sup>231</sup> 15 U.S.C. 78o-7(a)(1)(B). Under Section 15E(a)(1)(B), an applicant is required to submit the following information:

- (1) Credit ratings performance measurement statistics over short-, mid-, and long-term periods, as applicable;
- (2) The procedures and methodologies that the applicant uses in determining ratings;
- (3) Policies or procedures adopted and implemented by the applicant to prevent the misuse, in violation of the of the Exchange Act (or the rules and regulations hereunder) of material, nonpublic information;
- (4) The organizational structure of the applicant;
- (5) Whether or not the applicant has in effect a code of ethics, and if not, the reasons therefore;
- (6) Any conflict of interest relating to the issuance of credit ratings by the applicant;
- (7) The categories described in any of clauses (i) through (v) of Section 3(a)(62)(B) of the Exchange Act with respect to which the applicant intends to apply for registration under Section 15E of the Exchange Act (*i.e.*, the classes of obligors identified in the definition of “nationally recognized statistical rating organization”);
- (8) On a confidential basis, a list of the 20 largest issuers and subscribers that use the credit rating services of the applicant, by amount of net revenues received therefrom in the fiscal year immediately preceding the date of submission of the application;
- (9) On a confidential basis, as to each category of obligor described in clauses (i) through (v) of Section 3(a)(62)(B) of the Exchange Act, written certifications described in Section 15E(a)(1)(C) of the Exchange Act, except as provided in Section 15E(a)(1)(D) of the Exchange Act; and
- (10) any other information and documents concerning the applicant and any person associated with such applicant as the Commission, by rule, may prescribe as necessary or appropriate in the public interest or for the protection of investors.

<sup>232</sup> 15 U.S.C. 78o-7(a)(1)(A). The Commission adopted Rule 17g-1 (17 CFR 240.17g-1), which requires an applicant to submit this information using Form NRSRO. Form NRSRO is available at <http://www.sec.gov/divisions/marketreg/ratingagency.htm>.

## Appendix V

protection of investors” which is commonly required for Commission findings in other contexts, including other provisions of the Rating Agency Act. Congress mandated a different standard. Significantly, as noted above, Congress itself made the finding in the Rating Agency Act that increasing competition would be “in the public interest.”<sup>233</sup>

If an applicant satisfies the application requirements, the Commission can only deny the application if it can make at least one of two findings. The first finding, prescribed in Section 15E(a)(2)(C)(ii)(I) of the Exchange Act, is that the applicant does not have adequate financial and managerial resources to consistently produce credit ratings with integrity and to materially comply with the procedures and methodologies disclosed under paragraphs (1)(B) and with subsections (g), (h), (i) and (j) of Section 15E of the Exchange Act.<sup>234</sup> The second finding, prescribed in Section 15E(a)(2)(C)(ii)(II) of the Exchange Act, is that if the applicant were registered as an NRSRO, its registration would be subject to suspension or revocation under subsection (d) of Section 15E of the Exchange Act.<sup>235</sup> The Rating Agency Act and its legislative history provide no guidance on how the Commission should make either of the findings. For example, the Rating Agency Act and its legislative history do not identify factors the Commission should consider in analyzing whether an applicant has “adequate financial and managerial resources to consistently produce credit ratings with integrity” or the degree of misconduct that would support a finding that the applicant, if registered, would be subject to having its registration suspended or revoked under Section 15E(d) of the Exchange Act.<sup>236</sup> Moreover, given that the Commission cannot undertake an examination of the applicant as part of the application process, the Commission must largely rely on information provided in the application to analyze whether to institute proceedings to determine whether an application should be denied.

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<sup>233</sup> See Finding 5 in Section 2 of the Rating Agency Act.

<sup>234</sup> 15 U.S.C. 78o-7(a)(2)(C)(ii)(I).

<sup>235</sup> 15 U.S.C. 78o-7(a)(2)(C)(ii)(II).

<sup>236</sup> Section 15(d) of the Exchange Act provides that the Commission shall, by order, censure, place limitations on the activities, functions or operations of, suspend for a period not exceeding 12 months, or revoke the registration of an NRSRO if the NRSRO or an associated person: (1) has committed or omitted any act, or has been subject to an order or finding, enumerated in subparagraphs (A), (D), (E), (G), or (H) of section 15(b)(4) of the Exchange Act, has been convicted of any offense specified in section 15(b)(4)(B) of the Exchange Act, or has been enjoined from any action, conduct, or practice specified in section 15(b)(4)(C) of the Exchange Act; (2) has been convicted of any crime that is punishable by imprisonment for 1 or more years, and that is not described in section 15(b)(4) of the Exchange Act, or has been convicted of a substantially equivalent crime by a foreign court of competent jurisdiction; (3) is subject to any order of the Commission barring or suspending the right of the person to be associated with an NRSRO; (4) fails to furnish the certifications required under Section 15E(b)(2) of the Exchange Act (this section requires an NRSRO to annually certify a number matters); or (5) fails to maintain adequate financial and managerial resources to consistently produce credit ratings with integrity. 15 U.S.C. 78o-7(d).

Finally, the Rating Agency Act requires the Commission to submit an annual report to Congress that, among other things, identifies applicants for registration and specifies the number of, and actions taken on, such applications. In this way, Congress established a mechanism to monitor the extent to which the Commission was denying applications for NRSRO registration. Clearly, the denial of applications was a concern underlying the Rating Agency Act.

### III. THE APPLICATION OF THE CRA

Against the backdrop of the legislative history of the Rating Agency Act, TM reviewed the initial application of the CRA. Once TM's review was complete, it circulated an action memo to the Commission recommending that the Commission grant the registration because, based on information submitted by the applicant, it was a "credit rating agency" as defined in Section 3(a)(61) of the Exchange Act<sup>237</sup> and it had submitted the information required under Section 15E(a)(1)(B) of the Exchange Act<sup>238</sup> on Form NRSRO, including the 10 QIB certifications. However, in the memo, TM identified a number of issues that it believed should be made known to the Commission. It is important to note that these were the views of the staff and that they did not necessarily reflect the views of the Commissioners. The issues identified by the staff fell into two categories: factual concerns and qualitative concerns.<sup>239</sup>

There were two factual concerns raised by TM: (1) "suspicions about the accuracy of financial information provided by the CRA;" and (2) that the CRA initially submitted a number of QIB certifications that did not comply with provisions with the Rating Agency Act and that the process undertaken by the CRA to submit corrected QIB certifications raised questions about their authenticity. While noting reservations about the financial

<sup>237</sup> 15 U.S.C. 78c(a)(61).

<sup>238</sup> 15 U.S.C. 78o-7(a)(1)(B).

<sup>239</sup> In the memo to the Commission, TM also analyzed whether the Commission could find that the fees charged to subscribers by the CRA to access its credit ratings were reasonable. This analysis was not unique to this CRA but rather is undertaken each time a subscriber-paid credit rating agency applies for registration. Specifically, as noted above, Section 3(a)(61) of the Exchange Act defines a "credit rating agency" as, among other things, an entity that issues credit ratings for free or a reasonable fee (emphasis added). 15 U.S.C. 78c(a)(61). Consequently, for each NRSRO applicant that only makes its credit ratings available for a fee, TM engages in an analysis of whether the fee might be unreasonable in which case the entity would not meet the definition of "credit rating agency." *Id.* TM concluded that the Commission could grant the CRA's registration consistent with the definition of "credit rating agency" because the fees charged by the CRA appeared to be reasonable. The IG Report lists this analysis along with the factual and qualitative concerns raised by TM, all of which the IG Report characterizes as "significant issues" that should have been resolved before TM recommended the Commission grant the CRA's registration as an NRSRO. TM believes the IG Report should not include the fee analysis with the other concerns to make this argument because there was nothing about this CRA's fees that made them less reasonable than the fees charged by other subscriber-paid credit rating agencies.

## Appendix V

statements and QIB certifications, TM had no evidence to challenge the accuracy of the CRA's financial statements and no evidence other than the QIB certifications (correct and incorrect) to challenge their authenticity. As noted above, the Commission had no express authority (or time) under the provisions of the Rating Agency Act to perform an examination of the CRA to determine whether the facts surrounding these concerns would uncover an actual problem or a benign explanation.

TM raised five qualitative concerns to the Commission: (1) the CRA disclosed in Exhibit 9 to Form NRSRO that it had a part-time compliance officer who did not have experience as a credit rating analyst; (2) the CRA disclosed in Exhibit 1 rating transition matrices that showed high volatility in its ratings; (3) the CRA disclosed in Exhibit 2 a description of its rating processes that provided much less detail than other registered NRSROs; (4) the CRA disclosed in Exhibit 7 policies and procedures to manage conflicts of interest that "could be enhanced;" and (5) TM noted that certain required policies and procedures had been adopted only recently as part of the CRA's application process.

### IV. ANALYSIS

The question presented is: were the factual and qualitative concerns identified by TM of a nature that the Commission should have instituted a proceeding to determine whether registration should be denied? As discussed above, to deny the application, the Commission would need to find that: (1) that the CRA did not have adequate financial and managerial resources to consistently produce credit ratings with integrity and to materially comply with the procedures and methodologies disclosed under paragraphs (1)(B) and with subsections (g), (h), (i) and (j) of Section 15E of the Exchange Act; or (2) that if the applicant were so registered, its registration would be subject to suspension or revocation under subsection (d) of Section 15E of the Exchange Act. As discussed below, TM believes the factual and qualitative concerns raised by TM were not enough for the Commission to institute (and successfully litigate) a proceeding to deny the applicant's registration.<sup>240</sup>

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<sup>240</sup> Section 15E(a)(2)(B) of the Exchange Act prescribes the process for conducting a hearing to determine whether an application should be denied. 15 U.S.C. 78o-7(a)(2)(B). Under its provisions, the Commission must give notice of the grounds for the denial under consideration and an opportunity for a hearing. 15 U.S.C. 78o-7(a)(2)(B)(i)(I). The Commission must grant or deny the application at the conclusion of the proceedings. 15 U.S.C. 78o-7(a)(2)(B)(ii). Further, the Commission must conclude the proceeding within 120 days of receiving the application but can extend that time for 90 days if it finds good cause for the extension and publishes its reasons for so finding or for a longer period of time if the applicant consents. 15 U.S.C. 78o-7(a)(2)(B)(iii).

## Appendix V

### 1. Did the CRA have adequate financial and managerial resources?

As note above, the first finding to deny an NRSRO registration application is the prescribed in Section 15E(a)(2)(C)(ii)(I) of the Exchange Act.<sup>241</sup> Under this provision, the Commission would need to find and prove that the applicant does not have adequate financial and managerial resources to consistently produce credit ratings with integrity and to materially comply with the procedures and methodologies disclosed under paragraphs (1)(B) and with subsections (g), (h), (i) and (j) of Section 15E of the Exchange Act (the “adequate financial and managerial resources finding”).<sup>242</sup> With respect to the adequate financial and managerial resources finding, the information provided within the four corners of the CRA’s application indicated: (1) that the CRA had been determining credit ratings for an extended period of time; (2) that subscribers were willing to purchase access to these credit ratings as indicted by a consistent level of revenues reported on its financial statements for the previous three years; and (3) that 10 QIBs were willing to certify they had been using the credit ratings of the CRA for at least three years to make some investment decisions. This evidence weighs in favor of concluding that the CRA had adequate financial and managerial resources to consistently produce credit ratings with integrity and to materially comply with the procedures and methodologies disclosed under paragraphs (1)(B) and with subsections (g), (h), (i) and (j) of Section 15E of the Exchange Act.

While some of the factual and qualitative concerns were relevant to the finding, they were not dispositive of the question. Specifically, each could have had an innocent explanation or turn out to be immaterial to the question of whether the CRA had adequate financial and managerial resources. For example, the volatility of the CRA’s credit ratings noted by TM could be indicative of macro economic factors or unique attributes of the applicant’s methodologies and procedures for determining credit ratings (*i.e.*, not the result of a process that lacked integrity). Resolving the question would have necessitated a review of the firm’s procedures and methodologies for determining credit ratings and its books and records to determine whether the firm was following these procedures and methodologies or deviating from them for some improper purpose. This would entail substantial exam work.<sup>243</sup> The question is: does the Rating Agency Act

<sup>241</sup> 15 U.S.C. 78o-7(a)(2)(C)(ii)(I).

<sup>242</sup> *Id.*

<sup>243</sup> For example, staffs from TM, OCIE and the Office of Economic Analysis examined the practices of Fitch Ratings, Ltd., Moody’s Investor Services, Inc., and Standard & Poor’s Ratings Services to review their activities in rating structured finance products linked to subprime mortgages. See Summary Report of Issues Identified in the Commission Staff’s Examinations of Select Credit Rating Agencies, SEC Staff Report (July 2008). This examination included reviewing deal files to analyze whether the firms followed their documented procedures for determining credit ratings and whether the ratings were unduly influenced by conflicts of interest. *Id.* The examination work necessary to complete this review with respect to just one of the firms took many months and involved numerous Commission staff. See *Id.*



## Appendix V

contemplate this kind of review prior to registration? Put another way, would it have been appropriate for the Commission to institute proceedings to deny the application in order to resolve this factual question and the other concerns raised by the TM staff? In TM's judgment, the answer is "no" as such a process would be vulnerable to legal challenge as – in effect – returning to the prior staff no-action letter process. As indicated above, the unambiguous intent of the Rating Agency Act was to end such a pre-registration qualitative review by the staff and, thereby, lower the barriers to achieving NRSRO status.

In addition, the information underlying four of the five qualitative concerns was disclosed to the public in the CRA's Form NRSRO posted on its Internet web site as required by Rule 17g-1.<sup>244</sup> Form NRSRO and Exhibits 1 through 9 of the Form must be publicly disclosed by an NRSRO on its Web site within 10 business days of being registered.<sup>245</sup> The disclosure of the Form and Exhibits is designed to provide a mechanism for users of credit ratings and market observers to assess the relative quality of a particular NRSRO in terms of, among other things, its ratings performance statistics, procedures and methodologies for determining credit ratings, procedures for managing conflicts of interest, the educational requirements for its credit analysts, and the experience of its designated compliance officer. The disclosures allow users of credit ratings and market observers to make comparisons across NRSROs and reach their own conclusions about the adequacy of a given NRSRO's managerial resources and the quality of its methodologies, procedures and policies. As stated in the Senate Report –

Credit rating agencies that choose to register as NRSROs must disclose important information such as ratings performance, conflicts of interest, and the procedures for determining ratings. This information will facilitate informed decisions by giving investors the opportunity to compare ratings quality of different firms.<sup>246</sup>

Thus, the fact that the CRA provided a "much less detailed description" of its procedures for determining credit ratings in its public disclosure could cause investors and others not to use CRA's credit ratings. This is how Congress intended the Rating Agency Act to operate – allow market forces (as opposed to the Commission staff) decide which NRSROs perform best in determining accurate credit ratings.

Finally, with respect to the qualitative concerns, consideration must be given to the fact that the registration and oversight program established by the Rating Agency Act

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<sup>244</sup> 17 CFR 240.17g-1. The fifth qualitative concern was that TM noted that certain required policies and procedures had been adopted only recently as part of the CRA's application process.

<sup>245</sup> 17 CFR 240.17g-1(i).

<sup>246</sup> Senate Report, pp. 7-8.

## Appendix V

and the Commission's rules thereunder was brand new. There was no history of regulatory compliance with these statutory requirements and rules that could be used as a benchmark or template by applicants to refer to in preparing an application or by the Commission to evaluate whether an applicant had adequate financial or managerial resources. Consequently, TM provided the Commission with its qualitative views on the CRA's managerial resources and on its Form NRSRO disclosures, but could not conclude that they failed to satisfy the requirements of the Rating Agency Act. In addition, attention must be paid to the fact that the CRA was a small business and Congress enacted the Rating Agency Act to level the playing field for smaller credit rating agencies.

2. *If the CRA had been registered, would its registration have been subject to suspension or revocation under subsection (d) of Section 15E of the Exchange Act?*

As noted above, the second finding to deny an NRSRO registration is prescribed in Section 15E(a)(2)(C)(ii)(II) of the Exchange Act.<sup>247</sup> Under this provision, the Commission would need to find and prove that: if the applicant were registered as an NRSRO, its registration would be subject to suspension or revocation under subsection (d) of Section 15E of the Exchange Act (the "Section 15E(d) finding").<sup>248</sup> With respect to the Section 15E(d) finding, the CRA answered "no" to each question in Item 8 of Form NRSRO in both its initial registration application and its subsequent application to be registered in an additional class of credit ratings. This Item asks three questions about whether the applicant or an associated person: (1) has committed or omitted any act, or has been subject to an order or finding, enumerated in subparagraphs (A), (D), (E), (G), or (H) of section 15(b)(4) of the Exchange Act, has been convicted of any offense specified in section 15(b)(4)(B) of the Exchange Act, or has been enjoined from any action, conduct, or practice specified in section 15(b)(4)(C) of the Exchange Act; (2) has been convicted of any crime that is punishable by imprisonment for 1 or more years, and that is not described in section 15(b)(4) of the Exchange Act, or has been convicted of a substantially equivalent crime by a foreign court of competent jurisdiction; or (3) is subject to any order of the Commission barring or suspending the right of the person to be associated with an NRSRO.<sup>249</sup> These are the acts or omissions set forth in paragraphs (1), (2) and (3) of Section 15E(d) of the Exchange Act.<sup>250</sup> Consequently, based on the information provided in the application, the Commission had no basis to make a finding that the CRA, if registered, would be subject to having its registration suspended or revoked pursuant to these paragraphs of Section 15E(d) of the Exchange Act.

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<sup>247</sup> 15 U.S.C. 78o-7(a)(2)(C)(ii)(II).

<sup>248</sup> Id.

<sup>249</sup> Id.

<sup>250</sup> See 15 U.S.C. 78o-7(d)(1), (2) and (3).

## Appendix V

Paragraph (4) of Section 15E(d) of the Exchange Act provides that the Commission shall take one of the actions prescribed in Section 15E(d) of the Exchange Act if an NRSRO fails to furnish the certifications required under Section 15E(b)(2) of the Exchange Act.<sup>251</sup> Section 15E(b)(2) of the Exchange Act provides that an NRSRO must furnish to the Commission an annual certification in which it certifies, among other things, that the information and documents in its application continue to be accurate and listing any change that occurred to such information or documents during the previous calendar year.<sup>252</sup> Obviously, the Commission could not make a Section 15E(d) finding based on this provision with respect to the CRA's initial registration application as the CRA had not been required to furnish an annual certification at the time.<sup>253</sup>

Finally, paragraph (5) of Section 15E(d) of the Exchange Act provides that the Commission shall take one of the actions prescribed in Section 15E(d) of the Exchange Act if an NRSRO fails to maintain adequate financial and managerial resources to consistently produce credit ratings with integrity.<sup>254</sup> As discussed above, TM does not believe the factual and qualitative concerns could successfully support the adequate financial and managerial resources finding prescribed in Section 15E(a)(2)(C)(ii)(I) of the Exchange Act.<sup>255</sup> The finding required in Section 15E(a)(2)(C)(ii)(II) of the Exchange Act is that the applicant, if registered, would be subject to having its registration suspended or revoked because – with respect to paragraph (5) of the Section 15E(d) of the Exchange Act – it fails to maintain adequate financial and managerial resources to consistently produce credit ratings with integrity.<sup>256</sup> This would appear to be a tougher standard than the adequate financial and managerial resources finding prescribed in Section 15E(a)(2)(C)(ii)(I) of the Exchange Act<sup>257</sup> because the Commission would need to find not only that the NRSRO failed to maintain adequate financial and managerial resources but that its failure to do so was of such a degree that the Commission would revoke or suspend the registration of the NRSRO, if it were registered, as opposed to censuring, or placing limitations on the activities, functions, or operations of the NRSRO. In other words, the finding necessary to successfully deny a credit rating agency's application for registration prescribed in Section 15E(a)(2)(C)(ii)(II) of the Exchange Act is that the applicant's registration would be revoked or suspended if it were registered (*i.e.*, it does not include the lesser penalties of censure, or limiting the activities, functions or operations of the NRSRO as a basis for denying a registration).<sup>258</sup> This means Congress intended that the Commission not necessarily suspend or revoke the registration

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<sup>251</sup> 15 U.S.C. 78o-7(d)(4).

<sup>252</sup> See 15 U.S.C. 78o-7(b)(2)(A) and (B).

<sup>253</sup> As for the application to register for an additional class of credit ratings, the CRA had furnished the required annual certification so there was no basis for making the finding.

<sup>254</sup> 15 U.S.C. 78o-7(d)(5).

<sup>255</sup> 15 U.S.C. 78o-7(a)(2)(C)(ii)(I).

<sup>256</sup> 15 U.S.C. 78o-7(a)(2)(C)(ii)(II).

<sup>257</sup> 15 U.S.C. 78o-7(a)(2)(C)(ii)(I).

<sup>258</sup> See 15 U.S.C. 78o-7(a)(2)(C)(ii)(II).

## Appendix V

of an NRSRO that “fails to maintain adequate financial and managerial resources to consistently produce credit ratings with integrity” (i.e., that an appropriate sanction could be to censure or place limitations on the activities, functions or operations of the NRSRO).

At a minimum, this raises a question about whether there is an implicit “degree” test with respect to the adequate financial and managerial resources finding prescribed in Section 15E(a)(2)(C)(ii)(I) of the Exchange Act.<sup>259</sup> In other words, did Congress intend that an applicant not be granted registration if it fails to maintain adequate financial and managerial resources to consistently produce credit ratings with integrity under all circumstances, even though, after registration, an NRSRO could, in some cases, continue to operate as an NRSRO notwithstanding its failure to maintain adequate financial and managerial resources to consistently produce credit ratings with integrity. Alternatively, could the Commission grant an applicant’s registration as an NRSRO even though it fails to maintain adequate financial and managerial resources to consistently produce credit ratings with integrity, provided the appropriate sanction upon registration would not be suspension or revocation of the registration. Unfortunately, the Senate Report provides no guidance on this point.

### V. CONCLUSION

For all these reasons, it is the judgment of TM that the Commission made the appropriate decisions as a matter of law to grant the CRA’s applications. The factual and qualitative concerns identified to the Commission would not have successfully supported either of the findings necessary to deny an application for registration. Moreover, instituting proceedings based on these concerns ran a significant risk of being challenged as contravening the goal of the Rating Agency Act by, in effect, returning to the prior staff no-action letter process in which examinations were used to make qualitative assessments of a credit rating agency seeking to be identified as an NRSRO. Given the Rating Agency Act’s unambiguous intent to increase competition by lowering the barriers to achieving NRSRO status, TM believes the Commission took the soundest legal course in granting the CRA’s applications. The appropriate mechanism to address concerns identified by TM was through the Commission’s examination function under the Rating Agency Act, which was triggered once the applicant became registered as an NRSRO.

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<sup>259</sup> 15 U.S.C. 78o-7(a)(2)(C)(ii)(I).

## Comments from the Office of Compliance Inspections and Examinations

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### MEMORANDUM

TO: David Kotz  
Inspector General, Office of Inspector General

FROM: John Walsh  
Acting Director, Office of Compliance Inspections and Examinations

RE: OCIE Response to the Office of Inspector General Report No. 458, *The SEC's Role Regarding and Oversight of NRSROs*

DATE: August 25, 2009

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#### **I. Introduction**

The Office of Compliance Inspections and Examinations (“OCIE”) submits this memorandum in response to the Office of Inspector General’s (“OIG”) draft report entitled *The SEC’s Role Regarding and Oversight of NRSROs* (“Report”). Thank you for the opportunity to respond to the Report. Let me also express our appreciation for the professional courtesy extended by you and your staff during the audit.

You have requested that we indicate whether we “concur” or “non-concur” with each recommendation. In no case do we “non-concur.” However, several of the recommendations directed to OCIE will require the deployment of significant staff resources or the resolution of antecedent policy issues. In those cases we have indicated that we “do not object,” and describe the steps we will take to follow-up on your recommendation. Otherwise, we state that we “concur” and describe how we intend to implement your recommendation.

The Report also contains several recommendations directed to the Chairman, the Commissioners, and other Divisions or Offices, in which you state that the party to whom you direct your recommendation should consult with OCIE. We have not responded to these recommendations, but you should rest assured that we stand ready to consult with the Chairman, the Commissioners, and other Divisions and Offices and to assist them as they believe appropriate in responding to your recommendations.

Finally, we note that the Report contains non-public information. We request that all such information be redacted from the public version of the Report and have attached, under separate cover, a Memorandum outlining the items that we believe should be redacted.

## II. Background

OCIE is proud of the hard work and dedication shown by the Commission staff associated with rating agency oversight over the last several years. In response to the turmoil in the credit markets caused by the Subprime Crisis, former Chairman Cox directed Commission staff to initiate examinations of the three largest rating agencies. Because of the grave risk to the financial markets, these examinations were begun prior to the effective date of the rating agencies' registration with the Commission under the recently adopted NRSRO rules. Over 50 staff from OCIE, the Division of Trading and Markets, and the Office of Economic Analysis worked together to conduct these examinations. They rapidly reviewed hundreds of thousands of pages of documents and electronic communications, conducted interviews, and analyzed the factual record. A Public Report was issued less than a year later. The results of the examinations were significant, contributed to widespread compliance changes at the rating agencies, and helped inform new rulemaking by the Commission. We believe this experience demonstrates the agency's ability to quickly field teams drawn from different offices and divisions, to examine new and difficult areas of responsibility, and to prepare significant work product that has an important effect on the financial markets.

Then, in October 2008, OCIE was tasked with conducting regular examinations of registered NRSROs. Since that time we have been actively conducting examinations. In these examinations we have continued to work closely with staff from the Division of Trading and Markets, and other Divisions and Offices within the Commission.

More recently, as you note in your Report, Chairman Schapiro has assigned new resources to the oversight of rating agencies, including a Credit Ratings Branch in OCIE that will specialize in rating agency examinations. We are currently recruiting staff for this branch, and hope to retain staff with significant credit ratings expertise. We believe this new specialization will enhance even further our oversight of NRSROs.

## III. Recommendations Directed to OCIE

*Recommendation 6: The Division of Trading and Markets and the Office of Compliance Inspections and Examinations should take appropriate actions to inform Nationally Recognized Statistical Rating Organizations about the Commission's expectations regarding the experience of their compliance officers.*

## Appendix V

OCIE concurs with this Recommendation. We have implemented an active outreach program for compliance officers and compliance professionals, including national and regional *CCOutreach* programs. These outreach programs play a positive role in communicating the expectations of the Commission, and in enhancing the expertise and professionalism of the compliance community. We will undertake to extend this program to NRSRO compliance personnel.

***Recommendation 10:*** *The Office of Compliance Inspections and Examinations (OCIE) should include the Nationally Recognized Statistical Rating Organizations (NRSROs) in its pilot monitoring program. Given the different sizes (i.e., market dominance) of the various NRSROs and the current examination cycle, OCIE should specifically tailor its monitoring program for each particular NRSRO.*

OCIE does not object to this recommendation. The idea of using monitoring teams to enhance our oversight of NRSROs has merit and warrants careful inquiry. We have deployed pilot monitoring team programs to other types of registrants, and could do so for NRSROs as well. However, full implementation of the recommendation, a monitoring team for each NRSRO, would require substantial additional resources. In addition, we believe further work is needed to determine whether having a monitoring team for each NRSRO would have sufficient oversight value to warrant the necessary expenditure of resources. Therefore, to follow-up on this recommendation, we anticipate working with the Chairman's Office and the Division of Trading and Markets to establish a pilot monitoring program for selected NRSROs, with responsible staff drawn from either OCIE or the Division of Trading and Markets. After an appropriate period of experience with the pilot, we will formulate a recommendation to the Chairman as to whether the program should be extended to all NRSROs, and if so, the resources that would require.

***Recommendation 11:*** *The Office of Compliance Inspections and Examinations (OCIE), in consultation with the Ethics Office and the Office of Administrative Services, should obtain an additional review of the draft OCIE Nationally Recognized Statistical Rating Organization (NRSRO) examination module by an expert in credit rating and NRSRO matters.*

OCIE concurs with this recommendation. We are currently recruiting staff for OCIE's newly formed Credit Ratings Branch and hope to retain staff with significant credit ratings expertise. We plan to seek input from the newly hired staff on the substance of the NRSRO examination module.

***Recommendation 13:*** *The Office of Compliance Inspections and Examinations should perform examination work to determine whether the quality of credit ratings is being adversely affected by Nationally Recognized Statistical Rating Organizations (NRSROs)*

## Appendix V

*performing consulting and advisory services for issuers, underwriters or obligors that have paid the NRSROs for credit ratings.*

Please see our response to Recommendation 19.

***Recommendation 16:*** *The Office of Compliance Inspections and Examinations should perform examination work into whether, and under what circumstances, credit rating analysts face undue influence and the effects of such undue influence on the credit ratings issued by Nationally Recognized Statistical Rating Organizations.*

Please see our response to Recommendation 19.

***Recommendation 19:*** *The Office of Compliance Inspections and Examinations should conduct examinations to evaluate whether the revolving door problem is negatively impacting the quality of credit ratings.*

OCIE does not object to Recommendations 13, 16, and 19. In each of these recommendations, we understand that our examinations would be intended to assist the agency in formulating regulatory policy for NRSROs. We stand ready to assist the Chairman, the Commission, and the Division of Trading and Markets in their regulatory functions, but note that complying with these three recommendations would probably require us to conduct three separate sweep examinations of registered NRSROs. Sweep examinations are resource intensive and can be expected to require the analysis of voluminous internal records such as ratings files, policies and procedures, and e-mails. For example, our 2007-2008 examinations of three NRSROs, which focused solely on sub-prime ratings, required the participation of over 50 Commission staff. In short, conducting the recommended examinations could require additional staff, could be a multi-year endeavor, and could divert examination resources away from other compliance or policy areas that the Chairman or Commission have selected for immediate attention. To follow-up on your recommendations we anticipate working with the Chairman's Office and the Division of Trading and Markets, and will consider your recommendations when determining the appropriate priority and timing for possible sweep examinations involving NRSROs.



## Comments from the Office of International Affairs

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**TO:** Office of Inspector General

**FROM:** Office of the International Affairs

**DATE:** August 25, 2009

**RE:** OIA Comments on Draft Report on SEC Oversight of NRSROs

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Thank you for the opportunity to comment on the Inspector General's report, "The SEC's Role Regarding and Oversight of NRSROs" (IG Report). The Office of International Affairs (OIA) involvement with credit rating agency (CRA)-related issues to date has been with regard to OIA Director Ethiopis Tafara's previous chairmanship of the Credit Rating Agency Task Force (now the Credit Rating Agency Standing Committee) within the International Organization of Securities Commissions (IOSCO) and OIA's continuing monitoring and analysis of legislative and regulatory changes in foreign jurisdictions regarding CRA oversight. As part of this work, OIA was heavily involved in negotiating the IOSCO Code of Conduct Fundamentals for Credit Rating Agencies (IOSCO CRA Code), which was recently highlighted in the G-20 Communiqué as the international "baseline" consensus regarding CRA oversight. OIA is also currently involved in discussions with a number of the SEC's foreign counterparts on developing cross-border information-sharing and cooperation mechanisms that will allow for more effective oversight of those Nationally Recognized Statistical Rating Organizations (NRSROs) that operate across national borders.

Given OIA's work in this area, we support many of the Inspector General's recommendations, particularly with regard to foci for future NRSRO inspections. However, OIA would like to raise concerns about one section of the IG Report.

### ***Analyst Rotation***

Recommendations 16 and 17 of the IG Report deal with mandatory rotation of NRSRO analysts, a requirement currently contained under recently enacted European Union CRA regulation. While we agree with Recommendation 17 that the issue of a credit analyst's relationship with the issuers he or she analyzes is important and one that a regulator should review when overseeing an NRSRO, and while we agree that all policy proposals, including analyst rotation, deserve to be considered, we have doubts that the issues highlighted by the IG Report are addressed by mandatory analyst rotation.

## Appendix V

While often linked together even in some academic papers and foreign legislation as “gatekeepers,” the role of an independent auditor and a CRA is very different, and face correspondingly different conflicts of interest and transparency concerns. Auditors might be described as “backwards-focused,” in that they use audit standards set by the Public Company Accounting Oversight Board (PCAOB) to opine on statements that an issuer makes regarding historic facts. By contrast, CRAs are “forwards-focused,” using non-standardized and proprietary methodologies (which current legislation prohibits the SEC from regulating) to predict the likelihood of future events.

The role that a CRA analyst plays within a CRA is also quite different from the role a lead auditor or even an audit partner plays. A lead audit partner may be responsible for the fees collected from an issuer, and compensated accordingly. By contrast, NRSRO analysts are separated from all discussions regarding issuer fees and are not permitted to be compensated based on any fees collected from an issuer they study. Likewise, whereas an audit partner has significant control over the audit’s final conclusions, in most CRAs, the CRA analyst reports his or her analyses to a rating committee, which considers the information provided by the analyst and is responsible for assigning a final rating after a deliberation.

The Sarbanes-Oxley Act of 2002 prohibits a lead audit partner or a concurring audit partner from performing audit services for an issuer for more than five consecutive years. Likewise, SEC rules require periodic rotation for audit firm partners in charge of an audit engagement team and who have responsibility for significant decision-making regarding the audit (among other things). Neither the Sarbanes-Oxley Act nor the Commission’s own rules require rotation of the audit engagement teams.

Lead analysts at NRSROs are in many ways more like the members of an audit team than they are like lead auditors because analysts are not allowed to be involved in selling products or setting fees, and they are not compensated according to how much business is generated by a particular issuer they cover. However, their expertise takes time to develop and is uncommon. While there remains concerns about analysts “going native” vis-à-vis the industries they cover, this seems more plausible with new analysts, who will rely even more heavily on issuers for information regarding an industry of which they might have comparatively little understanding. For this reason, mandatory analyst rotation might actually undermine the independence of a CRA analyst. While there may be value to having new analysts take a “fresh look” at an issuer, this value is likely not tied to analyst independence and its effect on the quality of a rating is likely to be individual-specific.

Accordingly, while we support the IG Report’s recommendation that the Division of Trading and Markets should assess the degree of influence that credit analysts may face from issuers as part of the credit rating process, we have doubts regarding that part of the recommendation that suggests that Trading and Markets should focus exclusively on

## Appendix V

reviewing the potential benefits of an analyst rotation requirement when it is possible that other alternatives may address any problems that are found to exist.

## **Comments from the Office of Economic Analysis**

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OEA did not provide a formal comment memorandum, but stated in an e-mail dated August 19, 2009, that it concurs with all recommendations directed to OEA (numbers 2, 4, 5, 14, 15, 18, 22, 23 and 24).

## Office of Inspector General Response to Management's Comments

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We are pleased that of the OIG report's 24 recommendations, the Office of the Chairman and OCIE concurred with the 13 recommendations directed to these offices. We are also pleased that TM fully concurred with seven, and partially concurred with five, of the 13 recommendations directed to that Division. (Two recommendations, Recommendation 6 and Recommendation 15, were directed to both TM and another office.)

We acknowledge that the Commission has faced, and still faces, many challenges in its oversight of NRSROs, particularly in the wake of the recent financial crisis. We appreciate the increased focus Chairman Schapiro has placed on this issue, making improving the quality of credit ratings one of her priorities. We also appreciate the recent efforts of TM and OCIE staff to improve the Commission's NRSRO oversight by recommending new regulatory proposals and increasing examination efforts.

With respect to TM's partial concurrence with Recommendations 1 through 3, we appreciate TM's willingness to endeavor to resolve significant outstanding issues identified in the NRSRO application process. However, we disagree with TM's position that it appropriately recommended that the Commission grant one CRA's application for NRSRO registration, despite the numerous significant problems TM identified with the application. We believe that TM's view renders the statutory requirements for the Commission's granting a CRA's application for NRSRO registration meaningless. Under the approach adopted by TM, so long as an applicant meets the definition of a CRA and submits the required information in its application, the Commission has no choice but to approve the application and would never institute proceedings to determine whether registration should be denied, as contemplated by the Rating Agency Act. We hope that TM will reconsider its position and implement these recommendations in full.

Further, regarding Recommendations 4 and 7, we are pleased that TM has agreed to consult with or seek guidance from the Commission on these issues. Nonetheless, we believe that it is important that TM have some measures for determining the reasonableness of subscriber fees charged by CRAs and that NRSRO requests for extensions of time for filing forms and annual reports are

## Appendix VI

handled in accordance with statutory or regulatory requirements. We would hope, therefore, that these recommendations are fully implemented.

Finally, we are disappointed that TM has not concurred with Recommendation 24, which recommended that the Commission's annual report to Congress on NRSROs be expanded to include additional areas identified by the OIG. We believe that the additional issues identified by our review would make the annual reports more useful and informative to the Congress, investors and the general public. We believe that TM should reconsider its position and implement this recommendation.

## Audit Requests and Ideas

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The Office of Inspector General welcomes your input. If you would like to request an audit in the future or have an audit idea, please contact us at:

U.S. Securities and Exchange Commission  
Office of Inspector General  
Attn: Assistant Inspector General, Audits (Audit Requests/Ideas)  
100 F Street, N.E.  
Washington D.C. 20549-2736

Tel. #: 202-551-6061  
Fax #: 202-772-9265

Email: [oig@sec.gov](mailto:oig@sec.gov)

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To report fraud, waste, abuse, and mismanagement at SEC,  
contact the Office of Inspector General at:

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Private Equity and Principal Investing  
Current Market Practice, Risk Management & Capital Treatment

OPSRA – Cross Firm Project

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SECURITIES AND EXCHANGE COMMISSION  
Division of Market Regulation  
Office of Prudential Supervision and Risk Analysis  
100 F St., N.E.  
Washington, DC 20549

For Additional Information, Please Contact:

Kevin Silva	202.551.5546	<a href="mailto:SilvaK@sec.gov">SilvaK@sec.gov</a>
Steve Spurry	202.551.5547	<a href="mailto:SpurryS@sec.gov">SpurryS@sec.gov</a>
Heather Wong	202.551.5538	<a href="mailto:WongH@sec.gov">WongH@sec.gov</a>



# TABLE OF CONTENTS

## EXECUTIVE SUMMARY

Introduction and Scope of Review . . . . .	1
Key Findings . . . . .	3

## INDUSTRY OVERVIEW AND TRENDS

Industry Overview . . . . .	6
Size and Growth of the Private Equity Market . . . . .	7

## SUMMARY OF CSE PRINCIPAL INVESTING ACTIVITIES

Carrying Values by Investment Category . . . . .	9
--	---

## CONTROL AND RISK MANAGEMENT PRACTICES

Market Risk . . . . .	11
Valuation Policies and Control . . . . .	11
Liquidity Risk . . . . .	13

## REGULATORY CAPITAL

Capital Treatment . . . . .	14
Outstanding Issues and Sources of Variation . . . . .	15

## APPENDICES

Firm Specific Write-ups	
Bear Stearns . . . . .	18
Goldman Sachs . . . . .	27
Morgan Stanley . . . . .	33
Lehman Brothers . . . . .	45
Traditional Accounting Methods . . . . .	59

# EXECUTIVE SUMMARY

## Introduction and Scope of Review

OPSRA staff performed a review of the CSE firms' investment activities that could require banking book equity treatment for regulatory capital purposes because of longer holding periods, reduced liquidity, or other factors. We met with business and control personnel at each CSE to develop an understanding of 1) the relevant businesses and products, 2) how the risks inherent in these businesses are managed, and 3) the level of capital held against these investments. In addition to frequent discussions during regularly-scheduled monthly meetings, these interactions included one day on-site at each firm, and subsequent follow-up as needed.

Our intent was not to examine all trading activities in instruments that are less than highly liquid and/or with market risk characteristics that may not be well captured by value-at-risk techniques. The scope of such an exercise would include many businesses, some of which have been or will be discussed as part of other OPSRA projects—e.g., mortgage securitization activities (including retained interest in residual securities), hedge fund derivative products, etc. The focus of this review, rather, is on private equity and private equity-like investments.

For managing growth and liquidity, among other purposes, the CSE firms each utilize some method for decomposing their balance sheets. Through this process, each firm has a segment on the asset side of its balance sheet dubbed “Alternative Investments,” “Investments,” or “Principal Investments.” Broadly speaking, such segments are intended to encompass equity or equity-like investments in companies, funds, or other assets that are held with the intent to eventually monetize or exit the investment, but that cannot be exited in the short run.<sup>1</sup> Classifying assets along these lines, versus as “trading inventory” or “lending,” is not entirely straightforward. Distinguishing between “equity-like” investments and certain debt instruments requires some consideration, as does distinguishing between instruments that are less liquid versus those that cannot be exited, for example due to contractual terms.

We have included the following activities as part of our scope:

- Direct Private Equity Investments and Seed Capital in Internal Private Equity Funds
- Seed Capital in Other Internal Funds
  - Real Estate Funds
  - Mezzanine Funds
  - Hedge Funds (and Fund-of-funds)
  - Traditional/Mutual Funds
- Investments in Third Party Funds
- Direct Investments in Physical Assets and Real Estate for the Primary Purpose of Capital Appreciation
- Restricted Equity Positions and Private Investments in Public Companies (“PIPEs”)

The CSE firms manage various types of investment funds that accept money from outside investors, thus earning management and incentive (or performance) fees. “Seed capital” is

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<sup>1</sup> The CSE firms often like to describe their trading and securitization activities as being “moving, not storage” businesses. Principal Investing, on the other hand, is more akin to the storage business.

simply the equity the firms invest in funds alongside third party investors. Differentiating between “direct” private equity investments and private equity seed capital is only important in that some firms make private equity investments through businesses other than asset management or merchant banking, which may not be through a fund. Several CSEs also invest in third party hedge funds and private equity funds—activities motivated by various factors such as receiving a stake in the fund’s fee income, facilitating other business opportunities with the fund, etc. Separately, the firms sometimes invest directly in physical assets or property/real estate, such as power plants or golf courses. While the purchase of such assets may not initially represent an investment into an entity such as an operating company or fund, this activity can entail a private equity-like investment strategy. Finally, restricted equity and PIPE positions are investments in public companies that can not be sold or hedged.<sup>2</sup> At the CSEs, these positions often result from what were originally private equity investments, and are created as the company is taken public.

We did not include as part of this review positions held by distressed debt and similar proprietary trading desks. Such desks purchase debt or receivables of individual companies, or large portfolios of non-performing corporate or consumer loans. Despite being held in the trading division, such assets can trade with little frequency. In terms of ability to exit, these positions fall across a spectrum. For instance, desks do trade out of many distressed bond and bank loan positions. Meanwhile, positions in large portfolios of consumer receivables (e.g., credit card receivables) and impaired mortgages are typically held to maturity—i.e., the desk’s internal rate of return is realized completely through the underlying cash flows, rather than through asset sales. One CSE firm does include most of its positions in these portfolios of non-performing loans as investments internally, while others are applying similar regulatory capital treatment without assigning the investments classification.

Unlike other cross-firm reviews OPSRA has performed in the past (e.g., event-driven lending), principal investments are not originated from or owned by one central business unit at the CSEs. Furthermore, similar types of investments can be sourced from and/or housed in various businesses, spanning across Merchant Banking, Asset Management, Trading, and Investment Banking divisions. Firms also make “corporate” or “strategic” investments, for which P/L may not belong to one particular desk. Consequently, the risk management of principal investments can be quite decentralized throughout a CSE firm.

Some CSE principal investments are entered into for the primary purpose of achieving capital appreciation, while others are entered into primarily for other business facilitation or customer relationship purposes. Both types of investments are discussed herein. We do not discuss acquisitions done for the purpose of expanding the firms’ ongoing business operations—e.g., the purchase of a mortgage origination platform for vertically integrating a mortgage securitization business. While the distinction between these types of investments and those made for business facilitation purposes might not seem initially clear, the differentiating factor is the explicit intent to eventually exit or monetize the investment.

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<sup>2</sup> Restrictions concerning the hedging of restricted positions are privately negotiated. Generally speaking, for the purposes of this review we are interested in restricted positions that can not be hedged.

## Key Findings

### Business Overview

**The private equity market has experienced substantial growth over the past few years.**

Two common metrics used to gauge growth in the private equity market include (1) the total amount of uncalled capital outstanding and (2) the amount of new capital raised during a given period. From June of 2003 through June of 2006, the total amount of capital committed, but uncalled, increased substantially from \$473 billion in 2003 to \$607 billion in 2006.<sup>3</sup>

Additionally, private equity funds raised \$432 billion in new commitments during 2006, a 38% increase over 2005. Preliminary indications are that private equity funds raised \$88 billion in new commitments during the 1<sup>st</sup> quarter of 2007. [See Page 6 for additional detail.]

**Since 2005, there has been a noticeable trend toward increasingly large private equity funds.** This can easily be seen in buyout funds where there has been a substantial concentration of commitments in the five largest buyout funds, with the top three funds being considerably larger than even the fifth largest fund. The largest buyout fund is Goldman Sachs' GSCP VI at \$20 billion, with the third and fifth largest funds at \$15 billion and \$9 billion respectively. [See Page 7 for additional detail.]

**Similar to the rest of the principal investing market, the portfolios of CSE firms have increased dramatically.** From year-end 2005 through year-end 2006, total balance sheet amounts for principal investing at the CSE firms increased by 79% from \$21.7 billion in 2005 to \$38.7 billion in 2006. All areas of investment grew significantly with Goldman Sachs and Merrill Lynch experiencing the largest growth. [See Page 9 for additional detail.]

**Firm-by-Firm Growth in Principal Investing (Year-end 2005 to Year-end 2006)**

	<u>Bear</u>	<u>Goldman</u>	<u>Lehman</u>	<u>Morgan</u> <sup>1</sup>	<u>Merrill</u> <sup>2</sup>	<u>Total</u>
<i>(\$ Change, in millions)</i>						
Merchant Banking Fund Seed Capital	-\$4	\$1,734	\$1,179	\$286		\$3,195
Traditional and Hedge Fund Seed Capital	\$138	\$129	\$505	\$1,164	-\$237	\$1,699
Investments in Third Party Funds	\$228	\$252	\$323	-	\$1,337	\$2,140
Direct Investing/Other	-\$173	\$4,649	\$1	\$1,273	\$3,335	\$9,085
<b>Subtotal</b>	<b>\$189</b>	<b>\$6,764</b>	<b>\$2,008</b>	<b>\$2,722</b>	<b>\$4,435</b>	<b>\$16,119</b>
<i>(% Change)</i>						
Merchant Banking Fund Seed Capital	0%	72%	118%	53%		67%
Traditional and Hedge Fund Seed Capital	60%	97%	204%	469%	-100%	155%
Investments in Third Party Funds	84%	231%	99%	-	83%	92%
Direct Investing/Other	-39%	96%	1%	69%	62%	72%
<b>Subtotal</b>	<b>11%</b>	<b>90%</b>	<b>117%</b>	<b>104%</b>	<b>61%</b>	<b>77%</b>

Notes:

<sup>1</sup> Data for Morgan investments in third party funds are not separately available for 2005. These amounts are therefore included in the other three investment categories. For November 2006, total third party fund investments were \$269 million.

<sup>2</sup> Merrill currently manages no traditional funds or hedge funds, due to the merger of Merrill Lynch Investment Management (MLIM) with Blackstone in 2006.

### **Additional CSE Firm Trends:**

- Of the five CSEs, Goldman Sachs has invested the most seed capital into internally managed merchant banking funds (\$4.15 billion currently).

<sup>3</sup> Private Equity Intelligence Ltd., "The 2007 Global Fundraising Review"

- The most recent Goldman Sachs buyout fund, GSCP VI, which closed fundraising in 2007, is a \$20 billion fund, making it the largest in the world.
- From the inception of the business through 2006, Goldman has raised over \$22 billion in investor capital through the real estate segment of its merchant banking division.
- Morgan Stanley is the largest manager of institutional real estate funds, with nearly \$50 billion in AUM in 2006. However, Morgan's own investment in these funds as of year-end 2006 was only \$608 million.
- Merrill Lynch is the only CSE firm that does not currently manage any sort of institutional merchant banking funds.
- Merrill Lynch is a very active investor in third party hedge funds, with \$4.2 billion invested as of year-end 2006. These investments are motivated primarily by the goal of building the overall relationships with the funds, and to a lesser extent as a means of generating fee revenue (as Merrill distributes some of these hedge fund products to its high net worth and institutional investor customers).
- With respect to overall growth, Goldman has basically doubled in size while other CSE firms, such as Lehman and Merrill, have flagged Principal Investing as a primary growth area.

[See Page 9 and Appendices A – F for additional detail on firm specific trends.]

### Risk Management

**Market risk management does not play as large a role in private equity and principal investment as it does for other products.** This is because these investments are not complex like derivative or other fixed income portfolios in that they do not involve complicated payoffs or explicit exposure to complex combinations of market risk factors. Furthermore, compared to other trading businesses, principal investing risk profiles evolve rather slowly over time, there are relatively few positions, and the valuations of the positions change infrequently. Consequently, the performance of detailed deal-by-deal due diligence, and committee approval serve as the key risk controls in this space. [See Page 11 for additional detail.]

**Similar to market risk management, liquidity risk management is also fairly straightforward.** Principal investments, which can not be financed in secured debt markets, are funded 100% with long-term cash capital at the CSE firms. That is, these positions are funded with some combination of equity and long-term debt, which is generally defined as debt with a maturity of one year or greater. [See Page 13 for additional detail.]

### Regulatory Capital

**The Basel Standard and the U.S. Notice of Public Rule making (“NPR”) provide less than full clarity on the capital treatment for private equity and principal investing.** The three main issues are (1) which risk-weight to apply to assets when using the simple risk-weight approach—both documents discuss the application of 100%, 150%, 300%, or 400% risk-weights, under various scenarios, with wide latitude for exceptions; (2) whether or not to apply a 10% materiality threshold, with little guidance on how to apply the threshold; and (3) whether a ten-year transition period should apply, which can result in a 100% risk-weight being applied. The ten-year transition period is discussed in Basel II and was in an Advance NPR, but was not mentioned in the final NPR. Additional areas needing clarification include how to treat

unfunded commitments and whether or not traditional funds (e.g., mutual funds) should receive the same capital treatment as private equity funds. [See Page 14 for additional detail.]

**The lack of clarity in the Basel Standard and U.S. NPR has led to various interpretations by the CSE firms.** As a result, some firms, due to the 10% threshold or “grandfather clause,” apply 100% to risk-weighted assets (“RWA”) resulting in 8% capital, while others apply higher risk-weights, resulting in higher capital charges. The table below summarizes the CSE firms’ current regulatory capital treatment of investments. [See Page 14 for additional detail]

	10% Threshold	Grandfathering	Risk-Weighted Assets (RWA)				Total RWA	Total Capital Charge
			100%	150%	250%	300%/400% <sup>1</sup>		
<b>Bear Stearns</b>	Yes	No	Positions below 10% threshold			Positions above 10% threshold	100%	8%
<b>Goldman Sachs</b>	No	Yes	Merchant Banking, Asset Mgmt, Sumitomo, ICBC		Trading Division Principal Investments		273% <sup>2</sup>	22%
<b>Lehman Brothers</b>	No	Yes	Positions held prior to CSE approval			Investments made after CSE approval	230%	18%
<b>Merrill Lynch</b>	No	Yes	"Non-equity" principal investments	"Equity-like" principal investments			146% <sup>3</sup>	12%
<b>Morgan Stanley</b>	Yes	No	Positions below 10% threshold			Positions above 10% threshold	100%	8%

Notes:

<sup>1</sup> A 300% risk-weight is used for publicly traded equity investments and 400% is used for all other equity investments.

<sup>2</sup> Goldman's total RWA is 273% despite the firm's application of 100% or 250% RWA due to the deduction of \$980 million from regulatory capital on several consolidated hard assets and equity method investments. Removing this \$980 million deduction from total regulatory capital results in Total RWA of 190% and a Total Capital Charge of 15%.

<sup>3</sup> Merrill's total RWA is 146% despite the firm's application of 150% RWA to the majority of its positions due to the fact that the firm is applying VaR (plus specific risk) or the PD/LGD approach to \$1.85 billion in positions.

**As part of the holistic trading book review, OPSRA plans to improve consistency of regulatory capital treatment for principal investing.** The current proposal being discussed with the firms is to use a 300% risk-weight for all new private equity and principal investment positions, while eliminating the use of the 10% threshold and ten-year transition period. In addition, we propose using a 300% risk-weight for unfunded commitments to invest, while applying a 50% conversion factor. Positions already on the books would continue to receive their current capital treatment. CSE firms may be allowed to use the look-through approach for traditional funds (e.g., mutual funds).

## PRIVATE EQUITY INDUSTRY OVERVIEW AND TRENDS

Private equity could be defined purely as direct equity investments in private corporations. However, there is a wider range of activities that requires consideration. Organizationally, some combination of private equity funds, real estate funds, and mezzanine funds can form one business unit within a CSE's fund management businesses, while hedge funds, hedge fund-of-funds, and traditional funds constitute another business. The former business would typically be dubbed "Merchant Banking," with the second group representing "Asset Management." While this structure is not universal, it is helpful to think of the fund management activities along these two broad lines. The underlying investments of merchant banking funds are, generally speaking, less liquid or illiquid, and entail long investment horizons.<sup>4</sup> In the remainder of this section, some background information on merchant banking activities is provided, including recent industry trends.

Again, major asset classes within merchant banking include private equity funds, real estate funds, and mezzanine funds. As the name would imply, private equity firms, also referred to as "financial sponsors," take minority and majority equity stakes in private companies, or take public companies private via leveraged buyouts ("LBOs"). Real estate funds invest in real estate assets, taking equity positions as well as financing assets. Mezzanine funds invest primarily in corporate debt instruments, typically in private companies. Such funds can take positions across the corporate capital structure (i.e., loans, bonds, equity)—often investing in subordinated debt instruments that contain equity-like features in terms of the economic upside (e.g., convertible into equity). These three asset classes can be further sub-classified. For instance, one could differentiate between the LBO funds that invest in larger, mature corporations, and venture capital funds, which invest in small start-up companies. Furthermore, there are "infrastructure" funds, which invest in public infrastructure assets such as toll roads or broadcasting towers (two CSE firms are currently managing infrastructure funds). For the remainder of this section, all of these various fund types are referred to collectively as "private equity funds."

Private equity funds are often organized as limited partnerships, with the private equity firm acting as the "general partner," making all investment decisions and managing the portfolio of investment companies over time. Only certain investors—namely institutional investors such as endowments, pension funds, banks, and wealthy individuals—are qualified to invest in these funds. These outside investors are the funds' "limited partners." A distinguishing characteristic between private equity funds and other funds, such as mutual funds or hedge funds, is that private equity investor "commitments" are not funded upfront. Rather, as the general partner identifies investment opportunities over time, it makes "capital calls" to each limited partner.

The life of private equity funds can extend to up to ten years. Individual target investment horizons vary, and are often in excess of three to five years. Private equity firms exit or realize cash proceeds from their equity investments in several ways. Namely, the general partner takes the companies public via an IPO, its sells the company (or other asset) to a "strategic" (or corporate) buyer, or it sells the company to another "financial" buyer (or investor). The general partners also take money out of their investments over time via dividends, which are often funded with additional debt—referred to as "dividend recapitalization." Historically, limited

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<sup>4</sup> While Asset Management funds often invest in quite liquid assets, the seed capital invested by the CSEs in such funds is also included in this report due to the CSE firms' inability to immediately withdraw their investments.

partnership interests have not been tradable (i.e., have been considered highly illiquid). More recently, however, several large financial sponsors have announced plans to take their companies public (the private equity company, as opposed to one of its portfolio companies), and at least one financial institution has conveyed plans to create a platform to allow for secondary trading in these limited partnerships.

General partners typically charge the limited partners two types of fees. The first is a management fee, which is a fixed percentage of the fund's total equity capital, or commitments. The second is a performance fee or "carry," which is based on the returns it generates. Typically, management fees charged are in the range of 1% to 2%, and performance fees are around 20% of profits above some minimum hurdle rate. In addition to the fees charged to investors, financial sponsors also charge fees to their portfolio companies, such as transaction fees.

### Size and Growth of the Private Equity Market

Over the past several years, the size of the private equity market has increased substantially. Two common metrics used to monitor growth include (1) the total amount of uncalled capital (i.e., the amount committed by limited partners, but not yet called by general partners) and (2) the amount of fund raising (i.e., the amount of new capital raised) during a given period.

Beginning in 2001 and continuing through most of 2003, both the total amount of uncalled capital and the amount of new capital raised declined. However, since June of 2003 through June of 2006, the total amount of capital committed, but uncalled, increased substantially from \$473 billion to \$607 billion.<sup>5</sup> Fundraising also increased dramatically over the past couple of years. During 2006, private equity funds raised \$432 billion in commitments, which was a 38% increase over 2005. The \$432 billion was raised by 684 new funds with the largest portion of commitments, \$212 billion, being raised by buyout funds (up 45% from 2005). Other growth areas for 2006 included real estate funds which raised \$63 billion (up 30% from 2005), mezzanine funds which raised \$19 billion (up 69% from 2005), and infrastructure funds which raised \$12 billion (more than double 2005's total). Distressed debt funds, fund-of-funds, and specialist secondary funds also raised significant amounts of capital—\$48 billion total in 2006. The only major fund type where fund raising was lower in 2006 than in 2005 was venture capital, which raised \$44 billion in 2006 (10% lower than capital raised in 2005).

Through the first quarter of 2007, preliminary indications are that private equity funds raised \$88 billion globally broken out as follows:

- Buyout funds - \$44 billion
- Distressed debt funds - \$9.3 billion
- Real estate funds - \$8.5 billion
- Venture capital funds - \$8 billion
- Secondary funds - \$6 billion
- Fund-of-funds - \$4.6 billion

Furthermore, there was a noticeable trend toward creation of larger funds in 2005 which continued through 2006 and into 2007. The table below clearly shows that there is a substantial

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<sup>5</sup> Private Equity Intelligence Ltd., "The 2007 Global Fundraising Review"

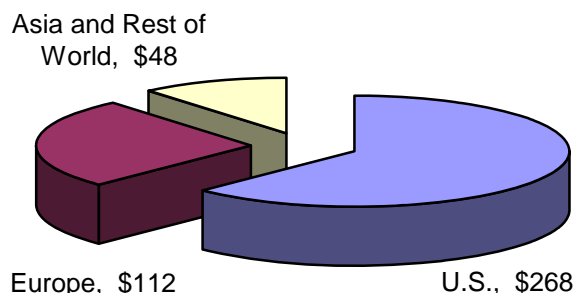


concentration of commitments in the five largest buyout funds, and that the top three funds are considerably larger than even the fifth largest fund. This trend is expected to continue through 2007.

<u>Fund</u>	<u>Fund Size (in millions)</u>
Goldman Sachs Capital Partners VI	20,000 USD
KKR Fund 2006	16,625 USD
Carlyle Partners V	15,000 USD
Apax Europe VII	8,500 EUR
Thoma H Lee VI	9,000 USD

In terms of the regional split of fundraising, \$268 billion (or 63%) of funds raised in 2006 were in the United States. European funds accounted for \$112 billion (or 26%) of the global total, and funds focused on Asia and the rest of world account for the remaining \$48 billion (or 11%).

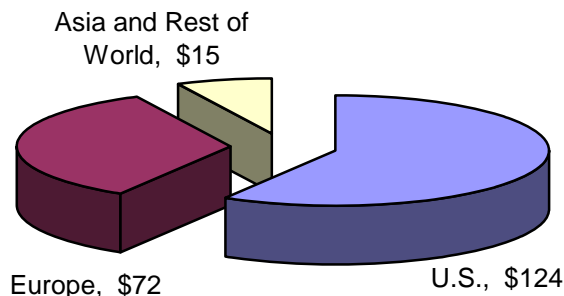
**Global Fundraising in 2006  
(by Region, \$ in billions)**



Through the first quarter of 2007, the regional breakout for fundraising in the U.S., Europe, and Asia and the rest of the world was similar to 2006 at 63%, 26% and 11% respectively. Approximately \$55 billion of the \$88 billion in total private equity fund commitments were raised by funds focusing on the U.S. market. Funds with a European focus raised \$23 billion while funds focused on Asia and the rest of the world raised approximately \$10 billion.

*Buyout funds* – Of the \$212 billion raised by buyout funds in 2006, \$124 billion (or 59%) was raised by private equity fund managers located in the U.S. while \$72 billion (or 34%) was raised in Europe and \$15 billion (or 7%) in Asia and the rest of the world.

**Value of Buyout Funds Raised in 2006  
(by Region, \$ in billions)**



This trend continued into the first quarter of 2007 where 70% of the \$44 billion in commitments to buyout funds were raised in the United States while 20% were raised in Europe and 10% in Asia and the rest of the world.

The creation of larger buyout funds has coincided with a trend towards investments by private equity firms in larger companies. During OPSRA’s regularly scheduled monthly meetings, the CSE firms have continually reported ever larger commitments to finance LBOs made through their leveraged lending businesses (which are quite distinct from the merchant banks). Throughout 2006 and 2007, the pace of high profile buyouts of large public companies has been relentless. In addition, the CSEs continued to report buyouts occurring at ever larger leverage levels, fueled by high investor demand for non-investment grade corporate loans and bonds.

## CSE CARRYING VALUES BY INVESTMENT CATEGORY

Principal Investing carrying values are reported by broad investment types for the CSE firms for year-end 2005 and 2006 in Table 1 below:<sup>6</sup>

**Table 1: CSE Principal Investments (PI) Carrying Values By Investment Category<sup>1</sup>**  
**\$ are in Millions**  
**Q4 2005 and Q4 2006<sup>2</sup>**

	<u>Bear</u>	<u>Goldman</u>	<u>Lehman</u>	<u>Morgan<sup>6</sup></u>	<u>Merrill<sup>7</sup></u>
<b>2005</b>					
Merchant Banking Fund Seed Capital <sup>3</sup>	\$829	\$2,411	\$1,001	\$544	-
Traditional and Hedge Fund Seed Capital <sup>3</sup>	\$231	\$133	\$247	\$248	\$237
Investments in Third Party Funds	\$272	\$109	\$325	-	\$1,615
Direct Investing/Other <sup>4</sup>	\$444	\$4,832	\$144	\$1,835	\$5,422
<b>Subtotal</b>	<b>\$1,776</b>	<b>\$7,485</b>	<b>\$1,717</b>	<b>\$2,627</b>	<b>\$7,274</b>
Total Adjusted Assets <sup>5</sup>	\$184,791	\$431,385	\$254,540	\$502,494	\$425,510
Subtotal/Total Adjusted Assets	0.96%	1.74%	0.67%	0.52%	1.71%
<b>2006</b>					
Merchant Banking Fund Seed Capital <sup>3</sup>	\$825	\$4,145	\$2,180	\$830	-
Traditional and Hedge Fund Seed Capital <sup>3</sup>	\$369	\$262	\$752	\$1,412	\$0
Investments in Third Party Funds	\$500	\$361	\$648	-	\$2,952
Direct Investing/Other <sup>4</sup>	\$271	\$9,481	\$145	\$3,108	\$8,757
<b>Subtotal</b>	<b>\$1,965</b>	<b>\$14,249</b>	<b>\$3,725</b>	<b>\$5,349</b>	<b>\$11,709</b>
Total Adjusted Assets <sup>5</sup>	\$271,979	\$536,733	\$503,545	\$646,148	\$544,321
Subtotal/Total Adjusted Assets	0.72%	2.65%	0.74%	0.83%	2.15%

Notes:

<sup>1</sup> Unfunded commitments to invest are not included in this table, but are reported separately in Table 2 (Regulatory Capital Summary).

<sup>2</sup> For Merrill and Bear carrying values are reported as of December; for the other three CSE firms values are reported as of November.

<sup>3</sup> Investments are categorized by fund type versus by the business unit that manages the fund. For instance, \$85 million of Bear's \$825 million Merchant Banking seed capital is invested in funds that are managed by Bear Stearns Asset Management, as opposed to Bear Stearns Merchant Banking.

<sup>4</sup> Merchant Banking businesses at some CSEs make investments that are owned entirely by the CSE, as opposed to being held through a fund. Such investments are included in the Merchant Banking line above. For the purposes of this table, Direct Investing includes investments made outside of the (institutional) Merchant Banking businesses (e.g., investments made by the trading division).

<sup>5</sup> Adjusted to remove the balanced book. For Lehman Brothers and Morgan Stanley December numbers are used for 2005 (instead of November).

<sup>6</sup> Data for Morgan investments in third party funds are not separately available for 2005. These amounts are therefore included in the other three investment categories. For November 2006, total third party fund investments were \$269 million.

<sup>7</sup> Merrill currently manages no traditional funds or hedge funds, and in 2006, Merrill sold its MLIM business to Blackrock.

Of the five CSEs, Goldman Sachs has invested the most seed capital into internally managed merchant banking funds (\$4.15 billion currently). Goldman is by far the largest manager of institutional funds that invest in corporate assets. Between 1986 and 2006, the merchant bank raised nearly \$30 billion in investor equity through its private equity and mezzanine fund businesses. Furthermore, the most recent buyout fund, GSCP VI, which closed fundraising in 2007, is a \$20 billion fund. Separately, through 2006, Goldman raised over \$22 billion in investor capital through the real estate segment of its merchant banking business. Across all of the corporate and real estate funds launched to date, Goldman Sachs' commitments (or seed capital) have represented approximately 25% of total fund commitments.

<sup>6</sup> Each of the five CSE firms categorizes and reports its principal investment activities differently. OPSRA staff created the above broad categories for investment types in an attempt to make meaningful cross-firm comparisons. In doing so, some manipulation and interpretation of the data provided was required.

Morgan Stanley is the largest manager of institutional real estate funds, with nearly \$50 billion in AUM in 2006. However, Morgan's own investment in these funds as of year-end was only \$608 million. The firm currently has little presence in terms of managing other types of private equity funds (although it has more recently launched an infrastructure fund). Consequently, Morgan's total merchant banking seed capital was only \$830 million as of 2006, despite its large real estate presence.

Merrill Lynch is the only CSE firm that does not currently manage any sort of institutional merchant banking funds. In addition, Merrill currently has no money invested in internal traditional funds, which reflects the merger of Merrill Lynch Investment Management and Blackstone in 2006.

Bear Stearns has a merchant banking business that is focused almost exclusively on middle market corporate (equity) investments. This business has raised nearly \$5 billion to date, including Bear seed capital.

Lehman Brothers currently manages several types of institutional merchant banking funds, including funds pursuing real estate and various private equity strategies (including venture capital as well as LBO strategies).

As previously stated, the CSEs also make significant principal investments away from their merchant banking and asset management businesses. Much of this exposure is generated through desks that have been established as pure proprietary investing businesses—e.g., Morgan Stanley Principal Investments and Merrill Lynch Global Private Equity. However, investments can be sourced from a variety of businesses within a firm. More of the firm specific details are discussed in the Appendices; however, a few highlights are worth noting.

- External Funds: Merrill Lynch has been leading the recent growth in investing in external funds with Lehman following suit. Some firms (like Bear and Lehman) pursue this more for the purpose of acquiring a stake in the funds' fee income. At Merrill the motivation is more for facilitating other business with hedge funds.
- Overall Growth: Goldman's principal investing business has basically doubled in size in recent years, while senior management at Merrill and Lehman has flagged this as a primary growth area.

# CONTROL AND RISK MANAGEMENT PRACTICES

## **Market Risk**

Generally speaking, there is not a large role for the CSE firm independent market risk management groups in serving as a principal investments control function. These investments are not complex like derivative or other fixed income portfolios in the sense of involving complicated payoffs or involving explicit exposure to some complex combination of market risk factors. In other words, this is not an area where getting the risk measurement right is a particular point of concern. Furthermore, compared to other trading businesses, the principal investing risk profiles evolve rather slowly over time, there are relatively few positions, and the valuations of the positions do not frequently change.

Consequently, the performance of detailed deal-by-deal due diligence, and committee approval serve as the key controls in this space. The extent to which the monitoring and approval of investments is decentralized throughout the businesses, versus the existence of some centralized oversight by parent company senior management varies. For instance, at some firms transactional limits and portfolio investment guidelines are simply approved by senior management and delegated to particular businesses, while at other firms senior committees take a more active ongoing role. This is the case at Bear Stearns, where the Executive Committee, which is the senior-most decision making body at the firm, approves every investment made by Bear Stearns Merchant Banking funds that is greater than \$20 million. Meanwhile, investments made by the Goldman Sachs Principal Investment Area funds do not require approval by the Goldman Sachs Management Committee (although the Management Committee approves the investment guidelines, including diversification requirements, when the funds are launched). Furthermore, the structure of the various committees that have been established for approving investments varies. For instance, at Merrill Lynch separate firm-wide committees exist for approving private equity and hedge fund investments. The level of approval authority depends on the transaction size (e.g., generally, investments over \$50 million require department head approval and investments over \$125 million require CFO or CEO approval). More specific details are discussed for each firm in the Appendices.

## **Valuation Policies and Controls**

The CSEs use a variety of techniques in valuing illiquid principal investments, made either directly or through internally managed funds. Prior to 2007, only certain entities qualified for the fair value accounting treatment of such positions. Namely, there are separate accounting guidelines for investment vehicles that allowed the firms to fair value the investments made through merchant banking funds. For similar investments held elsewhere at the firms, three traditional techniques were used to account for investments made with the intent to hold for an extended period of time. These methods entail carrying investments either at historical cost or book value. The selection of a particular method largely depended on the percentage of ownership or economic interest in the company or asset of interest. The methods of choice are the consolidation method, the equity method, and the cost method. A summary of each is provided in Appendix F.

In 2006, the Financial Accounting Standards Board (“FASB”) issued two new statements that carried implications for the valuation of principal investments (among other assets). The first

statement—SFAS 157: the Fair Value Measurement—expands and clarifies the definition of fair value. In short, prior to this statement, marking an asset to fair value meant assessing the price to be paid today if the asset needed to be replaced. The new statement defines fair value as the asset’s exit price—i.e., the price that would be received if the asset was (hypothetically) sold today to a market participant, based on the assumptions that such market participants would make.<sup>7</sup> The second statement—SFAS 159: the Fair Value Option for Financial Assets and Financial Liabilities—allows firms to elect to apply fair value accounting to specified instruments. Under SFAS 159, investments that traditionally fell under the equity method or the cost method can now be fair valued if both SFAS 157 and SFAS 159 are adopted. Furthermore, the fair value option can be adopted on an investment by investment basis, regardless of whether past investments were elected for fair value. Once elected, the fair value option is irrevocable.

Estimating fair value for non-publicly traded investments tends to be fairly subjective in that there is a heavy reliance on management’s assumptions. The CSEs are generally fair valuing their investments by carrying the positions at cost for the first year, unless there is a material event, such as a subsequent round of financing in an investment company. After the first year, the firms may begin to apply techniques such as a discounted cash flow model, an earnings multiplier, or comparable company analysis (e.g., comparing to other acquisitions or the prices of similar public companies). To compensate for the illiquid nature of many of these investments, significant discounts may be applied to the resulting valuations, which can take into account investment horizons as well as the earnings/price volatility of the industry of a particular investment company. In valuing investments in third party funds, the CSEs rely upon the net asset values (“NAVs”) provided by those funds.

In addition to valuation, an accounting issue that arises in the fund management context is the recognition/treatment of fee income. With respect to performance fees generated through hedge funds and private equity funds, there is some variation amongst the CSEs. While the basic philosophy taken is to recognize fees as they are realized, the existence of so called “claw back” provisions in the fund fee structures requires some judgment. Such provisions may require fund managers to essentially return fees if future performance is poor. Thus, the question that arises is essentially how quickly to recognize fees. Most CSE firms recognize performance fees earned from hedge funds and fund-of-funds quarterly, while one waits until year-end to recognize all fees. For private equity funds, the firms use scenario analyses in informing the recognition of performance fees. Such exercises entail an assessment of the amount of fees that would be retained on realized investment proceeds, should existing fund investments perform poorly.

The fair value accounting statements (SFAS 157 and 159) also permit a fund to make assumptions regarding the future fees it expects to generate—allowing for more aggressive accounting treatments. However, no CSE firm has conveyed its intent to change their treatment of performance fees as a result of SFAS 157 and 159.

### Valuation Control

Most CSE Finance Departments price verify principal investments on a quarterly basis. Lehman is the exception, as it has a dedicated team, the Private Equity Valuation Committee, which verifies the investments on a monthly basis. The process of verifying valuations is based on the

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<sup>7</sup> Goldman’s adoption of SFAS 157 in Q1 of 2007 resulted in approximately \$500 million in mark-ups (or profit) on the firms Merchant Banking-related investments.

application of several techniques. These include comparisons from recent rounds of unrelated financing transactions approved at committees, operating and transaction multiples from market based analysis, discounted cash flow analysis, financial performance trends, and liquidity and recovery analysis. In addition to the role played by the independent controllers, the individual business units may utilize additional valuation control processes, such as requiring memos justifying valuation techniques, holding periodic meetings to review valuations, etc.

In addition to the valuation process, some CSEs periodically update senior committees on investments' performance. For instance, at Merrill, a memo is prepared to highlight an investment's performance to date, deviations from the initial business plan, and any issues that need to receive additional approval. The memo is presented to the investment committees on a quarterly basis and to the Board of Directors on a periodic basis. Similarly, at Bear Stearns the Executive Committee receives monthly reporting from a designated corporate accounting group on all alternative investments, which includes information on any changes to position values based on new investments, sale of existing investments, mark up/down of current investments, the businesses responsible for each investment, and year-to-date gains/losses.

### **Liquidity Risk Management**

Principal investments, which can not be financed in the secured debt markets, are funded 100% with long-term cash capital at the CSE firms. That is, the positions are funded with some combination of equity and long-term debt, which is generally defined as debt with a maturity of one year or greater. The exact combination of debt and equity used to fund a particular business or transaction depends on the particular economics involved. Also, while firms extend commitments to invest in the future (recall private equity commitments are not funded by investors upfront), treasurers explain that these capital calls can be seen coming weeks in advance. Furthermore, it typically takes years for a fund to become fully invested; thus, the capital calls are fairly spread out. Consequently, compared to the firms' corporate lending businesses, which extend loans to finance mergers as well as the acquisitions made by private equity firms, the liquidity risk management implications of the investment commitments are minor.

## REGULATORY CAPITAL TREATMENT

The results of the regulatory capital treatments currently applied by each CSE firm are summarized in Table 2 below:

**Table 2: CSE Principal Investments (PI) Regulatory Capital Summary, Q4 2006**  
\$ are in Millions

	Bear	Goldman	Lehman <sup>1</sup>	Morgan	Merrill
<b>Total PI Carrying Value (from Table 1)</b>	\$1,965	\$14,249	\$3,725	\$5,349	\$11,709
<b>PI Regulatory Capital</b>	\$157	\$3,109	\$686	\$428	\$1,366
<b>PI Regulatory Capital/Carrying Value</b>	8%	22%	18%	8%	12%
<b>PI RWA</b>	100%	273%	230%	100%	146%
<b>Unfunded Commitments to Invest</b>	\$708	\$6,358	\$1,040	\$1,218	\$1,698
<b>Commitments Regulatory Capital</b>	\$113	\$509	\$166	\$0	\$102
<b>Total Regulatory Capital with Commitments</b>	\$271	\$3,618	\$852	\$428	\$1,468

Notes:

<sup>1</sup> Lehman PI Regulatory Capital was calculated by deducting "Commitments Regulatory Capital," which was estimated, from total capital. Committed Regulatory Capital was estimated using a conversion factor of 50%, which was known, and an RWA of 400%, which was estimated. For unfunded commitments, the breakdown between 400%, 300%, and 100% RWA was unavailable.

Bear is currently using a consistent capital treatment for all investments. The method is to apply 100% RWA against all funded exposures that fall under the 10% Basel II capital materiality threshold,<sup>8</sup> and to apply either 300% or 400% RWA for exposures above the threshold. During 2006 the funded investments were below the 10% threshold. The firm has since exceeded 10% in 2007, and is applying the higher RWA accordingly. All commitments to invest receive a 50% conversion factor and are risk-weighted at 400%.

Goldman is currently applying two different capital treatments, depending on where exposures are generated. All seed capital investments, as well as the firm's outsized investments in Sumitomo and ICBC, are currently receiving 100% RWA treatment. Goldman is also applying 100% RWA to Merchant Banking commitments using a 100% conversion factor. Meanwhile, all principal investments made by the firm's trading (or securities) division are receiving 250% RWA. In addition, several securities division investments, which are being accounted for either according to the equity method or being fully consolidated (totaling \$980 million in carrying value), are being fully deducted from capital, which explains why the PI RWA in the table above is greater than 250%. Removing this \$980 million from regulatory capital results in a PI RWA of approximately 190% and a capital charge of 15%.

Lehman uses a "grandfathering" provision, making a clear distinction between principal investments made prior to November 30, 2005 (when the firm was approved as a CSE firm) and investments made after November 30, 2005. For pre-November 2005 investments, Lehman applies a 100% risk-weight to all principal investment assets. For post-November 2005

<sup>8</sup> Equity exposures of a bank are considered material if their aggregate value, excluding all legislative programmes, exceeds, on average over the prior year, 10% of the bank's Tier 1 plus Tier 2 capital. Furthermore, this materiality threshold is lowered to 5% of a bank's Tier 1 plus Tier 2 capital if the firm's equity portfolio consists of less than 10 individual holdings.

investments, the firm uses 300% risk-weighting for all direct public investments and 400% for all direct non-public investments. With respect to unfunded commitments to invest, Lehman applies a 50% credit conversion factor, and then applies the applicable risk weight as described above.

Morgan Stanley's regulatory capital treatment is similar to Bear's in that the firm applies a 100% risk-weight to all principal investments below the 10% materiality threshold, and applies a 300% or 400% risk-weight to assets in excess of the materiality threshold. Morgan is currently below the 10% threshold; therefore, the firm applies a 100% RWA to all investments resulting in an 8% capital charge. Additionally, Morgan is the only firm that is not applying capital charges to unfunded investment commitments. Unfunded ISG investments/private equity commitments totaled \$239 million and \$985 million as of May 31, 2007 and November 30, 2006, respectively.

Merrill Lynch does not utilize the 10% materiality threshold. The firm does, however, use the "Transition Period" (i.e., grandfather clause) mentioned below. As a result, the firm's regulatory capital treatment falls more in line with the "Standardized Approach" under Basel II where riskier equity investments, such as private equity, receive a 150% risk-weight. For non-equity principal investments, Merrill uses a variety of approaches including VaR plus a specific risk add-on for trading inventory; 100% RWA for "Other" hard assets (e.g., building, land, equipment, etc.); and a PD/LGD approach for certain portfolios of non-performing loans. As the data regarding the regulatory capital generated by Merrill's application of the VaR and PD/LGD methods were not available as of this report, the RWA of 126% reported for the portfolio is slightly understated (i.e., the true capital held is closer to 150% RWA). All commitments to invest receive a 50% conversion factor and are risk-weighted at 150%.

#### Outstanding Issues and Sources of Variation

With respect to capital treatment for private equity and principal investments, there are certain issues that lend themselves to interpretation, and thus can lead to inconsistencies in the CSE firms' capital treatments as detailed above. The largest issues involve the proper risk-weight to apply (e.g., 100%, 300%, or 400%), whether or not a materiality threshold should be applied when determining the risk weighting, and whether or not to use a transition period (i.e., ten year grandfather period) in applying the higher risk-weights to equity exposures.

*Risk-Weight Assets* – According to Basel II, there are two acceptable approaches for calculating risk-weighted assets for equity exposures not held in the trading book—(1) a market-based approach and (2) a PD/LGD approach. Under the market-based approach, institutions are permitted to calculate the minimum capital requirements for their banking book equity holdings using either a simple risk-weight method or an internal models method. CSE firms, with the exception of Merrill Lynch—which primarily uses a 150% risk-weight under the Standardized Approach—use the simple risk-weight method.

*Simple Risk-Weight Method* – Under the simple risk-weight method, a 300% risk-weight is applied to equity holdings that are publicly traded and a 400% risk-weight is to be applied to all other equity holdings; thus, resulting in 24% and 32% capital charges respectively. Prior to Basel II, equity exposures were risk-weighted at 100% resulting in an 8% capital charge. At first glance this seems like a fairly straightforward approach, but Basel II also discusses materiality



thresholds and grandfathering provisions, which has led to various levels of interpretation by the five CSE firms.

*Materiality Threshold* – Both Basel II and the September 25, 2006 Basel II Joint Notice of Proposed Rule Making (put out by the OCC, Federal Reserve, FDIC, and OTS) reference materiality thresholds that, when applied, result in a 100% risk weighting for a substantial portion of the CSE firms’ private equity and principal investment exposures. Basel II states that supervisors may exclude the equity exposures of a bank “from the IRB treatment” based on materiality. It is unclear whether or not the ability for supervisors to exclude equity exposures from the “IRB treatment” based on materiality also gives supervisors the ability to exclude equity exposures from the “simple risk-weight approach” used by some CSE firms. The current assumption is that this is the case, pending additional guidance.

*Transition Period* – Basel II discusses a ten year transition period for the treatment of equity exposures. An Advanced Notice of Proposed Rule making (“ANPR”) also mentioned the ten year transition period; however, the September 25, 2006 Final NPR was silent on the issue. Basel II states that, for a maximum of ten years, supervisors may exempt “from the IRB treatment” particular equity investments held at the time of the publication of this Framework. Again, it is unclear whether or not a supervisor’s ability to exempt particular equity investments from the “IRB treatment” also means that these positions can be exempted from the “simple risk-weight approach” used by some CSE firms. But this is generally assumed to be the case. Additionally, Basel II states that equity holdings covered by this transitional provision will be subject to the capital requirements of the standardized approach, which can be increased to 150% from 100% at the supervisor’s discretion. As previously mentioned, this is the approach Merrill Lynch uses for equity-like principal investments.

*Additional Issues* – CSE firms are also grappling with other regulatory capital issues including the treatment of “unfunded” private equity commitments and the treatment of mutual fund exposures. For off-balance sheet items, Basel II states that commitments with an original maturity up to one year and commitments with an original maturity over one year will receive a conversion factor of 20% and 50%, respectively. With respect to capital treatment for mutual funds, CSE firms contend that applying the same treatment to mutual funds as you would to private equity funds appears overly conservative. OPSRA has discussed applying a look-through approach or other alternative treatment for Traditional Funds.

As part of the holistic trading book review, OPSRA plans to improve consistency on regulatory capital treatment for principal investing. The currently proposal being discussed with the firms is to use a 300% risk-weight for all new private equity and principal investment positions, while eliminating the use of the 10% threshold and ten-year transition period. In addition, we propose using a 300% risk-weight for unfunded commitments to invest, while applying a 50% conversion factor. Positions already on the books would continue to receive their current capital treatment. CSE firms may be allowed to use the look-through approach for traditional funds (e.g., mutual funds).

# APPENDICES

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17

## APPENDIX A: BEAR STEARNS

### A. Overview of Activities and Senior Governance

Internally, Bear uses the term “alternative investments” to classify what are usually equity investments that cannot be immediately liquidated (i.e., the positions that “look more like storage than moving”). Each of Bear’s alternative investments is attributed to one of six main business unit related categories: 1) Merchant Banking, 2) Asset Management, 3) Energy, 4) Investment Banking (IB) Related, 5) Strategic, and 6) Other.

The Merchant Banking business manages private equity funds that Bear, Bear employees, and third parties invest in. Similarly, Asset Management manages traditional funds (money market and mutual funds), hedge funds and fund-of-funds, its own private equity funds and fund-of-funds, and also invests in third party funds. The “Energy” category represents Bear’s Arroyo Energy Investors business, which invests in power plants and power purchase agreements. IB Related investments are in third party private equity and real estate funds.<sup>9</sup> Strategic Investments are made for the primary purpose of enhancing the firm’s existing businesses/franchise, rather than for their expected capital appreciation on a stand-alone basis. These investments are not sourced from any single business unit. Finally, the “Other” category includes those investments which do not fall neatly into any of the other categories

The total carrying value of Bear’s funded alternative investments as of December 2006 was \$1.965 billion.<sup>10</sup> The firm also had another \$708.4 million in outstanding commitments to invest. The December 2006 breakdown of funded investments by the categories above is<sup>11</sup>:

Merchant Banking -	\$740 million
Asset Management -	\$613 million
Strategic, IB Related, and Other -	\$454 million
Energy -	<u>\$158 million</u>
	\$1.965 billion

The total carrying value of all funded alternative investments has gradually increased from around \$600 million in 2001 to the \$1.965 billion in 2006. Bear has data available for the above categories starting Q2-05; since then the combined Merchant Banking and Asset Management categories have comprised greater than 50% of total Alternative Investments.

Provided below is a discussion of the types of investments comprising the major categories, as well as the management of those exposures within the businesses. However, Bear’s senior management also plays an overarching role in the management of alternative investments. Namely, the Executive Committee, which is the senior most decision making body at the firm,

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<sup>9</sup> IB related investments are done for a combination of capital appreciation and customer relationship purposes. The total carrying value for these as of December was only \$138.7 million across 28 funds, and the funds are actually administered by Asset Management for IB. We therefore do not discuss this activity separately.

<sup>10</sup> This total includes approximately \$200 million in funded leverage extended by Bear to employees invested in the Merchant Banking funds. This activity is unique to Bear, and is discussed further below.

<sup>11</sup> Note the categories reported here are different than in the Executive Summary. As previously noted, for the summary OPRSA sought to create categories based on investment type that could be used across the five CSE firms.

approves all firm investments greater than \$20 million, reviewing detailed memo and/or presentations of the investments in the process, meeting with new fund managers, etc.<sup>12</sup>

The Executive Committee as well as Risk Management receives monthly reporting from a designated corporate accounting group on all alternative investments, which includes information on any changes to position and/or carrying values based on new investments, sale of existing investments, mark up/down of current investments, the businesses responsible for each investment, and year-to-date gains/losses. From an aggregate risk tolerance perspective, there is currently a \$500 million stress loss limit in place for this activity, for which the relevant stress test in Risk Management’s 1987 stock market crash scenario. Alternative investments currently yield a 1987 loss impact of around \$300 million, or around 15% of the total carrying value

The great majority of alternative investments at Bear are carried at fair value, with \$187 million accounted for according to the equity-method.

## B. Merchant Banking

### Overview

Bear Stearns Merchant Banking (BSMB) was founded in 1997. Initially the group invested only Bear and Bear employee money. After developing a track record, the firm decided to raise outside capital as well. However, the primary stated objective of BSMB investments remains capital appreciation, as opposed to facilitating the generation of fee income.<sup>13</sup>

Since inception, the business has launched four funds. Two of the funds - Portfolio I and Captive Bear Growth Capital – were funded entirely with Bear and Bear employee money. The other two, MBP II and MBP III, accepted outside money and thus are also referred to internally as the “institutional” funds. The following table summarizes all BSMB activity as of Dec-2006:

Fund	Total Fund Size (Commitments)	Amount Invested	# Of Investments (Companies)	Realized Proceeds	Unrealized Proceeds	Gross IRR
Portfolio I	\$196.60	\$196.60	19	\$1,037.60	\$21.10	73.8%
BGCP	\$375.00	\$162.50	11	\$96.90	\$170.40	54.8%
MBP II	\$1,482.00	\$1,349.30	23	\$1,099.80	\$1,280.00	27.3%
MBP III	\$2,682.00	\$325.80	2		\$325.80	
<b>Total</b>	<b>\$4,735.60</b>	<b>\$2,034.20</b>	<b>55</b>	<b>\$2,234.30</b>	<b>\$1,797.30</b>	<b>56.3%</b>

Portfolio I has been completely invested and virtually all of the investments have been monetized. MBP II, which was launched in 2000, is mostly invested, but a good portion of its investments have not yet been exited. BGCP is approximately half invested, while MBP III is largely not invested – meaning the fund is in its relative infancy. The unrealized proceeds are equal to the investment amount for MBP III because the investments that have been made are

<sup>12</sup> One caveat to this process is that it is the Management and Compensation Committee (the second most senior decision making body at the firm) that approves establishing new BSAM funds. In addition, individual fund managers making investments greater than \$20 million must meet with Warren Spector.

<sup>13</sup> BSMB charges a 1.75% management fee on third party assets under management and a 20% performance fee.

still being held at cost, as sufficient information has not become available (or time elapsed) for changing those marks.

In addition to investing directly in the Merchant Banking funds, Bear provides leverage to its employees to invest in the funds. For MBP II Bear provided 3-to-1 leverage and for MBP III 2-to-1 leverage.<sup>14</sup> This financing is provided via non-recourse loans, creating additional Bear Stearns exposure to the BSMB fund investments. While Bear's exposure through the leverage program is senior to the employee equity (i.e., the employees incur the first loss), the full loan amount is included in the exposure and capital numbers herein. In other words, the \$740 million Merchant Banking carrying value is made up of \$547 million in Bear equity and \$193 million in employee leverage.

As illustrated in Table 1, BSMB performance has been very strong, with an approximate 50% gross (before fees or operating expenses) annual return to date across all investments. As a matter of investment objective, the business seeks outsized returns – which it defines as 1,000 basis points (10 percent return) above the S&P 500.

### Strategy

Through the institutional funds (MBP II and III) the business targets investment sizes in the \$100 million to \$250 million range. The BCGP fund's maximum investment size is only \$25 million, as it was created to allow the business to pursue the smaller opportunities that did not fall within the stated parameters of the institutional funds. The overall focus of BSMB is on middle market companies – those with enterprise value in the \$200 million to \$1.5 billion range and EBITA greater than \$25 million. Within this spectrum the business pursues classic LBOs of relatively mature companies (utilizing leverage from banks), as well as investments in smaller, growth opportunity companies such as financial service start-ups. But in general the business does not have a venture capital focus, nor does it participate in the larger public-to-private buyouts. Many of the investments are majority stakes, but BSMB does take minority interests alongside entrepreneurs as well. BSMB does not, however, invest with other financial sponsors in companies, articulating a strong aversion to “club” deals. Similarly, BSMB does not invest in third party funds.

BSMB has a team of 39 investment professionals who focus on three primary industries: Retail, Financial Services, and Consumer Products. Within these industries, the funds invest in a variety of transaction types – e.g., industry consolidations, restructurings, and growth situations. In terms of geographic focus, the Institutional funds invest primarily in North America. Based on investment guidelines, fund managers have the ability to invest up to 25% of commitment outside of North America.

The targeted investment horizon for BSMB investments is three to five years. Typical exit strategies include sale to a strategic (corporate) buyer, sale to a financial buyer (i.e., another investor), sale to other existing shareholders, and public offerings. Depending on the dynamics in the public and private equity markets, opportunities may exist to exit investments more quickly than originally planned, which the business will take advantage of. In addition, BSMB proactively seeks opportunities to take cash out of investment companies through dividends and dividend recapitalizations. In recent years the benign credit environment and ample investor demand for corporate debt has made this approach increasingly viable.

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<sup>14</sup> The total employee commitment to the two funds, including leverage, is \$951 million.

BSMB sources investments from a variety of places. The deal teams are “out all day long looking for opportunities” and incentivizing parties in their networks to bring opportunities to them. These parties include investment banks, other Bear Stearns businesses, senior corporate executives within targeted industries, professional deal finders, entrepreneurs, board members, regional bankers, etc. BSMB personnel feel the sector expertise of their investment professionals and position as part of Bear Stearns help make BSMB an attractive investment partner. For instance, there are synergies between Bear’s fixed income business and financial services companies engaged in consumer finance and subprime credit. Also, the investment portfolio companies can benefit from Bear’s expertise in structuring, tax issues, etc.

The degree of control asserted by BSMB over its portfolio companies is described as one of direct influence over the investments, but without assuming operational control. For instance, BSMB does not insert its own employees into roles such as CEO, but does take Board seats and work with company management teams on issues such as operating and capital budgets, analyses of perspective follow-on acquisitions, designing compensation plans, etc. Further, when company management teams do not perform, BSMB will replace them.

BSMB invests in companies on both a leveraged and un-leveraged basis. When utilizing leverage (bank debt), the business receives about 25% of its financing from Bear’s corporate lending business, and about 75% from outside banks. When asked more broadly about the industry impact of the readily available credit in recent times, BSMB staff explained they do loose deals because they are not willing to place the same leverage levels on companies as competing bidders. For instance, a recent deal was noted that closed at 7-to-1 leverage on a company that BSMB was only willing to apply 6-to-1 leverage to. BSMB also asserts its strategy is not one focused on the ability to buy and finance companies, but on increasing company cash flows over time.

#### Due Diligence and Risk Management

The due diligence and business review of investment opportunities is typically performed by a deal team of three BSAM professionals, who utilize a number of outside professionals such as accountants, engineers, industry experts, actuaries, private investigators, and attorneys. The teams analyze the potential strengths and risk associated with an investment opportunity by examining the company’s products/services, market position and industry dynamics, business plan, etc. The process also includes industry competitive positioning studies, review of all insurance programs and potential liabilities, comprehensive background checks, etc. The entire due diligence process, which typically takes between 90 to 180 days, culminates with a presentation to the Bear Stearns Investment Committee (BSIC).

The BSIC is comprised of fourteen members: eight from BSMB and six senior executives from other areas of Bear Stearns (e.g., head of IB). A detailed investment memo is delivered on every investment. These memos include a description of financial models, industry studies, company capitalization, investment rationale, business and industry overview, biographical information on management, summary of third party due diligence, etc. All investments require the unanimous consent of BSMB partners. In addition, as discussed above, all firm investments greater than \$20 million are brought to the Executive Committee, which is largely focused on assessing the potential reputational issues that may arise from investing in a particular company.

The due diligence process is described as involving spending an “extraordinary amount of time” on companies before investing, and paying a lot outside professionals a lot of money in the process. It was also noted that at one point the business went two years, around 2000-2002, without making a single investment.

BSMB funds have prescribed diversification requirements. For instance, a single investment can comprise not more than 20% of a fund. However, the business has yet to allocate as much as 10% of a fund to a single investment.

### C. Asset Management

Bear Stearns Asset Management (BSAM) has four main business units: Traditional Products, Hedge Funds, Private Equity, and Bear Measurisk. Traditional Products are equity and fixed income mutual funds managed by Bear Stearns. Through the Hedge Funds business, BSAM manages its own funds and fund-of-funds (FoFs), and also seeds third party funds. Likewise, the BSAM Private Equity business manages its own funds (separate from BSMB), offers FoFs, and invests in third party funds. Bear Measurisk is a service that collects positions from internal and many external mutual and hedge funds, and provides risk analytics to institutional investors such as fund-of-funds managers for informing investment decisions.<sup>15</sup> The 2006 assets under management (AUM), revenues, and value of Bear’s investment are reported for the three major fund types in Table 2 below:

	<u>AUM</u>	<u>Revenues<sup>1</sup></u>	<u>Bear Investment<sup>2</sup></u>
Traditional Funds	\$34.6 billion	\$100 million	\$106 million
Hedge Funds	\$5.6 billion	\$20 million	\$367 million
Private Equity/Venture Capital	\$1.17 billion	\$200 million	\$109 million
Other Strategic <sup>3</sup>			\$31 million
	<b>\$41.39 billion</b>	<b>\$325 million</b>	<b>\$613 million</b>

<sup>1</sup> Includes management fees, performance fees, and returns on BSAM principal investments, which collectively comprise the vast majority of BSAM’s total revenue. Numbers are approximate values.

<sup>2</sup> Includes Bear’s investments in third party funds: \$24 million in private equity and \$135 million in hedge funds.

<sup>3</sup> Represents BSAM strategic investments in three third party brokerage/investment firms.

In terms of trends, the above relative composition of AUM by fund type is not expected to change drastically in the foreseeable future, although hedge funds may grow somewhat as a percentage of the total. The broad philosophy conveyed by BSAM management is not wanting to specialize in any particular area, but rather to “do it all”, so that the business can offer a variety of product to customers.

BSAM’s clients are investors such as endowments and foundations, pension funds, high net worth individuals, fund-of-funds, corporations, etc. BSAM has sales people who distribute directly to investors, but also distributes through intermediary channels. For instance, high net

<sup>15</sup> Interestingly, BSAM is receiving position level data in Bear MeasureRisk from about 800 hedge funds.

worth individuals invest in BSAM product through Bear Stearns “Private Client Services” business (Bear’s financial advisory business for high net worth individuals), as well as through external consultants/gatekeepers. BSAM also uses 3<sup>rd</sup> party distributors, has other portfolio manager customers, etc.

### Hedge Funds

As illustrated in Table 2, BSAM’s total hedge funds investment is the largest of the three major fund types. BSAM has twelve proprietary hedge funds that pursue a variety of strategies (Emerging Markets, Europe Long/Short, ABS, etc.), as well as one FoF.<sup>16</sup> Bear’s investment in any one internal fund as of December 2006 ranges from under \$1 million to just over \$32 million. In addition, BSAM has seeded eight external hedge funds, with 2006 investment amounts ranging from \$5 million to \$26 million. The business has grown its proprietary fund offering over time partly as new fund managers seeking seed capital to develop track records have been brought onto the BSAM platform. In other instances, managers starting new funds have approached Bear in search of capital, but have not wanted to join the BSAM platform, hence the existence of the external fund exposures. As depicted in Table \_\_, Bear’s total seed capital in internal hedge funds is about \$230 million, versus \$135 million in external funds. BSAM staff stated that, recently, most growth has come from growing the Bear platform (internal funds)

When a new BSAM fund is created, BSAM assumes complete oversight of its activities, and the manager/staff uses BSAM’s infrastructure (office space, IT, etc.). Through the third party seeding arrangements, BSAM acquires a stake in the funds’ fees, but the funds may not use the Bear brand or infrastructure. The size of BSAM’s stake in an outside fund’s fees varies with the investment amount, under what was described as a “point per dollar” scale. For example, if BSAM invests \$15 million it typically would receive a 15% interest in the fund’s fees. The benefit to the external funds from these arrangements is the ability to advertise that Bear Stearns is an investor, as well as build a track record. In general, there are provisions in these agreements which permit the funds to later re-purchase BSAM’s stake in the fee income.

When internal BSAM funds are initially launched Bear’s seed capital often represents a large portion of AUM. The general idea is for BSAM to withdraw its money as a manager establishes a track record and investor money comes in. This can take some time; for instance, there are currently several internal funds for which Bear does not expect to withdraw any of its initial capital during 2007. There have also been instances where new funds performed poorly and BSAM closed and liquidated the funds.

Similarly, Bear’s investment in a third party hedge fund can initially comprise a large portion of AUM. Typically, Bear’s entire investment is locked up for one or two years when seeding external funds. Subsequently, the negotiated pace at which BSAM can withdraw its initial capital and profits can vary. For instance, one possibility is for BSAM to withdraw all capital and profits in excess of \$5 million at each year-end following the expiration of the lock-up, allowing the fund to keep \$5 million in equity indefinitely. When BSAM seeds third party funds, it requires the funds to submit their positions to Bear MeasureRisk periodically, providing direct

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<sup>16</sup> BSAM’s management expressed a view that the hedge fund-of-funds business is not viable in the long run. Alternatively, BSAM also offers a product it calls its Open Architecture Platform, which allows investors to use Bear MeasureRisk to build portfolios from a list of external funds that are vetted by BSAM. Currently approximately forty outside funds are offered through the Open Architecture Platform.



insight into the risk of the portfolios. Further, various upfront restrictions are placed on the manner in which the external fund managers may invest BSAM's capital.

### Private Equity

BSAM manages three private equity funds directly and four private equity FoFs, and has investments in several external funds and FoFs. In addition, BSAM has three investments in outside funds which it considers strategic investments, and are thus managed along with other strategic investments (discussed separately below). The three direct private equity funds have a venture capital focus (early to mid-stage companies), specializing in the digital media, communications, technology, and healthcare sectors. BSAM's private equity FoFs invest in external funds that pursue a variety of strategies and investment types – e.g., venture capital, distressed companies, real estate, mezzanine debt, and LBOs.

BSAM's FoF business gives it a “secondary” private equity presence. Some of the FoFs are exchange listed and/or trade in a secondary market. In addition, FoFs provide some additional ability for private equity investors to more rapidly inject and remove capital. As previously discussed, traditional private equity funds call investor commitments over time as opportunities are exploited, and those funded investments may then be locked up for several years. Alternatively, secondary products help investors avoid the so called private equity “J-curve”.

The time horizon of BSAM's private equity investments can vary. For instance, of its current investment the business expects to start withdrawing some or all of its equity any time between December of 2007 and 2017.

### Investment Approval and Risk Management

Various internal due diligence and governance processes are in place at BSAM for approving and seeding new funds and vetting new fund managers, establishing guidelines and risk parameters for directly managed funds and monitoring the risk positions of those funds, selecting private equity investments, and investing in external funds. When new funds of any type that require seeding are launched, approval is required by internal BSAM management/Committees, as well either the Bear Stearns Executive or Management and Compensation Committee. In order to carry out the ongoing risk management of the business, BSAM has established various supervisory and oversight committees, as well as a dedicated risk management group<sup>17</sup>. For instance, there is an internal Risk Committee which monitors and analyzes market and credit risks, compliance with investment guidelines, etc., a New Products Committee which approves all new investment products and services, a Price Valuation Committee, and of course a senior Management Committee.

Bear MeasureRisk provides a battery of analytics by which fund portfolios are monitored and analyzed. For instance various market risk sensitivities for different types of instruments are computed (e.g. interest rates and credit spread DV01s, equity delta and gammas, etc.), stress tests and scenario analyses are performed across numerous market risk factors, long, short, and net market values are reported by instrument type and geographic sector, VaR metrics are computed at various levels of aggregation and detailed portfolio risk decompositions are performed, etc. MeasureRisk also identifies risk concentrations and less liquid positions (e.g., an equity position

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<sup>17</sup> 2007 events relating to the difficulties faced by the BSAM “High Grade” and “Enhanced” funds are not discussed herein. However, following these events the Executive Committee decided to have BSAM's internal risk group, which consists of six full-time professionals, report to Mike Alix (the Bear Stearns CRO).

that represents greater than tens days of trading volume), computes leverage ratios, etc. MeasureRisk is also used for liquidity risk management purposes, for instance in monitoring unencumbered assets and current repo activity, assessing the impact of applying stresses to the haircuts on the firms secured financing activities, etc.

#### **D. Arroyo Energy Investors**

Arroyo Energy Investors was formed in April of 2003. The business primarily makes equity investments into “independent power” related projects in the United States. Arroyo engages in two main transaction types – investments in power purchase agreements as well as in power plants, both of which involve a long-term above market power purchase agreement (PPA). Arroyo is typically either purchasing/investing directly in an independent power producer (IPP), or monetizing contracts for an IPP (through a SPV) that is party to long-term contracts that enables it (the IPP) to sell power at well above market prices.<sup>18</sup> These deals tend to involve older plants that, but-for these long term PPAs, would not operate profitably. In other words, these plants are often producing power more expensively than can be purchased in the spot market.

As of December 2006, Arroyo had investments in five PPAs which it has restructured (carrying value \$47 million), and two power plants (\$30.9 million). Separately, the business has two legacy investments acquired in connection with Section 29 tax credits; investments involving ownership of a Coke battery in a steel plant and rights to natural gas. Since being formed in 2003, the business has sold/exited investments in two addition power plants – meaning it had made a total of nine investments as of December 2006. Also, in January 2007, the business also closed a deal to purchase 18 power plants from Delta Power.

Arroyo’s business plan for its investments is to make commercial and operational enhancements to an IPP investment by executing contract amendments or exercising existing options with the original project documents that materially increase the expected cash flows, or executing contract amendments or implementing commercial directives that reduce the risk (uncertainty) of future cash flows. Because these transactions always involve PPAs, this business does not create a lot of energy price (market) risk. Not all projects have perfectly matched supply and off take positions, so the business attempts to hedge any remaining market risk (it also hedges interest rates risk). In other words, the business model is to lock in streams of highly predictable cash flows (which can then be valued as annuities using discounted cash flow methods). Therefore, the most material risks born by this business are the credit risk to the power purchasers, and the operational risk to the power plants. Much of the operational risk is actually insured away. Regarding the counterparty risk, the sentiment at Bear seems to be that, since these PURPA contracts have been “blessed” by state and federal regulators, if a utility (power purchaser) was to go bankrupt, IPPs would be placed at the top of the pecking order of creditors.

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<sup>18</sup> In 1978, the Public Utility Regulatory Act (PURPA) required utilities to purchase power from independent power producers as a way of promoting competition and efficiency (the country was in the midst of an energy crisis). Before this legislation, only traditional utilities could own and operate power generating plants. Many IPPs signed contracts to sell power to utilities in the 1980s at prices that are well above current spot prices. In the 1980s and 1990s, there was a lot of development of IPP projects by industrial companies and entrepreneurs. Over the last five or so years, as there has been stress on these businesses, financial firms have begun to consolidate a significant amount of ownership of IPP assets.

As illustrated above, the Arroyo business makes relatively few investments, each of which involves extensive due diligence and negotiating, taking several months. The due diligence performed is obviously not just financial in nature, but is intensive in terms of technical, environmental, and legal concerns. As a result, Arroyo hires third party engineers and attorneys to examine and report on the past and likely future operating performance of physical power plants, examine litigation and third-party liabilities, environmental compliance, etc. Often at the end of the due diligence process, the business declines to further pursue the opportunity. All of Arroyo's investments are approved by the Executive Committee.

This investing business is currently managed separately from the (new) commodities trading business, also located in Houston. However, there appear to be aspirations of pursuing synergies between the two desks, given the highly physical focus of the Arroyo team.

### **E. Strategic Investments**

Bear has established a Corporate Strategy Group (CSG), comprised of fourteen "forwardly deployed strategy people" who work for the businesses in helping decide where to grow and shrink their activities. CSG is a centralized department which is involved in Bear's acquisitions as well as strategic investing processes. For instance, the CSG was engaged in Bear's decision to vertically expand its mortgage business through BearRes and Encore. But it also seeks to ensure that strategic investment opportunities are reviewed using a consistent, rigorous process, and are presented to senior department managers and the Executive Committee in a fair and consistent manner. The group also performs ongoing risk management and oversight of strategic investments. The current carrying value of Bear's thirteen Strategic investments managed through this group is \$170 million.

Strategic investments, which can either take the form of investments into private equity funds or direct corporate investments, are not entered into because of the potential returns of the investment opportunity on a stand alone basis. Such investments also entail expected supplemental returns to the overall Bear franchise. Strategic investments can either improve Bear's competitive position (e.g., an investment into a stock exchange) or are done to facilitate a customer relationship. For example, one of Bear's existing strategic investments is in a relatively new hedge fund managed by the Carlyle Group. While Bear would not have wanted to make a principal investment in this fund purely for the sake of doing so, Carlyle pays in the ballpark of \$1 billion in fees to Wall Street firms annually, and is a particularly large commercial real estate player. Bear is quite active in CMBS markets via loan origination and securitization, as well as in terms of its investment banking sector expertise. For instance, the recent and highly publicized leverage buy-out of the Equity Office Products REIT was a Carlyle deal. Bear was the primary M&A advisor and was one of three primary financing arrangers for the deal, which was considered a success.

## APPENDIX B: GOLDMAN SACHS

### A. Overview of Activities and Senior Governance

Goldman publicly discloses a “principal investments” number, which is comprised of its outsized investments in Sumitomo and the Industrial and Commercial Bank of China (“ICBC”), as well as seed capital in internally managed Merchant Banking funds. However, the firm also makes considerable private equity and similar investments through its trading, or Securities division.<sup>19</sup> The firm also seeds internal hedge funds and traditional funds, and invests in third party funds, but this is much less material than the other investment activities. The net carrying values of Goldman’s principal investments by broad category are summarized below<sup>20</sup>:

Sumitomo -	\$1.435 billion
ICBC -	\$1.914 billion
Merchant Banking <sup>21</sup> :	
Corporate (PIA) -	\$3.675 billion
Real Estate (REPIA) -	\$0.588 billion
Trading Division -	\$6.375 billion
Asset Management:	
Hedge Funds -	\$48 million
Traditional Funds -	\$214 million

### Merchant Banking

Goldman’s Merchant Banking Business has two major business divisions – the Principal Investment Area (“PIA”) and the Real Estate Principal Investment Area (“REPIA”). The former makes equity and debt corporate investments, while the later makes equity and debt real estate related investments.

#### Principal Investments Area (PIA)

Goldman formed PIA in 1991. The business pursues two primary strategies. GS Capital Partners funds make private equity investments and GS Mezzanine Partners funds invest primarily in corporate mezzanine debt instruments. The mezzanine funds comprised \$582 million of the \$3.675 billion total PIA related investment in Q4-2006. PIA also makes some Venture Technology Investments, which are purely Goldman positions (are not made through the institutional funds). As of 2006, the carrying value of such positions was \$149 million. Thus the majority of Goldman’s share of the PIA investments is made in private equity.

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<sup>19</sup> For public disclosure, Goldman uses two stress tests for reporting the risk of positions held by the Securities divisions that are not included in (or well captured by) VaR. One stress result is reported for equity positions and another for debt positions. For purposes of this report we have included the positions disclosed through the equity stress test.

<sup>20</sup> All values are net of any hedges or liabilities held at the investment company level, in an attempt to show the true economic value of Goldman’s interest.

<sup>21</sup> Goldman’s adoption of SFAS 157 in Q1 2007 resulted in a one time gain of approximately \$500 million for the Merchant Banking Division.

As of 2006, PIA had launched five Capital Partners funds and four Mezzanine Partners funds. The following two tables summarize the history and size of the funds, as well as Goldman's fund commitments:

Fund	Year Closed	Total Commitment	GS Commitment <sup>1</sup>
Broad Street <sup>2</sup>	1986	\$250 million	\$25 million
Water Street <sup>2</sup>	1990	\$783 million	\$100 million
GSCP/Asia	1992/94	\$1.335 billion	\$375 million
GSCP II	1995	\$1.750 billion	\$300 million
GSMP	1996	\$800 million	\$100 million
GSCP III	1998	\$2.775 billion	\$500 million
GSMP II	2000	\$1 billion	\$166 million
GSCP 2000	2000	\$5.250 billion	\$600 million
GSMP III	2003	\$2.001 billion	\$452 million
GSCP V	2005	\$8.506 billion	2.535 billion
GSMP 2006	2006	\$5.250 billion	\$2 billion
<b>Total</b>		<b>\$29.7 billion</b>	<b>\$7.153 billion</b>

<sup>1</sup> Does not include commitments of Goldman employees.

<sup>2</sup> Goldman first began establishing partnerships allowing outside customers to co-invest in long-term equity opportunities in 1986. Thus the Broad and Water Street funds preceded the formation of the PIA business in 1991.

Fund	Total # of Investments	# of Remaining Investments	Remaining Investment Carrying Value	Gross IRR
Broad Street	21	0	0	30.00%
Water Street	22	0	0	33.00%
GSCP	49	0	0	34.00%
GSCP Asia	17	0	0	17.00%
GSCP II	54	6	\$97 million	7.00%
GSCP III	73	17	\$300 million	1.00%
GSCP 2000	59	27	\$3,226 million	34.00%
GSCP V	33	32	\$9,854 million	
GSMP I	17	0	0	13.00%
GSMP II	25	10	\$557 million	18.00%
GSMP III	36	24	\$2046 million	
GSMP 2006	16	16	\$4,540 million	

As shown above, Goldman's cumulative \$7.153 billion investment through 2006 represented 24% of the total capital committed to the funds. In addition, in 2007 Goldman closed GSCP VI, which has approximately \$20 billion in commitments, approximately \$6 billion of which came from Goldman. An observation that stands out from the fund histories is that the Capital Partners funds have gotten larger over time while the number of investments in each fund has reduced. In other words, the funds have become less diversified over time, as the overall trend in the LBO industry has been one towards pursuing larger buyout targets.

The Capital Partners funds currently target equity investments in the range of \$200 million to \$800 million in companies with enterprise value of between \$500 million and \$25 billion. In other words, the business makes relatively large investments in what tend to be larger and more mature companies. The business pursues a variety of transaction types, such as leveraged buy-outs, public-to-privates, build-ups, strategic capital investments (e.g., to fund an acquisition), and PIPEs. It invests in a wide variety of industries worldwide. The particular mix of investments in terms of industry and geography depends on the available opportunities; for instance, Asia was a large growth area last year. Target investment horizons are between three to five years and a variety of exit strategies are employed, including strategic sales, sales to other investors, IPOs, and withdrawing money via dividend recapitalizations. The mix of exit strategies used at any particular time depends largely on market conditions. For instance, more recently sales to other private equity firms have become more common. PIA sources about 75% of its deals from Goldman Sachs relationships, including through relationships with financial sponsors. In terms of the amount of control PIA asserts over its investment companies, the business puts people on the boards and sometimes brings in new management (possibly as part of the initial investment thesis).

The Mezzanine Partners funds target investments in the \$70 million to \$500 million range. The funds lend to established companies with stable cashflows, typically with enterprise values in the range of \$500 million to \$10 billion. BSMP investments fund acquisitions, recapitalizations, etc., and are generally structured as subordinated debt (both loans and bonds) with typical high yield terms and a small equity component. The business also makes some direct equity investments. The vast majority of investments are in private companies.

### Risk Management

The senior investment decision making body at PIA is the Investment Committee (IC), which is comprised of 22 managing directors, chosen by the Goldman Sachs Management Committee. The Investment Committee members include all PIA partners, PIA's CFO, PIA's legal counsel, the Goldman Sachs Controller, and two senior members of Investment Banking. Deal teams conduct extensive due diligence on potential investments, utilizing outside professionals and consultants in the process. Deal memos are provided to the Investment Committee for approving transactions. Typically sessions for approving transactions last hours, and changes to the investment plans often result. PIA personnel assert the IC is very focused on what the deal teams plan on doing with a company once they own it, and what the exit strategy is. For instance, some investments companies may never be an IPO candidate; in such instances the IC seeks to understand exactly why the deal team feels another buyer will be there down the road. While every investment is approved by the IC, certain investments may be referred up to Goldman's Management Committee; however, there is no formal requirement for it to do so. In addition, the Investment Committee solicits advice from other Goldman personnel, such as staff in the Investment Banking or the Credit departments, in evaluating deals.

Fund Guidelines (Partnership documents) include broad concentration limits, which dictate that no more than 15% of fund capital can be invested in any one company. The Investment Committee then exercises further discretion and, in practice, typically no single investment represents more than 10% of the fund. The IC also considers product type/industry diversification, above what is stated in the partnership documents, when determining investment strategy and mix. Also, typically three to six months pass between when Goldman agrees to a

deal (signs) and the deal closes. During this period the business can further decide whether it wants to hold the entire exposure, or bring in co-investors – namely other financial sponsors or other Goldman businesses (e.g., Private Wealth Management).

In addition to approving investments upfront, The Investment Committee is also responsible for the ongoing oversight and valuation of investments, and meets every Tuesday to discuss events in the portfolio.

#### Real Estate Principal Investments Area

The following table summarizes the history of REPIA funds, as of 2006:

Fund	Total Commitment (Equity)	GS Commitment	# of Remaining Investments
Whitehall I & II	146	24	0
Whitehall III & IV	805	200	0
Whitehall V and VI	1,055	200	4
Whitehall V-S & VI-S	150	28	0
Whitehall VII and VIII	1,350	250	10
Whitehall IX and X	1,625	250	7
Whitehall XI and XII	2,261	400	17
Whitehall XIII/XIIP	1,860	400	29
Whitehall Global 2001	2,480	402	51
Whitehall 2005	3,804	900	47
GS Core Plus	145	17	6
GS Emerging Market	375	50	2
Infrastructure Partners I	6,541	749	3

Currently, the REPIA business targets equity investments in the \$25 to \$150 million range, and mezzanine debt or preferred equity investments in the \$15 million to \$100 million range. The target investment horizons are four to five years. The geographic allocation of the business's investments is 54% Americas, 38% Europe, and 8% ASIA.

#### **Securities Division**

The majority of equity principal investments generated through Goldman's Securities Division are owned by two businesses, the Special Situations Group (SSG), and the Goldman Sachs Principal Strategies (GSPS) desk. As of November 2006, the carrying value of SSG's relevant positions was nearly \$4 billion, and GSPS's was nearly \$1 billion. Given the relatively small size of initial GSPS and SSG investments, which is typically less than \$20 million, no discussion of deal approval is warranted.

#### Goldman Sachs Principal Strategies (GSPS)

GSPS is purely a proprietary desk. Generally speaking, the desk pursues a fundamental long-short equities strategy. The business does a lot of "bottoms up" stock picking, and is very focused on hedging out the risks it does not want. For instance, traders will hedge out the commodities market risk of investment companies. The desk is also a very large user of single

name equity puts. While focused on equity-like rewards, GSPS traders will look across the corporate capital structure for opportunities; however the business has not been at all focused on debt investments more recently. At times, the traders will also use volatility to express views.

As of 2006, approximately 8% of GSPS's net market value of positions was in private companies, with the rest in public securities. However, private deals have been generating more than 8% of the business's P/L; and the desk's hit rate on private deals (the percentage of investments for which the desk has met or exceeded its internal required rate of return) has been greater than 90%. Thus while these positions are less liquid, there is a view that they are "worth it". The business heads wants to grow its private activities to between 10% and 15% of GSPS book in the coming years.

GSPS's private investments are much smaller than those made through the Merchant Bank; the largest as of November was \$78 million. The business does not pursue the "ten year LBO type investments". For private deals the target investment horizon is three years or less. While the business does invest on an equity basis, the traders are often able to structure deals in a way that can limit the economic downside – for instance by creating a special class of equity or structuring the transaction so that Goldman gets to take money out of the company before other equity investors. Furthermore, the business is very focused on removing or protecting against any "perverse flexibility" the companies' management may have. Although, as a general principle, GSPS acts as a passive minority investor in companies. As a matter of policy the desk does not take majority stakes, because of the resulting consolidation that is triggered for accounting purposes. Consequently, if the business identifies an opportunity where it would like to buy an entire company, the traders will look to bring in outside co-investors. GSPS personnel will take Board seats, and likes to think of themselves as "value added" investors. However, GSPS staff will only take seats in situations where it is felt "necessary", and will drop the seats once the company goes public.

While GSPS does not pursue large investments, it will sometimes engage in the more start-up or venture capital type investments. These entail a large probability of losing the entire investment (around 80%), but the winners can make ten or twenty times the investment. In contrast to this venture type risk, the desk will also "do things on the really safe side".

#### Goldman Sachs Special Situations (GSSG)

GSSG, which is also a pure proprietary (or buy-side) business, describes its mandate as "investing the firm's capital across all levels of corporate capital structures and in numerous other investment activities seeking optimal returns on a risk adjusted basis." Investments in corporate capital structures include of course public and private equity (as well as PIPEs), bonds, loans, distressed bonds and loans - but also middle market lending, mezzanine lending, DIP and rescue financing, etc. Thus the business invests in various ways in large and small companies. In addition to investing in individual companies, SSG buys portfolios of corporate, consumer, and real estate related receivables/loans/leases – for example portfolios of credit cards, auto loans, and non-performing mortgages. It also invests in other physical assets - e.g., power plants and golf courses, and pursues investments that entail some tax component. In all, SSG's net balance sheet is greater than \$20 billion.

Like GSPS, this business pursues a completely different type of private equity investment than the PIA business. Namely, SSG invests smaller amounts (\$25 million is their maximum



threshold), typically in less mature companies (it does no LBOs). It also does not take a very active role in running the companies it invests in - relying on the management teams it has identified or partnered with. While private equity investments are not currently a dominant component of SSG's book, this activity has become more important recently, particularly in Asia. SSG personnel note that the average life of their deals has been pushed out from around 18 months to 22-24 months over the last few years, driven in part by some of the private equity transactions. Some of these deals (in particular some of the ones that have made the financial press), actually involve SSG buying physical assets along with an operating partner (with industry/management expertise) to create an operating company. The exit strategy for such deals can often entail an IPO.

Two of the more successful deals that SSG has done more recently in have been Accordia Golf and Horizon Wind Energy. With Accordia SSG began purchasing Japanese golf courses around 2001, and formed a management company by hiring management it met through a related distressed deal. While originally the business thought it might pursue individual asset sales, it ended up taking Accordia public in 2006 (after building it up for five years). Horizon, meanwhile, involved Goldman making investments in wind farms starting in 2005, when it purchased the then private Horizon (which was followed by several more rounds of capital infusions throughout 2006). While it was originally thought that investment would likely culminate in an IPO, an opportunity came along to pursue a strategic sale in 2007.

## APPENDIX C: MORGAN STANLEY

### Business Overview

At Morgan Stanley, Private Equity and Principal Investment transactions primarily occur within two businesses units—Morgan Stanley Principal Investments (MSPI), which resides within the Institutional Securities Group (ISG), and Asset Management (also referred to as Morgan Stanley Investment Management (MSIM)).<sup>22</sup> MSPI's transactions have more of a “traditional” private equity flavor where the firm seeks to earn returns through long-term capital appreciation, often with a capital markets activity take-out at the end of the investment period. MSIM, on the other hand, is predominately a fee-based asset management business where the goal is to enhance the firm's ability to grow fee-based businesses or to maintain their status as a market participant.

Internally, Morgan Stanley further classifies these activities as business facilitation, principal investment, miscellaneous employee compensation plans, or other.

*Business Facilitation* investments, which are made to support core business activities and advance business growth, include the following:

- Private equity funds – Investments in private equity funds within Asset Management.
- Real estate funds – Investments in Morgan Stanley Real Estate funds within ISG.
- Other asset management seed capital – Investment in the Core or Alternative Investments business units (typically an equity, fixed income, or hedge fund investment).
- Industry utilities – Investments made to participate in an industry consortium or an industry service (e.g., Markit Partners or the NYSE).
- Exchange memberships – Investments that provide the broker-dealer with the right to do business on the exchanges of which the broker-dealer is a member. This can include both trading rights (the actual membership) and an ownership interest in the exchange (the ownership interest may be required in order for the broker-dealer to do business on the exchange).
- Structured investments – Investment made to support core business activities and advance business growth through monetization of losses generated from the investment and used against Morgan Stanley taxable income or to assist clients in achieving a desired tax result.
- Community investments – Legislated program investing (i.e., Community Reinvestment Act) made as part of requirements to operate as a regulated banking entity.
- Other – Any investment not included above, but made to support core business activities and advance business growth. This includes investments in Landsdowne Partners, Avenue Capital Group, and China International Capital Corporation.

*Principal Investment* includes all investments made primarily for capital appreciation purposes. While Principal Investment involves some level of business facilitation, the primary strategy is to earn a return through long-term capital appreciation.

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<sup>22</sup> See Exhibit 1 in the Appendix for an Organization Chart

*Miscellaneous Employee Compensation Plans* are investments made in connection with a firm sponsored deferred compensation or investment plan opened by the firm for the benefit of employees. Firm owned positions are off-set by liabilities to employees.

*Other* investments are simply those that do not fall within one of the three categories listed above.

### *Morgan Stanley Principal Investments (MSPI)*

As mentioned above, MSPI seeks to earn returns through long-term capital appreciation, often with a capital markets activity take-out at the end of the investment period. MSPI achieves this by investing Morgan Stanley's own capital (i.e., they do not invest with third part money) in areas where they can act as both a strategic and financial partner. Ed Sabounghi, Chief Operating Officer (COO) of Corporate Credit, pointed out that one of MSPI's objectives is to partner with companies that have skilled managers because they do not necessarily want to manage businesses. Additionally, MSPI representatives may serve on the Board of Directors of companies being invested in; however, the purpose is not to be an active participant (unless some type of workout is being undertaken), but more for informational purposes.

*Joint Venture* – While MSPI organizationally resides under FID within ISG, the business is actually a joint venture between Investment Banking (IBD), Fixed Income (FID), and Institutional Equities (IED). The three divisions are economic owners split by the bulk of work done and the content of work done. The split is roughly 45% IBD, 45% FID, and 10% Equities.

*Sourcing* for MSPI investments comes from both internal and external sources. One of the larger internal sources is Global Wealth Management (GWM) who might come across a deal that they may not be interested in because of its small size; or a deal might be exceptionally large (e.g., TXU), so MSPI might receive a call to see if they would like to take a portion of the deal. External sourcing includes corporate clients, financial sponsors, individual investors, and institutional investors.

*Investment Structures* – MSPI makes a majority of its investments through eight types of structures:

- Platform investments – in which MSPI provides capital to fund further growth through acquisition or organic expansion.
- New business initiatives – where they partner with talented management teams or corporate clients to identify and create unique investment opportunities.
- Shareholder recapitalizations – that provide capital to facilitate the recapitalization or refinancing of attractive companies facing short-term challenges.
- Structured joint ventures – where MSPI joins with the firm's corporate partners to provide financing structures that are intended to maximize value for the client and the firm.
- Pre-IPO investments – in which the business invests in companies that are on the verge of going public. Their intent is to provide pre-IPO funding when they find a client who wants capital earlier than can be achieved through an IPO. Depending on what the timescale of the investment is (usually event dependent); the firm may sell their holding

shortly after the IPO, or continue to hold until the stock reaches a pre-determined target price.

- Mezzanine debt – where MSPI provides capital to corporate clients in situations where traditional high-yield financing is unavailable. Mezzanine debt incorporates equity-based options, such as warrants, resulting in a lower-priority debt. This structure is often used to finance acquisitions and buyouts, where it can be used to prioritize new owners ahead of existing owners in the event that a bankruptcy occurs.
- Leveraged buyouts – which are investments where MSPI partners with private equity funds to pursue Leverage Buyout (LBO) transactions. An LBO typically involves the takeover of a company or controlling interest in a company, using a significant amount of borrowed money. The target company's assets often serve as collateral for the borrowed money.
- Debt/Equity conversions – which are opportunistic investments in companies during transition periods caused by market dislocations or inadequate balance sheets. A Debt/Equity conversion can also be a forced conversion that results in a convertible security being called against the will of the holder.

MSPI's investments typically range in size from \$15 million to \$250 million and have a maximum duration of 5 years (with typical durations of 2 to 3 years). MSPI focuses on risk adjusted return when considering an investment with a target IRR in excess of 20%. Mr. Sabounghi noted that it has been difficult to find larger investments that return 20% IRR, hence their reasoning for evaluating investments on a risk adjusted basis.

#### Morgan Stanley Investment Management (MSIM)

As previously mentioned, MSIM is predominately a fee-based asset management business where the goal is to enhance the firm's ability to grow fee-based businesses or to maintain their status as a market participant. This is accomplished primarily by using the firm's capital to seed investment strategies that MSIM intends to sell to clients. Examples of these investment strategies include Alternative funds, Equity funds, Fixed Income funds, and Private Equity funds.

Alternative funds are solutions oriented vehicles that are often structured with a specific client (or group of clients) in mind. By seeding alternative funds, MSIM helps the fund establish a track record and shows that they have skin in the game. There are currently 31 alternative funds that receive seed capital in excess of \$1 million from MSIM. Only 3 of the 31 funds are hedged.

Equity funds are traditional equity funds that are managed against a benchmark with expected redemption of MSIM's seed capital within one to two years. There are approximately 30 equity funds (which receive seed capital in excess of \$1 million), and MSIM hedges the systematic risk on all except 3 of the funds.

Fixed income funds are traditional funds that, similar to equity funds, are managed versus a benchmark. MSIM has provided seeding in excess of \$1 million to 8 fixed income funds, and generally hedges out a substantial portion of the interest rate risk. The funds provide daily or monthly liquidity to investors with MSIM's redemption of seed capital expected in one to three years.

MSIM also invests in private equity funds where Morgan Stanley is either the only general partner, or controls the general partnership of the fund. MSIM currently provides seed capital in excess of \$1 million to 8 private equity funds with zero hedging being done.

Success for each of the fund investments is judged based on the present value of the future stream of investment management fee revenues it attracts. As of month end January 2007, the amount of seed capital invested by MSIM, by strategy, were as follows:<sup>23</sup>

(\$ in millions)

	Investment	% of Total	Hedged Portion	
			\$	%
Fixed Income Funds	193	9%	93	48%
Equity Funds	242	11%	236	97%
Alternatives	805	35%	84	10%
* Employee Def. Comp. & Bridge Funding	594	26%	N/A	N/A
Private Equity	437	19%	0	0%
<b>Total</b>	<b>2,272</b>	<b>100%</b>	<b>413</b>	<b>18%</b>

\* Ken Winston stated that employee deferred compensations will no longer be on MSIM's balance sheet.

The table above shows that a substantial portion of MSIM's seed capital has been invested in Alternative type funds (which account for 35% of MSIM's total seed capital investment). The percent of total will be much larger when Employee Deferred Compensation is removed (which Ken Winston indicated has already been approved by Treasury and upper management).<sup>24</sup> Alternatives are classified as loans (i.e., CLO funds), structured products (e.g., hedge funds structured to hedge out inflation risk), ARS (which are hedge funds owned by Morgan Stanley directly), funds of hedge funds, or funds of private funds.

### Product Mix

The table below provides a summary of business facilitation investments and principal investments by business segment. ISG (or MSPI) accounts for \$5.6 billion of the Firm's \$8.0 billion total with the Fixed Income division making up most of ISG's total investment balance. The largest portions of Fixed Income's total are \$2.0 billion of Structured Investments, mostly mezzanine reference assets for CDO structures, and \$1.6 billion in Principal Investments.

Outside of ISG, a substantial portion of the remaining investment balances reside in Asset Management (or MSIM) with the single largest line item being \$1.4 billion in Other Asset Management Seed Capital—where 15% is invested in fixed income funds, 20% in equity funds, and 65% in alternative funds. The \$210 million Private Equity Fund investment balance is seed

<sup>23</sup> It is important to note that 78% of the \$2.3 billion of the seed capital was funding in 2006. This is consistent with what we heard with respect to Morgan Stanley's recent commitment to provide dedicated funding to grow private equity and principal investment businesses.

<sup>24</sup> \$536 million of the \$594 million in this line item is Employee Deferred Compensation (which are funds available to Morgan Stanley Employees). The remaining \$58 million is bridge funding. Since the deferred compensation amounts represent all of Morgan Stanley's employees and not just MSIM's, the capital allocation will be spread out pro rata by division in the future. MSIM's pro rata allocation will be approximately 5% or \$26.8 million. Adding this to the \$58 million in bridge funding will make the Employee Def. Comp. & Bridge Funding amount approximately equal to \$84.8 million instead of \$594 million.

capital to private equity funds with a majority of the balance taking the form of bridge funding. Ken Winston, the risk manager for the Asset Management business, pointed out that this is probably one of the riskiest investments you can do in this product space.<sup>25</sup>

#### Investment Schedule Stratification (as of November 30, 2006)

	Institutional Securities					Global Wealth Mgmt.	Asset Mgmt.	Discover	Total
	Fixed Income	Equity	Investment Banking	Other	Total ISG				
<b>Business Facilitation</b>									
Private Equity Fund	-	-	-	12	12	-	210	-	222
Real Estate Fund	-	-	608	-	608	-	-	-	608
Other Asset Mgmt. Seed Capital	-	-	-	-	-	-	1,412	-	1,412
Industry Utilities	221	236	-	3	460	20	0	-	480
Exchange Memberships	5	12	-	5	22	1	-	-	23
Structured Investments	1,988	-	-	-	1,988	-	-	28	2,016
Community Investments	-	-	-	57	57	-	-	20	77
Other	48	3	119	53	223	35	563	1	822
<b>Total Business Facilitation</b>	<b>2,262</b>	<b>251</b>	<b>727</b>	<b>130</b>	<b>3,370</b>	<b>56</b>	<b>2,185</b>	<b>49</b>	<b>5,660</b>
<b>Principal Investments</b>	<b>1,581</b>	<b>118</b>	<b>44</b>	<b>106</b>	<b>1,849</b>	-	-	-	<b>1,849</b>
<b>Misc. Employee Comp. Plans</b>	-	-	3	260	263	-	62	-	325
<b>Other</b>	<b>0.1</b>	-	<b>0.03</b>	<b>124</b>	<b>124</b>	-	<b>0.1</b>	-	<b>124</b>
<b>Total by Business Segment</b>	<b>3,843</b>	<b>369</b>	<b>774</b>	<b>619</b>	<b>5,605</b>	<b>56</b>	<b>2,247</b>	<b>49</b>	<b>7,957</b>

#### Morgan Stanley Real Estate

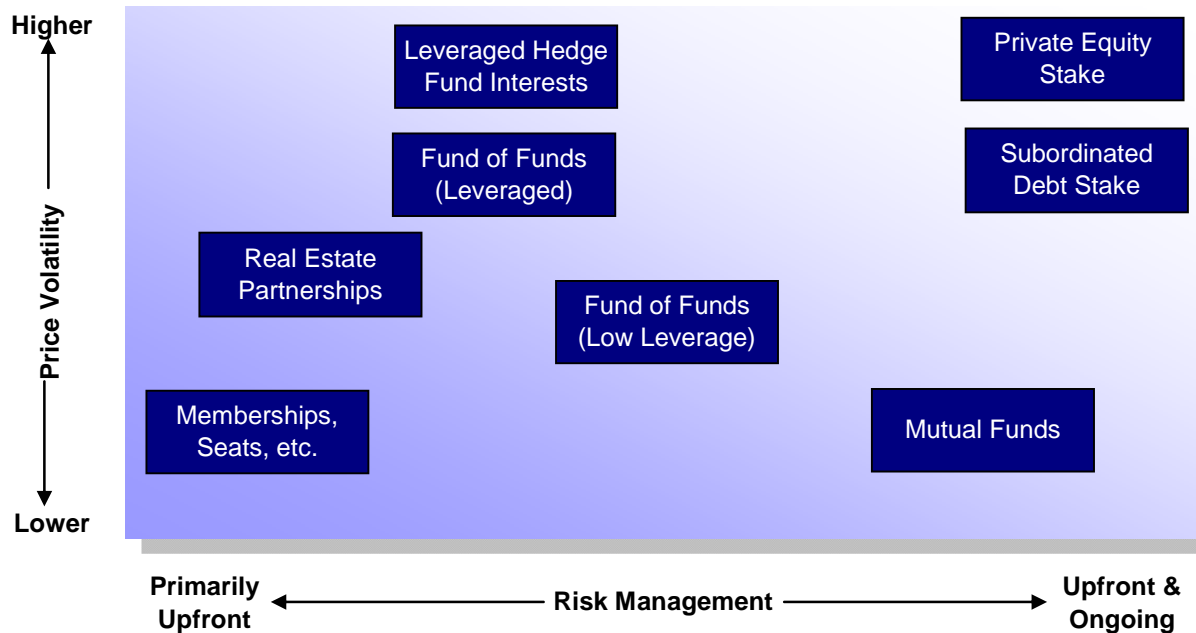
Morgan Stanley Real Estate is made up of three divisions—Real Estate Investment Banking, Real Estate Investing, and Real Estate Lending. The focus of this cross-firm project is the Real Estate Investing division, which is the largest manager of institutional real estate funds, with \$49 billion in AUM as of year-end 2006. However, as shown in the table above, Morgan's own investment in these funds was only \$608 million. As of March 31, 2007, these real estate funds increased to \$56 billion in AUM.

#### Risk Management

David Russo pointed out that while the Market Risk Department (MRD) is actively involved with risk monitoring and management for MSPI (which resides within ISG), MRD has little to no touch on risk management for MSIM (which is primarily risk managed by the MSIM Global Risk & Analysis group). The Global Risk & Analysis group is headed up by Ken Winston who reports dually to Owen Thomas (Asset Management) and Tom Daula (Risk Management).

Additionally, because the risk characteristics exhibited by the different types of private equity and principal investments vary significantly, so to does the level and frequency of risk management. As shown in the chart below, at one end of the spectrum are memberships or seats on trading exchanges that primarily entail upfront due diligence, but very little ongoing risk management. At the other end of the spectrum are private equity investments that exhibit high price volatility and require daily risk management.

<sup>25</sup> Other CSE firms such as Bear Stearns and Lehman Brothers stated that one of the riskiest principal investments is to provide bridge equity to firms or private equity funds with no track record.



MSPI Risk Management

*Risk Governance* – MSPI risk management begins at deal origination where asset acquisition requires approval of all relevant governing committees. MSPI investments under \$50 million require a sponsorship by Mitch Petridge whereas investments over \$50 million require the approval of the Institutional Securities Principal Investments Committee. The principal investments committee is chaired by Neal Shear, Head of Fixed Income, and is comprised of 13 voting members. The 13 members are senior managing directors across Firm Management, IBD, FID, and IED. There are two types of meetings that take place at this level. The first is more of an informal type of meeting where the business presents their idea for preliminary approval. If approved, the idea goes to the full 13 member committee for approval.

Significant acquisitions and investments require the approval of the Capital Structure and Strategic Transactions committee which is chaired by John Mack and includes Zoe Cruz, B. Scully, Tom Daula, David Sidwell, T. Nides, and David Wong as members. The Capital Structure and Strategic Transaction Committee reviews strategic and bolt-on acquisitions and divestitures in excess of \$250 million (e.g., Transmontaigne, Saxon, Frontpoint). Furthermore, strategic acquisitions/divestitures in excess of \$500 million are reviewed by Morgan’s Board of Directors, and the Principal Investing Committee reviews principal investments in excess of \$50 million.

*Risk tolerances and risk limits* – are set by the Firm Risk Committee which is chaired by John Mack and includes senior managers, the chief risk officer, and many of the other management committee members depending on the topic being discussed.

*Risk Reporting and Monitoring* – MRD includes principal investments in their daily risk reports, and provides weekly risk reports to the Securities Risk Committee and monthly reports to the Firm Risk Committee. While non-trading positions are not included in VaR, many principal investments (regardless of trading intent) are included in MRD’s weekly scenario analysis.

Certain investments such as seed capital, employee compensation plans, and fund ownership stakes are excluded from the risk reports and from scenario analysis.

### MSIM Risk Management

*Risk Governance* – MSIM seed capital investments are governed primarily by the MSIM Senior Management Committee with additional oversight by the Seed Capital Committee and the MSIM Risk Management Committee. The MSIM Senior Management committee reviews all new products. The committee, which meets every Monday, is chaired by the president of MSIM, Owen Thomas, and consists of his direct report heads in Equity, Fixed Income, Alternatives, Private Equity, MSIM Global Risk, Legal and Compliance, Operations, IT, Sales, Product Management, and Controllers. The new product approval process requires that all new product proposals receive signoffs by all functional areas by the Wednesday prior to Monday’s meeting, and that the Senior Management Committee has time to review the proposal and signoffs prior to the meeting.

MSIM also utilizes a Seed Capital Committee that is responsible for reviewing the outstanding seed capital and repatriates it as soon as possible. The Seed Capital Committee meets monthly and is chaired by Mary Alice Dunne, CAO of MSIM. If a product is unsuccessful, the Seed Capital Committee declares it so and closes the fund. Along with the Financial Controllers group, this committee also reviews the efficacy of the Global Risk & Analysis group’s hedging program.

*Risk tolerances and risk limits* – Similar to MSPI, risk tolerances are set by the MSIM Risk Management Committee which meets monthly.

*Risk Reporting and Monitoring* – The MSIM Global Risk and Analysis group is responsible for MSIM risk reporting and monitoring and the MSIM Risk Management Committee, which meets monthly, is responsible for reviewing the capital at risk in detail (including hedging activity). The composition of this committee is similar to that of the Senior Management Committee.

*Hedging* – Because MSIM is primarily a fee based and not capital appreciation based business, an important aspect of risk management for MSIM revolves around hedging away as much market risk as is economically feasible. MSIM does not hedge in areas where systematic risk is difficult to pin down (e.g., FoFs where they are unable to see the underlying assets). Unhedged investments might include funds of hedge funds, funds of direct investing funds (in real estate and private equity), and hedge funds. Approximately 97% of MSIM’s equity funds are hedged, almost half of the fixed income funds are hedged, but only a small portion (roughly 10%) of alternative investments are hedged.

For equity funds, MSIM typically uses index futures and FX forwards to hedge. MSIM uses Treasury and Gilt futures, FX forwards, interest rate swaps, and inflation swaps to hedge market risk in their fixed income funds. Ken Winston’s MSIM Global Risk & Analysis group is responsible for putting on and managing the hedges.



## Capital Calculation

All private equity and principal investments receive *banking book* treatment at Morgan Stanley. Basel II “Rules for Equity Exposures” are applied to calculate capital charges as follows:

- Simple risk-weight method with 100% risk-weight applied to private equity investment less than 10% of total capital.
- Investments in legislated programs are subject to 100% risk-weight up to 10% of total capital.
- Look-through approach applies to underlying fund positions to determine capital charges.

The table below provides a breakdown by sub-category of whether or not the sub-category is included for the 10% materiality threshold, what the risk-weight is for items below the threshold, and what the risk-weight is when above. All positions are currently below the 10% threshold; therefore receive a 100% risk-weight with the exception of items listed above.

Category	Sub-Category	Included for Materiality Threshold	Risk Weight	
			< 10% Limit	> 10% Limit
Business Facilitation	Private Equity Funds	Yes	100%	300-400%
	Real Estate Funds	Yes	100%	300-400%
	Other Asset Management Seed Capital	Yes	100%	300-400%
	Industry Utilities	No	100%	300-400%
	Exchange Memberships	No	100%	N/A
	Structured Investments	No	AIRB	N/A
	Community Development Credits	Yes	100%	N/A
	Community Investments	Yes	100%	300-400%
	Other	Yes	100%	300-400%
Principal Investments	Equity	Yes	100%	300-400%
	Debt	Yes	100%	300-400%
Employee Compensation Plans		-	-	-
Other Investments		No	100%	N/A

*Unfunded Commitments* – Unfunded ISG investments/private equity commitments totaled \$239 million and \$985 million as of May 31, 2007 and November 30, 2006, respectively. According to the firm, capital charges are not applied to unfunded investment commitments since there is no risk assigned to the unfunded amounts prior to the investment. Accordingly, these commitments are not applied towards the 10% threshold.

*Materiality Threshold* – MS excludes certain positions when calculating the materiality threshold. Joe gave the following reasons for the exclusions:

1. Industry utilities (\$481 million as of November, 2006) – Morgan believes that paragraph 352 in Basel II provides an exclusion because the investment has a long-term holding period, is part of long-term customer relationship, and there is no anticipation of short-term capital gains. Paragraph 352 is part of the PD/LGD approach, as opposed to the “Simple risk-weight Method,” which is a market based approach and not a PD/LGD approach. Basel II lays out the following options for calculating risk weighted assets for equity exposures:
  - (i) Market based approaches
    - a. Simple risk-weight method (Morgan’s method)
    - b. Internal models method
  - (ii) PD/LGD approach

Paragraph 351 clearly states that paragraph 352 (and 353) apply under the PD/LGD approach (see the excerpt below). The paragraph also says that the risk weights outlined in 352 are “minimum” risk weights, not risk weights that can be used in lieu of the higher 300% and 400% risk weightings as Morgan Stanley’s application does.<sup>26</sup>

351. Under the PD/LGD approach, minimum risk weights as set out in paragraphs 352 and 353 apply. When the sum of UL and EL associated with the equity exposure results in less capital than would be required from application of one of the minimum risk weights, the minimum risk weights must be used. In other words, the minimum risk weights must be applied, if the risk weights calculated according to paragraph 350 plus the EL associated with the equity exposure multiplied by 12.5 are smaller than the applicable minimum risk weights.

2. Exchange memberships (\$23 million) – are not considered private equity investment by Morgan Stanley. They are instead treated as other assets and applied a 100% risk weighting.
3. Structured investments (\$1.6 billion) – are private equity investments in funds with no material liabilities. Examples include investment in funds which only invest in third-party debt securities. Morgan applies look through treatment using paragraph 360 of Basel II as justification—since the fund has no material liabilities, can look-through to the fund’s component holdings to determine capital charges.

360. Holdings in funds containing both equity investments and other non-equity types of investments can be either treated, in a consistent manner, as a single investment based on the majority of the fund’s holdings or, where possible, as separate and distinct investments in the fund’s component holdings based on a look-through approach.

4. Employee Compensation plans (\$325 million) – are investments in firm sponsored deferred compensation plans established by the firm for the benefit of Morgan Stanley employees. Morgan’s justification is that, for the most part, these plans are risk neutral because offsetting liabilities to the investments exist and the risk is borne by employees. Investments in excess of employee liabilities are risk weighted accordingly and include in the materiality threshold.
5. Other investments (\$124 million) – primarily consist of Cap Trust units or common equity investments in Trusts issuing preferred securities—these account for \$122 million of the \$124 million in other investments. Morgan Stanley, per Federal Reserve Final Rule dated April 2005, deducts common equity from tier 1 capital; hence, excludes these balances from capital charges. The remaining other investment balances receive a 100% risk weighting.
6. Legislative Programs investments – include \$372 million in community development credits and \$77 million in community investments. Morgan cites paragraph 357 of Basel II as justification. The firm applies a 100% risk-weight up to 10% of total tier 1 and tier 2 equity.

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<sup>26</sup> Additionally, paragraph 352 does not say anything about exempting industry utilities from the materiality threshold. See the Appendix for the Basel II “Rules for Equity Exposures.”

*Potential changes in capital treatment* – In addition to the exceptions/exclusions listed above, Joe D’Auria also pointed out various areas where Morgan is rethinking their current capital treatment.

1. Real Estate Funds (\$608 million) – represent partnership (GP and LP) interests in funds that invest in portfolios of real estate assets. MS is contemplating (1) applying a look-through treatment or (2) treating this investment as income producing real-estate (IPRE) per paragraph 226 of Basel II. I am unclear whether or not a look-through approach applies (they may be able to make a case), but I am fairly certain that applying paragraph 226 is a stretch. Paragraph 226 states the following:

226. Income-producing real estate (IPRE) refers to a method of providing funding to real estate (such as, office buildings to let, retail space, multifamily residential buildings, industrial or warehouse space, and hotels) where the prospects for repayment and recovery on the exposure depend primarily on the cash flows generated by the asset. The primary source of these cash flows would generally be lease or rental payments or the sale of the asset. The borrower may be, but is not required to be, an SPE, an operating company focused on real estate construction or holdings, or an operating company with sources of revenue other than real estate. The distinguishing characteristic of IPRE versus other corporate exposures that are collateralized by real estate is the strong positive correlation between the prospects for repayment of the exposure and the prospects for recovery in the event of default, with both depending primarily on the cash flows generated by a property.

An equity investment in a real estate fund does not feel like providing funding to real estate. Additionally, paragraph 219 lists the following characteristics that must be met to qualify as specialized lending (SL), which is what IPRE falls under. Paragraph 220 establishes the fact that this section is applicable to specialized lending such as IPRE.

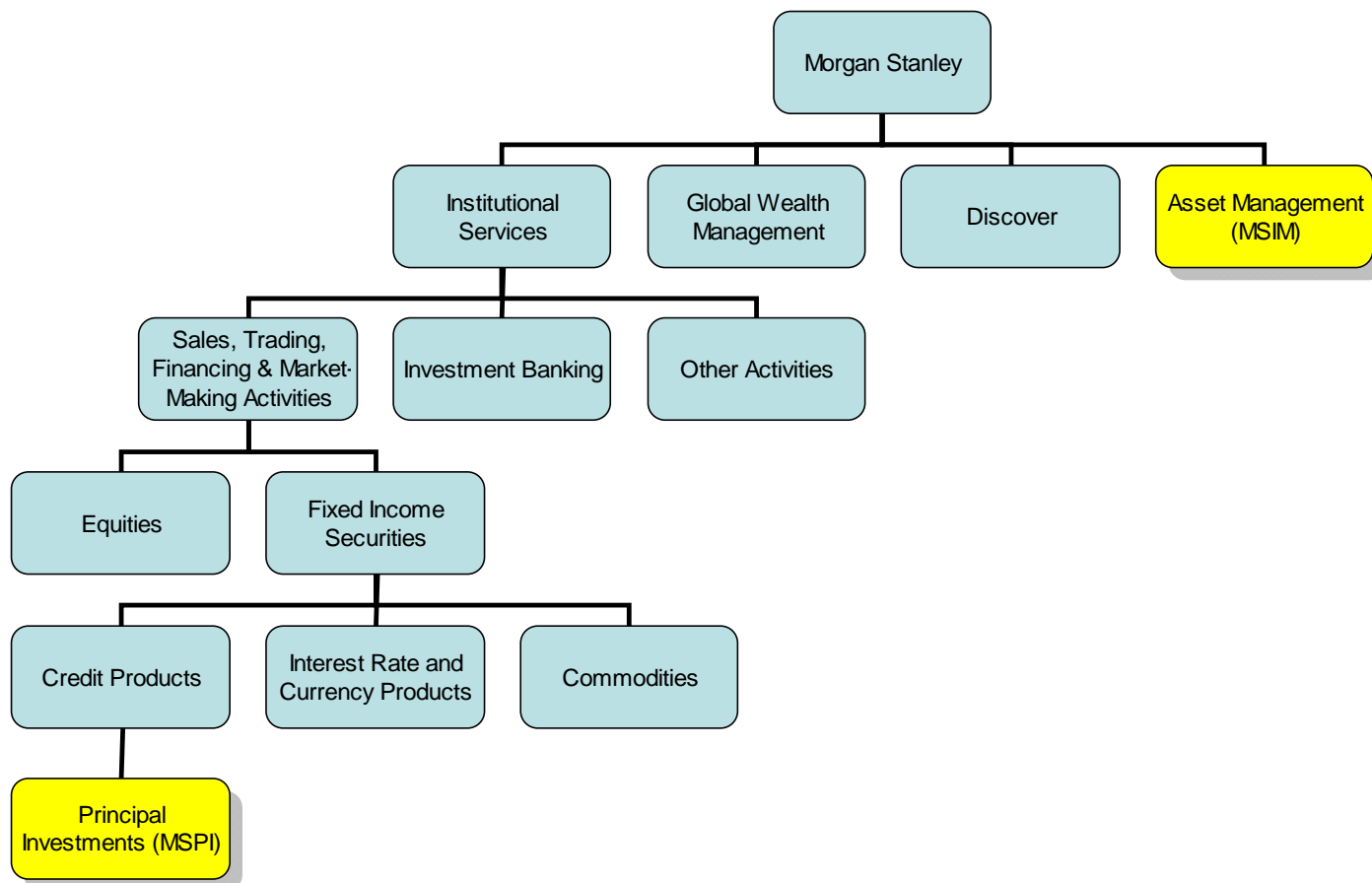
219. Within the corporate asset class, five sub-classes of specialized lending (SL) are identified. Such lending possesses **all** the following characteristics, either in legal form or economic substance:

- The exposure is typically to an entity (often a special purpose entity (SPE)) which was created specifically to finance and/or operate physical assets;
- The borrowing entity has little or no other material assets or activities, and therefore little or no independent capacity to repay the obligation, apart from the income that it receives from the asset(s) being financed;
- The terms of the obligation give the lender a substantial degree of control over the asset(s) and the income that it generates; and
- As a result of the preceding factors, the primary source of repayment of the obligation is the income generated by the asset(s), rather than the independent capacity of a broader commercial enterprise.

220. The five sub-classes of specialized lending are project finance, object finance, commodities finance, income-producing real estate, and high-volatility commercial real estate. Each of these sub-classes is defined below.

2. Asset management seed capital – Morgan has \$330 million in externally priced funds that have liquidity, invest in public securities, and provide frequent valuation [Follow up to get a sense of how liquid the shares are, what the investments are, and how frequently they are valued.] Morgan proposes treating these fund shares similar to mutual fund investments, which are subject to VaR treatment.
3. Business facilitation (other) – are listed equity positions, approximately \$43 million, that Morgan says are marked-to-market with frequent price information; hence, the firm proposes applying VaR treatment.
4. Principal investments – with and without restrictions that are marked-to-market and have frequent price information (approximately \$380 million of \$1.8 billion total).

Exhibit 1: Private Equity and Principal Investment Organizational Chart



## APPENDIX D: LEHMAN BROTHERS

### Business Overview

Until recently, Lehman Brothers' principal investments consisted primarily of commercial real estate and private equity. More recently, the Firm began providing seed capital to the Firm's Asset Management platform and began making strategic minority stake investments. In October of 2006, Lehman reaffirmed their commitment to principal investments by appointing Dave Goldfarb to the position of Global Head of Strategic Partnerships and Principal Investing. Mr. Goldfarb's responsibilities include oversight of Mergers & Acquisitions and Strategic Joint Ventures, Strategic/Corporate Principal Investments, and Proprietary Trading. The Firm believes that the appointment allows the principal investment businesses to leverage off of global relationships.

Lehman's Principal Investing businesses includes LB Private Equity, LB Asset Management Seed, Strategic Minority Stakes, and Corporate Investments.

- *LB Private Equity* creates funds and invests in asset classes where they have strong capabilities, proprietary deal flow, and a good reputation. The business invests the Firm's capital with clients' investments utilizing investment partnerships that manage the private equity portfolios. LB Private Equity asset classes include Merchant Banking, Venture Capital, and Real Estate.
- *LB Asset Management* – Through a variety of distribution channels, LB Asset Management provides proprietary asset management products, across traditional and alternative asset classes, to individual and institutional clients. Lehman Brothers typically provides seed capital to Asset Management investments.
- *Strategic Minority Stakes* consist of minority stake investments in hedge funds.
- *Corporate Investments* are principal investments and/or Limited Partnership ("LP") investments in third-party funds.

The basic theme we heard at Lehman, including from Dave Goldfarb, was that growing the Principal Investing businesses is a priority at Lehman. This is evident by the year-over-year ("YOY") growth displayed in the table below. From the 1<sup>st</sup> quarter of 2006 through the 1<sup>st</sup> quarter of 2007, Principal Investing grew by 173% (or \$3.1 billion) to end the quarter at \$4.9 billion. All four Principal Investing businesses contributed to the significant growth.

(\$ in millions)

Principal Investing	Q105	Q106	Q107	% of Total (as of Q107)	YOY Change (Q105 to Q106)*		YOY Change (Q106 to Q107)	
					in \$	in %	in \$	in %
Private Equity	1,443	1,105	2,617	54%	-338	-23%	1,512	137%
Asset Management Seed	206	359	1,078	22%	153	74%	719	200%
Strategic Minority Stakes	0	88	420	9%	-24	-21%	332	377%
Corporate Investments	95	236	762	16%	141	148%	526	223%
<b>Total Principal Investing</b>	<b>\$1,744</b>	<b>\$1,788</b>	<b>\$4,877</b>	<b>100%</b>	<b>\$44</b>	<b>3%</b>	<b>\$3,089</b>	<b>173%</b>

\* For Strategic Minority Stakes, year-over-year change is Q205 to Q106, not Q105 to Q106, due to the lack of investment in the 1st quarter of 2005.

Part of Principal Investing's growth plan is for Dave Goldfarb to ensure that investments are well diversified so the business can maintain a very low level of concentration risk. The Firm feels that the keys to achieving this are to create more investment funds and to ensure that the framework and infrastructure are properly in place to support the increase in capacity. Steven Berkenfeld, Managing Director Chief Investment Officer, pointed out that the framework surrounding investment evaluation has three primary objectives—meeting obligations to LPs, protecting client relationships, and heightening efficiency. Mr. Berkenfeld also noted that Lehman is focused on attractive risk-adjusted returns (with a targeted minimum return of 15%), strategic objectives that help the Firm deploy capital in a partnership manner, and/or for relationship management purposes where, in addition to growing Principal Investing, the relationship will also drive Prime Brokerage, Fixed Income, and Equity.

*Meeting obligations to LPs* – One of the primary objectives under this framework is to ensure that obligations to the LPs in their Private Equity funds are fulfilled. Lehman Brothers' Private Equity relationships with LPs are governed by the Limited Partnership Agreement for each fund. This document sets forth the requirements for the General Partner (an affiliate of Lehman Brothers) in terms of its relationship and fiduciary responsibilities with respect to the Limited Partners. In addition, certain LPs will negotiate side letters that contain covenants and conditions that go beyond the terms of the Limited Partnership Agreement.

*Protecting client relationships* – Beyond meeting obligations to LPs, the Firm is also concerned with protecting client relationships by making investment decisions as quickly as possible and enhancing the certainty of the decision. The objective is to avoid stringing clients along by giving them an early read that they can reasonably rely upon.

*Heighten efficiency* – The Firm is seeking to improve efficiency by clearly identifying which part of the Firm will be allowed to invest as assets are identified. One deal team will be designated to lead each investment with other parts of the Firm piggybacking as needed. The deal team is responsible for performing due diligence, conducting analysis, executing the deal, and monitoring and monetizing the investment. Lehman feels that this is more efficient than having multiple deal teams conducting the same work. To improve efficiency further, management is also focused on increasing the clarity surrounding the internal approval process.

### Investment Approval Process

The governance structure at Lehman Brothers relies heavily on committees to review and approve principal investments. The process that is undertaken for approval depends on whether the investment is for Lehman funds or principal positions; or if the investment is a minority stake, joint venture, or acquisition.

*Investments for LB funds and principal positions* require screening and approval by two committees—the Private Equity Screening Committee (“PESC”) and the Investment Committee (“IC”). First, deals are reviewed by a Private Equity Screening Committee. Each Lehman Brothers Private Equity Fund has a Screening Committee, consisting of the principals of the fund and personnel with expertise in the given asset class, that review every potential investment, including the risks, returns, and due diligence conducted. The investment must be approved by

the Screening Committee before proceeding to the second phase in the approval process, review by the Investment Committee.

Lehman's Investment Committee reviews and approves all non-public, equity, principal investments that are expected to be held for more than one year either because they do not have short-term liquidity (e.g., there is a lack of secondary market trading or there are trading restrictions), or because the Firm's intent is to hold the investment for an extended period of time. The Investment Committee does not review the Firms' proprietary trading activities or individual Lehman asset management seed positions. The Investment Committees authority is delegated to it by Lehman's Executive Committee.

Proposed investments for a Lehman Brothers Private Equity Fund generally are reviewed by the relevant Private Equity Screening Committee and by the Investment Committee. For some investments in certain asset classes, the review may, however, be handled by a summary memo rather than by a full memo and meeting. In addition, there are some smaller and more liquid investments made by certain funds (such as the MLP Fund), usually from secondary trading activities, that do not require any pre-approval from Committee.

All principal investment opportunities go through two allocation processes before they are presented for Committee approval. The first allocation decision is whether an investment should go to Lehman's private equity funds, or to the Firm. This decision is made by Dave Goldfarb and Steven Berkenfeld based on obligations to LPs in private equity funds and other relevant investment criteria such as risk adjusted return and return on equity. Other considerations that factor into the allocation process include (1) who sourced the deal, (2) which group has the best expertise to execute the deal, and (3) who is best suited to assist with the analysis and due diligence. If an investment is too big for any one fund, then the investment will be allocated to multiple funds or between private equity funds and the Firm.

Generally, Lehman Brothers Private Equity Funds target an IRR of 20% or higher on behalf of investors. Some investments, however, may still be attractive to the Firm on a risk adjusted basis even though falling below this IRR target of 20%. Thus the Firm may choose to take on investments that fall within an IRR range of 16-20%, but generally will not take on investments that fall below such a threshold unless they are undertaken for strategic or relationship reasons. Investments also have to be a good fit for Lehman's private equity funds as dictated by their very specific limited charters. Examples given by the Firm of assets that do not fall within these charters include Private Investments in Public Equity<sup>27</sup> ("PIPEs") and aviation investments.

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<sup>27</sup> PIPEs are privately issued equity or equity-linked securities that are sold to accredited investors under Regulation D by public companies. Generally, private investment firms, mutual funds or other qualified investors purchase stock in a company at a discount to the current market value per share for the purpose of raising capital. There are two main types of PIPEs - traditional and structured. A traditional PIPE is one in which stock, either common or preferred, is issued at a set price to raise capital for the issuer. A structured PIPE, on the other hand, issues convertible debt (common or preferred shares). PIPEs are popular due to the relative efficiency in time and cost compared to more traditional forms of financing such as secondary offerings. In a PIPE offering, there are less regulatory issues with the SEC and there is also no need for an expensive road show, lowering both the costs and time it takes to receive capital. PIPEs are great for small- to medium-sized public companies that have a hard time accessing more traditional forms of equity financing.



Investments allocated to private equity funds undergo additional scrutiny to determine the fund best suited to place the asset in (i.e., is the asset best suited for a merchant banking fund, venture capital fund, fund-of-funds/secondary fund, co-investment fund, or a mezzanine fund). After this allocation decision is made, due diligence and analysis is conducted by the appropriate deal team and the investment is sent to the Private Equity Screening Committee.

If an investment opportunity is allocated to the Firm (as opposed to being allocated to a Lehman private equity fund), the exposure is either syndicated out or is held on the Firm's balance sheet as a principal investment. If the determination is made to keep the asset as a principal investment, then a deal team is assigned and due diligence and analysis will be conducted prior to sending the investment to the Investment Committee for approval.

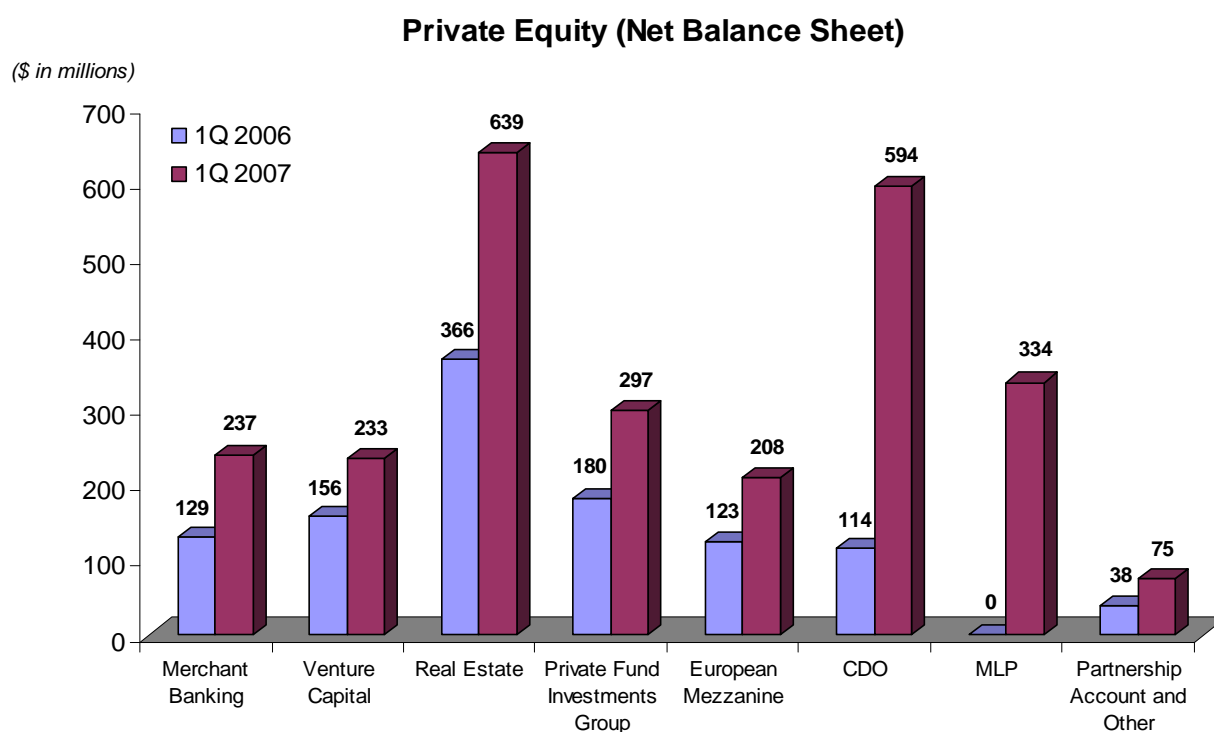
*Minority stakes in hedge funds, joint ventures, and strategic acquisitions* do not go to the Investment Committee for approval. These investments are reviewed and approved by the Strategic Acquisition Review Committee ("SARC") whose objective is to ensure that the Firm fully understands the potential issues that may arise in connection with a strategic transaction. The mandate of the Committee is to review the risks the transaction raises for the firm (i.e., reputation, legal, regulatory, market, counterparty, tax, and operational risk); to review the due diligence; and to review and assess the specific terms of the transaction. The SARC is comprised of members of senior management across multiple areas of the Firm. The due diligence and culminating presentations to the committee are typically made by an Investment Banking/Business team. The committee itself is composed of the Co-Chief Administrative Officers of the Firm as well as senior members of Legal, Risk Management, Corporate Strategy, Finance and Corporate Audit. The Committee is chaired by the Global Head of the Corporate Advisory Division.

## Principal Investing Lines of Business

As previously mentioned, Lehman has four Principal Investing businesses—Private Equity, Asset Management Seed, Strategic Minority Stakes, and Corporate Investments.

### Private Equity

Private Equity is the largest of Lehman’s Principal Investing businesses with \$2.6 billion in net balance sheet as of February 28, 2007. The graph below shows quarter end net balance sheet amounts as of the end of the 1<sup>st</sup> quarter of 2006 and 2007. All areas within the business contributed to Private Equity’s recent growth, but the largest contributor, in dollars and percentage growth, was Collateralized Debt Obligations (“CDOs”), which increased by \$480 million to \$594 million from the end of 1Q 2006 through 1Q 2007.



The Private Equity division is headed up by Michael J. Odrich, Global Head of Private Equity, and consists of 345 employees spread across eight offices. Globally, Private Equity manages a number of private equity portfolios, and has more than \$12.6 billion in assets under management invested in five main asset classes—Merchant Banking, Venture Capital, Real Estate, Private Funds Investments, and Credit Related Investments (i.e., European Mezzanine, CDO, and MLP).<sup>28</sup> The “Partnership Account and Other” consists primarily of Lehman employees’ investments in diversified pools of private equity assets.

<sup>28</sup> Business descriptions listed below are from Lehman’s web-site.

**Lehman Brothers Merchant Banking** manages funds that seek long-term capital appreciation through direct investments in established operating companies in partnership with management. The funds look to invest in companies with sound business fundamentals, proven operating teams and a compelling business strategy or vision. The Lehman Brothers Merchant Banking Group prefers to retain control over critical governance decisions in the companies in which it invests, regardless of ownership percentages, through board representation or ownership rights.

The Group was established in 1986 to achieve significant long-term capital appreciation through investments in private equity and equity-linked securities. Today, the team has over 30 investment professionals with offices in New York and London. Since 1986, Lehman Brothers Merchant Banking has raised and managed three institutional funds and several employee investment vehicles, with committed capital in excess of \$4.7 billion.

Lehman Brothers Merchant Banking Partners III L.P. is the Merchant Banking Group's current fund. The fund closed successfully in July 2005 with over \$1.2 billion of capital commitments from institutions, high net worth individual investors, and Lehman Brothers, its affiliates and employees.

**The Venture Capital Group** manages funds that focus on making investments in companies they believe are capable of turning innovative technology and management solutions into successful businesses, primarily in the technology and healthcare industries. The Group's primary investment focus is on mid- to later-stage privately held venture companies, as well as growth investments in more mature operating businesses. Venture Capital will make opportunistic investments in earlier stage companies with limited technology development risk.

Lehman Brothers launched its formal venture capital investment program in 1995. Lehman Brothers' Venture Capital has approximately \$1.1 billion in total committed capital to date, with \$717 million invested to date in 84 portfolio companies across a diverse range of industries and geographies.

The Venture Capital Group maintains offices in New York and Silicon Valley.

**The Real Estate Private Equity Group** is a full-service real estate merchant banking business which operates two opportunistic equity funds aggregating \$4.0 billion of equity capital and one mezzanine investment fund aggregating \$1.1 billion of equity capital. The funds are an extension of Lehman Brothers' global real estate franchise which advises, underwrites and invests and has participated in over \$125 billion of real estate transactions since 2000. The funds are invested and managed by a team of approximately 80 people in North America, Europe and Asia, and are headed up by managing directors and group heads, Raymond Mikulich and Mark Walsh.

Lehman Brothers' inaugural real estate private equity fund, Lehman Brothers Real Estate Partners (LBREP I), closed in 2001 with over \$1.6 billion in aggregate commitments and is now fully invested. Lehman Brothers Real Estate Partners II (LBREP II), a \$2.4 billion fund, closed in 2005, makes direct private equity investments in properties, real

estate companies and service businesses ancillary to the real estate industry in North America, Europe and Asia.

The group's inaugural \$1.1 billion mezzanine investment vehicle, Lehman Brothers Real Estate Mezzanine Partners (LBREM), closed in August 2005. Co-headed by Brett Bossung and Yon Cho, LBREM leverages the proprietary deal flow and origination volume of Lehman Brothers' global real estate business to invest in a broad range of mezzanine debt and other high yielding investments in real estate, primarily in the United States.

**Private Fund Investments** is made up of the Fund-of-funds group, Secondary Funds group and Co-Investment group.

The Fund-of-funds group has committed in excess of \$2.2 billion to more than 270 private equity funds, which in turn have made over 7,000 investments into underlying portfolio companies. The group has raised and managed 17 private equity funds since 1981. These investment opportunities are in third-party buyout, venture capital, mezzanine and special situation funds. The investments are in outside, non-Lehman funds (e.g., a KKR fund)

The Secondary Funds group seeks to purchase high quality, seasoned private equity fund portfolios from investors desiring liquidity prior to termination of those funds. This group is essentially making a one way buy and hold market. This is a growing business that is approximately equal to 5 percent of the primary market based on volume of annual transactions.

The Co-Investment group seeks to achieve superior risk-adjusted returns through investing in transactions led by premier private equity firms. These are essentially minority positions in buyout transactions. If there is a question as to whether an investment falls within this group or within Merchant Banking, Merchant Banking gets to look at the deal first.

**Credit Related Investment** activities include investments in collateralized debt obligations (CDOs) and European mezzanine debt. These funds invest in securities with equity-like returns and attractive risk/return characteristics.

The CDO Opportunity Fund invests in collateralized debt obligations, instruments created when asset-backed structuring technology is applied to a portfolio of credit exposure, such as bank loans or bonds. The Fund seeks to combine the credit market expertise and analytics of the Firm's fixed income franchise with the investment process and client relationships of the Private Equity business to seek current income and substantial total return performance.

Lehman Brothers CDO Investments Group makes investments in collateralized debt obligations, with specific expertise in the equity tranches of CDO transactions. The CDO Investments Group seeks to maximize long-term returns by investing in diversified portfolios of fixed income securities exhibiting strong relative value and managed by

premiere asset managers. In addition, the Group seeks to maximize returns by opportunistically investing in CDO transactions across all levels of the capital structure, and in certain cases, employing additional financial leverage.

The European Mezzanine Fund leverages Lehman Brothers' fixed income franchise to invest in privately negotiated mezzanine debt opportunities in Europe. The Fund's investment goal is to invest in established operating companies with dominant market positions, unique franchises, sound business fundamentals, and strong management teams.

Established in 2002, the European Mezzanine Investments Group invests capital in mezzanine loans and PIK notes. In 2004, the Group completed the raising of the €750 million Lehman Brothers European Mezzanine Fund which invests in opportunities that typically offer a high contractual yield and an additional return component consisting of warrants whose value is related to the equity value of the company. European mezzanine and PIK securities have principally been used by private equity funds to help finance leveraged buyouts but are increasingly being used as expansion and acquisition capital and to finance recapitalizations.

The Master Limited Partnership Fund is an approximately \$700 million fund that was launched in 2007. The MLP Fund focuses on investing in equity interests of Master Limited Partnerships ("MLPs") and similar entities. The investments are predominantly Private Investments in Public Entities ("PIPEs") and selected pre-IPO investments as well as investments in publicly traded MLPs. The MLP Fund has a more liquid investment strategy than other traditional Lehman Brothers Private Equity products. Additionally, third party investors have liquidity rights semi-annually after an initial lock-up period of two years. The MLP Fund will also accept new capital on a quarterly basis.

Through various funds, Lehman acts as both General Partner ("GP") and as an investor. As GP, Lehman manages the investments and is liable for the actions of the partnership. Lehman receives management fees of 1 to 2 percent of capital contributed, and generally receives 20 percent of profits generated on funds in the form of performance fees. The performance fees are typically only paid when profits are in excess of a "preferred return hurdle" to investors.

### Asset Management Seed

Asset Management Seed funds are long only, proprietary Lehman products. These are basically funds where Lehman provides seed capital to develop track records and to achieve critical mass. This industry has historically required a three year performance track record for a product to be successfully marketed. The amount of seed capital required to establish the track record varies depending on the strategy, but the idea is to show investors that Lehman has skin in the game. The minimum level of capital is often determined by the underlying transaction sizes and fixed costs associated with setting up the fund. Once the fund is successful marketed, Lehman's intent is to reduce or eliminate the amount of seed capital held in the fund.

The funds currently invested in by Lehman Brothers Asset Management Seed include:

- Europe Quantitative Funds – are French domiciled funds that use market structure-driven, factor-based models as a means to create more efficient exposures to underlying asset classes and geographies with lower volatilities and improved information ratios. Liquidity on these funds is daily.
- Liberty View Funds – are onshore and offshore single manager hedge funds that offer alternative investments designed to produce the highest absolute rate of return for a given level of risk regardless of market trends. Liberty View Funds LP is a Cayman Islands limited partnership with voting control vested in its General Partner, Neuberger Berman Asset Management, LLC ("NBAM"). NBAM is a subsidiary of Neuberger Berman, Inc., which is a wholly-owned subsidiary of Lehman Brothers Holdings Inc. These funds allow monthly subscriptions and redemptions and typically include six month lock-ups. Liberty View primarily invests in fixed income, equities and associated derivatives. A small percentage of the portfolio may also be invested in private equity and commodities. Foreign exchange is used for hedging purposes and not associated with any active strategy.
- Alpha Funds – are long only fixed income and equity funds. These funds have daily liquidity.
- Neuberger Berman ("NB") Funds – are open and closed end equity, fixed income, and international strategy mutual funds. These funds have daily liquidity.
- LBAIM (FOF) Funds – are proprietary, multi manager, funds that seek long-term capital appreciation while attempting to reduce risk and volatility. Each LBAIM fund invests in hedge fund with slightly different strategies. These funds typically have monthly subscriptions with quarterly or annual redemptions.
- Satori Funds – are funds that seek long-term capital appreciation by investing in the equities of technology and technology related industries. These funds have monthly subscriptions and quarterly redemptions.
- US Quantitative Funds – are managed using forecast-driven, fundamental factor based models. The funds seek to take advantage of opportunities in global stock, bond and currency markets by making relative value plays using a quantitative process. The funds employ global macro and market neutral strategies, and have monthly subscriptions and redemptions.
- CDO Equity – CDO Equity is investment in various classes of securities of collateralized debt obligations, collateralized loan obligations and other structured finance instruments. Eligible investments include both rated and non-rated securities. Rated securities include those rated investment grade and those rated below investment grade.

The table below shows the amount of seed capital provided to each of the fund types. As of 1<sup>st</sup> quarter end 2007, Quantitative Funds accounted for the largest portion of seed capital investment at 35% of total Asset Management seed capital. In 2006 and the 1<sup>st</sup> quarter of 2007, Lehman Brothers also increased the seed capital significantly in two other funds—Liberty View Funds and Alpha Funds.

## Asset Management Seed (Net Balance Sheet Amounts)

(\$ in millions)

Asset Management Seed	Q105	Q106	Q107	% of Total (as of Q107)	YOY Change (Q105 to Q106)		YOY Change (Q106 to Q107)	
					in \$	in %	in \$	in %
Quantitative Funds	0	0	378	35%	0		378	
Liberty View Funds	40	104	226	21%	64	160%	122	117%
Alpha Funds	0	33	185	17%	33		152	461%
NB Mutual Funds	62	78	86	8%	16	26%	8	10%
LBAIM (FOF) Funds	30	35	84	8%	5	17%	49	140%
Satori Fund	49	61	63	6%	12	24%	2	3%
Global Macro Fund	25	28	27	3%	3	12%	-1	-4%
Market Neutral Fund	0	20	24	2%	20		4	20%
CDO Equity	0	0	5	0%	0		5	
<b>Total Asset Management Seed</b>	<b>\$206</b>	<b>\$359</b>	<b>\$1,078</b>	<b>100%</b>	<b>\$153</b>	<b>74%</b>	<b>\$719</b>	<b>200%</b>

*Capital Request Oversight* – Capital requests for Asset Management Seed capital are submitted to the Investment Management Department Capital Management Team (“IMD CMT”), which evaluates the request and makes a recommendation to the IMD Executive Committee who approves or disapproves the request. The IMD CMT is led by Andrew Komaroff, the head of Asset Management Seed, and includes representatives from Finance, Risk Management, and IMD Strategy. Capital requests are evaluated for business purpose, operational and risk management, and length of commitment. The capital request process is accountable to, and overseen by, Dave Goldfarb, the Global Head of Principal Investing.

*Capital Risk Oversight* – IMD CMT is responsible for oversight, which includes risk monitoring and reporting, of seed capital positions while Global Risk Management reviews seed positions daily. Risk Management calculates risk levels for fund investments using a “look-through” process when feasible. The firm uses the look-through process for approximately 47% of asset management seed capital. Where full look through is not used, either historical volatility of the fund or a proxy is used, which are used on 40% and 13% of seed capital respectively.

Risk limits for seed capital investment are established in alignment with Lehman’s overall risk appetite methodology. Risk Appetite limits for the four Principal Investing businesses (Private Equity, Asset Management Seed, Strategic Minority Stakes, and Corporate Investments) are monitored on two levels: IMD (Investment Management Division) and Direct Principal Investments—\$800 million at the IMD level and \$190 million on Direct Principal Investments.

To mitigate systematic risk, Lehman puts on index hedges when it is appropriate. The Firm has not historically hedged below the macro level, but is looking to put on hedges where there are single investment strategies that they can get simple hedges for. For example, they might use simple index hedges to mitigate exposure in a high-yield macro hedge fund.

### Strategic Minority Stakes

Lehman Brothers views Strategic Minority Stakes differently than Private Equity investments in that they do not invest with an exit strategy in mind (i.e., “the investment is never purely about the cash out”). Because of this, Lehman wouldn’t pay top dollar for a Strategic Minority Stake based on an exit at some point in the future. Instead, the Firm treats, and values, these investments as a portfolio that provides revenue and diversification across various strategies and fund managers.

Total investment in Strategic Minority Stakes is relatively small compared to Private Equity and Asset Management, but the increase in the net balance from \$88 million in the 1<sup>st</sup> quarter of 2006 to \$420 million in the 1<sup>st</sup> quarter of 2007 was significant. A substantial portion of the \$420 million was made in Spinnaker Capital.

### Strategic Minority Stakes (Net Balance Sheet Amount)

(\$ in millions)

Strategic Minority Stakes	Q105	Q106	Q107	% of Total (as of Q107)	YOY Change (Q105 to Q106)		YOY Change (Q106 to Q107)	
					in \$	in %	in \$	in %
Marble Bar	0	19	89	21%	-1	-5%	70	368%
Ospraie	0	42	78	19%	-19	-31%	36	86%
GLG	0	27	27	6%	-4	-13%	0	0%
Spinnaker Capital	0	0	226	54%	0		226	
Total Strategic Minority Stakes	\$0	\$88	\$420	100%	-\$24	-21%	\$332	377%

*Spinnaker Capital* was founded in 1999 and is active in fixed income emerging markets trading across Asia, Eastern Europe, and Latin America. Spinnakers has three key products—Global Opportunity, Global Emerging Markets, and Global Strategic. The firm is headquartered in London and has \$5.4 billion in assets under management. Lehman Brothers provided \$226 million in capital to Spinnaker and, in exchange, receives 20% of profits. Lehman holds an option to invest additional capital to increase their share of profits to 25%. Through the 1<sup>st</sup> quarter of 2007, net revenue from the Spinnaker stake was a \$1 million loss for Lehman.

*Marble Bar Asset Management* is Lehman's second largest Strategic Minority Stake with \$89 million invested as of February 28, 2007. Marble uses a proprietary trading system for trade ideas and portfolio management in its long/short equity products. Marble's geographic focus includes Europe and Australia. The company is headquartered in London and has \$2.8 billion in assets under management. Lehman receives 20% of profits which amounted to \$7 million in the 1<sup>st</sup> quarter of 2007 and \$28 million in 2006.

*Ospraie Management* was launched in February of 2000 as part of Tudor Investment Corp., but became an independent business in January of 2004. As of February 28, 2007, Lehman's investment was \$78 million, and they receive 20% of profits. Ospraie is headquartered in New York, has \$5 billion in assets under management, and primarily focuses on basic industries, commodities and related sectors. Lehman received \$16 million in revenue in 2006 and \$2 million in revenue in the 1<sup>st</sup> quarter of 2007 from their Ospraie minority stake.

*GLG Partners* is Lehman's smallest minority investment at \$27 million, but because of the comparatively large size of assets under management, is more profitable than all other minority stakes. GLG Partners was founded in 1995 as a division of Lehman Brothers and restructured into a separate entity in 2000. The company is headquartered in London and is one of the largest alternative investment managers in Europe with \$15.4 billion in assets under management. GLG's key products include a Market Neutral Fund, a Global Convertible Fund, and a European Long/Short Fund. In exchange for their capital investment, Lehman receives 18% of profits. In 2006, net revenue from GLG was \$28 million, which was 39% of the total Strategic Minority



Stake revenue of \$72 million. For the 1<sup>st</sup> quarter of 2007, GLG revenue was \$15 million (accounting for 65% of Strategic Minority Stake’s total revenue).

### Corporate Investing

Lehman Brothers’ Corporate Investing encompasses three types of investments: (1) Limited Partnership (“LP”) investment in third party asset management firms and hedge funds; (2) LP investments in third party private equity funds; and (3) direct investments. Corporate Investing may be done either in conjunction with the Private Equity division, or on an independent basis. Approval for Corporate Investing goes through the Investment Committee process as outlined in the “Investment Approval Process” section above.

As can be seen in the table below, the largest Corporate Investing category (when measured by net balance sheet amount or year-over-year dollar growth) is LP Investments in Third Party Asset Management and Hedge Funds, which as of 1<sup>st</sup> quarter end 2007 had a net balance sheet amount of \$303 million (which was 40% of total Corporate Investment’s balance sheet). These investments are typically made to help launch a fund through a partnership agreement and/or to provide seed capital to previous Lehman employees seeking seed capital to start their own fund. Lehman also uses this business to gain exposure to funds in regions such as India. Current funds include Ospraie Multi Strategy Fund (a fund Lehman agreed to help launch and take a partnership in), CQS (which was done to help an ex-Lehman employee with seed capital), Taj Capital (in India), and other small funds.

#### **Corporate Investing (Net Balance Sheet Amounts)**

(\$ in millions)

Corporate Investments	Q105	Q106	Q107	% of Total (as of Q107)	YOY Change (Q105 to Q106)		YOY Change (Q106 to Q107)	
					in \$	in %	in \$	in %
LP Investment in Third Party AM and HFs	0	111	303	40%	111	NA	192	173%
LP Investment in Third Party Private Equity Funds	30	59	242	32%	29	97%	183	310%
Blue Ray Shares	0	0	65	9%	0	NA	65	NA
Pirelli Tyre	0	0	79	10%	0	NA	79	NA
Gulfmark	65	66	73	10%	1	2%	7	11%
<b>Total Corporate Investments</b>	<b>\$95</b>	<b>\$236</b>	<b>\$762</b>	<b>100%</b>	<b>\$141</b>	<b>148%</b>	<b>\$526</b>	<b>223%</b>

Most LP Investments in Third Party Private Equity funds are done in excess of FoF investments that are undertaken by the Private Equity division. For example, Private Equity might only be able to invest \$50 million into a KKR fund while KKR requested a \$75 million investment. Corporate Investing might then agree to make the remaining \$25 million investment. Investments include well know Private Equity names such as KKR, Blackstone, Carlyle Capital, Fortress, and Warburg Pincus. Decisions to invest in a third party fund are not reached purely on the basis of return. Evaluation and allocation of these investment opportunities also will be based on the rationale for the investment. In addition to attractive risk-adjusted returns, the rationale for the investment also may include strategic objectives and relationship management (including future revenue opportunities with such Fund).

Corporate Investing currently has three direct corporate investments—Blue Ray, Pirelli Tyre, and Gulfmark. Blue Ray is a publicly traded UK hedge fund in which Lehman owns shares, the

Pirelli Tyre investment is a minority stake in the Pirelli tire company, and Gulfmark investment is a direct investment in an oil services company. All three investments are carried at fair value.

### **Risk Management**

Risk Management for Principal Investing is headed up by Chris Van Buren, the Global Head of Risk Management for Investment Banking. Mr. Van Buren reports to the Chief Risk Officer, Madelyn Antoncic, and not to Lehman Investment senior management.

#### *Risk Monitoring and Management*

The primary metric for monitoring and managing risk in Principal Investing is “Risk Appetite.” The method for calculating Risk Appetite is driven by the type of principal investment and, more importantly, the level of transparency into the assets underlying the investment. Risk Appetite for all asset classes is calculated at the 95% confidence level.

For Asset Management seed capital and publicly traded stock in Private Equity funds, Lehman uses historical simulation of actual investments or underlying positions to calculate Risk Appetite. Lehman uses specific security analysis involving calculation of default loss using binomial distribution methodology for CDO and components of the European Mezzanine Fund. For Merchant Banking, Real Estate, and components of the European Mezzanine Fund, the Firm uses a Cambridge economic time series that has been adjusted to be more usable. In situations where there is no, or very little, transparency (i.e., hedge fund minority stakes, outside hedge fund LPs, JVs, and certain Private Equity holdings), Lehman uses a market volatility proxy to generally represent the risk of these positions.

Risk Appetite is monitored and managed in two major categories—Lehman Brothers Private Equity and Other Principal Investments. Other Principal Investments includes Asset Management Seed, Strategic Minority Stakes, Corporate Investments, and third party seed capital. As of November 30, 2006, total Risk Appetite for Private Equity and Other Principal Investments were \$436 million and \$117 million respectively. Of the \$436 of Private Equity Risk Appetite, \$398 million was in the Americas and \$40 million was in Europe. For other Principal Investments, \$106 million was in the Americas and \$28 million was in Europe. The Risk Appetite limit is currently set at \$650 million.

### **Capital Treatment**

For capital calculation, Lehman calculates capital based on a 100%, 300%, or 400% risk weighting. 100% risk weighting was applied to all assets purchased prior to November 30, 2005. For investments made post November 30, 2005, the Firm applies either a 300% risk weighting for direct public investments or a 400% risk weighting for non-direct public investments. The table below provides a break down, by Principal Investing type, for each of the risk weighting buckets.

Commitments to invest at some time in the future are assigned a risk weighting equivalent to 50% of the risk weighting that will be used when the commitment is funded.

(\$ in millions)

	<b>Capital Charges</b>			
	<b>100% Weight</b> (pre-11/05)	<b>300% Weight</b> (post-11/05 direct public)	<b>400% Weight</b> (post-11/05 non- direct public)	<b>Total Capital Charge</b>
LB Private Equity	\$ 126	\$ 16	\$ 397	\$ 539
LB Asset Management Seed	\$ 29	\$ -	\$ 146	175
Strategic Minority Stakes	\$ 8	\$ -	\$ 22	30
Corporate Investments	\$ 20	\$ -	\$ 88	108
<b>Total</b>	<b>\$ 183</b>	<b>\$ 16</b>	<b>\$ 653</b>	<b>\$ 852</b>

## APPENDIX E: TRADITIONAL ACCOUNTING METHODS

*Consolidation Method:* The consolidation method is generally used when the investor has the ability to exercise substantial control and direction of an entity. Commonly, this is demonstrated by acquiring over 50% ownership interest. For financial statements presentation, the investee's assets, liabilities, income and expenses are combined into the investor's balance sheet and income statement. In addition and if applicable, an offsetting entry representing the ownership of the minority investors is made within the stockholder's equity section.

*Equity Method:* The equity method is generally used when the investor has the ability to exercise significant influence over an entity but does not have the definitive decision making controls. The application of this method is normally presumed when an investor owns more than 20% interest but less than 50% interest and the investment is not publicly traded (e.g. no observable price). For financial statements presentation, the investment is recorded as an asset on the balance sheet at the purchase price. Over a period of time, the asset is adjusted upwards for its percentage of profits or downwards for its percentage of losses to approximate the investment's appreciation or depreciation. Furthermore, the share of profits and losses is immediately recognized and included in the income statement.

An additional adjustment to the asset is also made when dividends are issued. When a dividend is declared and issued, the asset is reduced for its share to reflect the reduction in the investee's book value. Since the investor has already recognized its share of the investee's profits, dividends are not recognized as part of the firm's profits and losses. Since the equity method uses the investee's financial performance as a proxy for the value of the investment, there is a possibility that the investment's accumulated losses could exceed the initial purchase price. In such a case, the investment account can not be reduced to below zero. Accumulated losses that exceed the initial purchase price are monitored off balance sheet until enough profits are realized to bring the carrying value to above zero.

*Cost Method:* The use of the cost method is generally used when the investor does not have significant influence over the investments, usually a less than 20% ownership interest. For financial statements presentation, the investment is recorded on the balance sheet at the purchase price less any adjustments made for impairments. Income is only recognized when dividends are issued.

**Event-Driven Lending  
Current Market Practice, Risk Management & Capital Treatment**

**OPSRA- Cross Firm Project**

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SECURITIES AND EXCHANGE COMMISSION  
Division of Market Regulation  
Office of Prudential Supervision and Risk Analysis  
100 F St., N.E.  
Washington, DC 20549

For Further Information:

Jim Giles 202.551.5536 [gilesj@sec.gov](mailto:gilesj@sec.gov)  
Kevin Silva 202.551.5546 [silvak@sec.gov](mailto:silvak@sec.gov)

## **EXECUTIVE SUMMARY**

### **Business Overview**

Over the past year, the growth of the CSE firms' corporate lending portfolios<sup>1</sup> has been primarily related to event-driven loans. The notional amount of such commitments as of the end of December 2005 stood at approximately \$55 billion, more than doubling the \$20 billion in exposure at the end of 2004.<sup>2</sup>

Event-driven lending consists primarily of "leveraged" bank loans made to non-investment grade counterparties, typically used for acquisitions, leveraged buyouts ("LBOs"), or recapitalizations. Leveraged loans are heavily relied upon by "financial sponsors" like KKR and Blackstone. Although fewer in number than leveraged loans, the event-driven portfolios at some CSE firms also periodically include a small number of very large transaction-related loans made to investment grade counterparties.

In contrast to other corporate lending, where the investment banks intend to hold and actively hedge the commitments, the event-driven portfolio is much more concentrated and transitory. Exposures are intended to be syndicated, sold or otherwise reduced fairly quickly. Therefore, the primary risk of a leveraged loan lies in the bank's potential inability to exit the exposure through syndication in a timely manner at current or near current spread levels. A failed syndication could result from a general credit spread widening event, a name specific spread widening, or the specific terms of a facility not being palatable to the market. Under such circumstances, the investment bank would surely face mark-to-market losses as the value of the commitment declines. In addition, if deteriorating market conditions result in the firm's inability to exit the position, the investment bank may actually have to fund the commitment, leading to further credit and liquidity risk.

In addition, providing leveraged financing may involve certain non-financial risks as well. The issuers of the debt, as distinct from the financial sponsors who arrange the deals, are typically left with highly leveraged balance sheets. Where subsequent events leave a firm unable to meet its debt obligations, the investment banks' role in these transactions may be subject to further scrutiny.

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<sup>1</sup> The corporate lending activities—which are one of the major sources of credit risk exposure at the CSE firms—are comprised of two types of activities: (1) relationship lending and (2) event-driven lending. Relationship lending typically refers to the non-economic commitments provided typically to investment grade counterparties in the anticipation of other profitable business from the counterparty.

<sup>2</sup> These numbers actually understate the entire event-driven lending pipeline due to the fact that the data provided by the firms consisted of either (1) only closed loans or (2) only accepted (signed by both parties) commitment letters, depending on the firm.

## Risk Management

The risks of event-driven lending are managed first through the upfront loan approval process, and then later through the syndication of exposures.

At all the CSE firms, the extension of an event-driven commitment requires the approval of a capital commitment committee and perhaps additional levels of senior management approval for outsized transactions based on size and rating criteria. The commitment committees are generally comprised of both business and independent control function personnel and, in all cases, independent credit risk management is represented. The loan approval will stipulate both the credit terms of the facility as well as the target hold levels which specify the generally small amount of the commitment the firm is willing to hold once the syndication process is completed. The flex terms, which allow the investment bank leeway to adjust the pricing and structure of deal even after an agreement is signed by the issuer, are a critical part of the discussion during the capital commitment committee process. Investment banks obviously seek sufficient “flex” to allow the loan commitments to “clear the market” under all foreseeable market conditions, while financial sponsors and issuers seek to restrict such flexibility.

The syndication process is the primary mechanism through which the firms reduce their risk exposure to leveraged loans. In a first stage banks bring in other banks, often at the prompting of the financial sponsors, as lead arrangers to take on some of the exposure. This is followed by a primary or general syndication, which involves lead arrangers syndicating the remaining commitments more broadly to other banks, hedge funds, and other institutional investors. If the syndication process is not completely successful in reducing the exposure to the agreed upon “hold” level, the investment bank will typically try to sell the loans in the secondary market. Alternatively, the bank may seek to actively hedge the commitment using credit derivatives. But the lack of liquidity in credit protection on these predominately non-investment grade names makes this difficult and expensive.

## Capital Treatment

The capital treatment of these event-driven lending facilities under the Basel Standard is not fully specified and, as a result, the CSE firms have adopted multiple approaches. Critical questions in deciding upon a capital treatment include the point in the lifecycle of a commitment when an investment banks begins holding regulatory capital against the exposure and whether these assets are considered to be in the “banking book” or the “trading book”. In assessing the overall conservatism of the approach used by a firm, all of these determinations must be considered. For example, a seemingly conservative approach that produces large capital charges appears less conservative when commitments are only included in the capital calculation once syndication has occurred and most exposure has been shed.

# Event-Driven Lending – Cross Firm Project

## **I. Business overview (including main risks)**

Corporate lending activities—which are one of the major sources of credit risk exposure at the CSE firms—can be broadly classified into two types of activities: (1) relationship lending and (2) event-driven lending. Relationship lending typically refers to the non-economic commitments provided typically to investment grade counterparties for liquidity purposes. These commitments come in the form of an unsecured revolving credit line, referred to as “revolvers.” Typical characteristics of a relationship lending revolver are as follows:

- Revolvers are made in the anticipation of other profitable business from the counterparty, such as advisory fees or debt/equity underwriting fees.
- Borrowers can draw down, repay, and re-borrow any or all of the credit line.
- Historically, the tenor on revolvers was 364 days but has lengthened to 3-5 years for many counterparties over the past couple of years.
- The vast majority of these commitments are unfunded.
- Revolvers (for investment grade names) are easily hedged in the single name credit default swap market.

In contrast to relationship lending, event-driven lending is intended to be profitable on a stand-alone basis. Additionally, the event-driven portfolio is much more concentrated and transitory, where exposures are syndicated, sold or otherwise reduced in a fairly quick manner. Event-driven lending consists of both (1) leveraged loans (typically used for acquisitions, LBOs, or recapitalizations); and (2) transaction-related loans (made to investment grade counterparties).

Over the past year, the growth of the firms’ corporate lending portfolios (as well as much of the focus of OPSRA’s monthly meetings with credit risk management of these firms) has been primarily related to event-driven loans, and in particular “leveraged loans” to non-investment grade counterparties.

### **A. Leveraged Loans**

Leveraged loans generally refer to bank loans made to non-investment grade counterparties.<sup>3</sup> As stated above, these facilities are generally used to either finance acquisitions or to affect a recapitalization of an existing business (typically to provide a debt-financed dividend to the owners of the corporation). A leveraged loan facility generally consists of some combination of revolvers, term loans, and/or bridge loans.

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<sup>3</sup> However, there are different ways to classify a leveraged loan. In addition to rating, one of the other often used criteria is the initial spread over LIBOR that the loan pays (e.g. a loan that bears a coupon of +125 basis points or more above LIBOR).



Most non-investment grade event-driven facilities are composed of one of the following two combinations:

- (1) A combination of (a) revolver, (b) 1<sup>st</sup> lien term loans, and (c) *a bridge to a secondary high yield bond offering*.<sup>4</sup>
- (2) A combination of (a) revolver, (b) 1<sup>st</sup> lien term loans, and (c) *2<sup>nd</sup> lien term loans*.

As previously mentioned, a revolver represents a revolving line of credit and is usually unfunded at closing. The revolver<sup>5</sup> is typically part of the facility for two reasons. First, it gives the issuer some flexibility or cushion. In some cases, the revolver may also be intended to fund capital expenditures associated with the acquisition or for future acquisitions. Secondly, the buyers of the term loans generally prefer that a revolver be included in the facility to provide the issuer with additional liquidity (i.e. cushion). Term loans are simply loans for a specific amount with a fixed tenor and a fixed repayment schedule and, unlike revolvers, term loans are generally funded at closing. Both revolvers and term loans are floating rate instruments. In addition, leverage lending term loans and the vast majority of leveraged lending revolvers are secured instruments and thus are senior to bonds in the capital structure. Secured revolvers in a leveraged lending facility are generally *pari passu* with the 1<sup>st</sup> lien term loans in the facility. These leveraged loans also include a series of covenants that put restrictions on the borrower, including the ability to assume additional debt (usually over some threshold)<sup>6</sup>. As a result of these features, in contrast to high yield bonds, leverage loans (i.e. term loans and most revolvers) provide protection from interest rate increases and better recoveries in the case of defaults. Also, based on these two characteristics, the volatility of leverage loan prices (or spreads) is much less than their HY bond equivalents.

Leveraged loans also include a series of covenants that put restrictions on the borrower, including the ability to assume additional debt (usually over some threshold).<sup>7</sup> As a result of these features, in contrast to high yield bonds, leveraged loans (i.e. term loans and most revolvers) provide protection from interest rate increases and better recoveries in the case of defaults. Because of these two characteristics, the volatility of leveraged loan prices (or spreads) is much less than their High Yield (“HY”) bond equivalents.

In the leveraged lending market, term loans can be either (1) 1<sup>st</sup> lien term loans or (2) 2<sup>nd</sup> lien term loans. Most facilities include a 1<sup>st</sup> lien term loan that may be structured into two different loans—one for banks and one for institutional clients.<sup>8</sup> The structuring into

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<sup>4</sup> While the most typical take-out for a bridge is the issuance of HY bonds (i.e. junk bonds), we have seen bridges to other take-outs such as an equity underwriting, a rights offering, and a specific asset sale.

<sup>5</sup> In the current market, the general tenor of a revolver in a leveraged lending facility is 5 years.

<sup>6</sup> The credit departments at the CSE firms will be charged with monitoring the borrower’s adherence to these loan covenants.

<sup>7</sup> The credit departments at the CSE firms will be charged with monitoring the borrower’s adherence to these loan covenants.

<sup>8</sup> In addition, there may be tranches of loans carved out for public-only investors and for those on the private side. The public-only investors may include hedge funds that are trading the debt of these

two or more 1<sup>st</sup> lien term loans allows the issuer to offer loans with different amortizing schedules and maturities to match the preference of banks and other institutional investors. The different types of 1<sup>st</sup> lien notes have generally been discussed as Term loan A<sup>9</sup> and Term loan B in our meetings with CSE credit risk management. Term A loans are packaged with revolvers to be sold to banks during the primary syndication process; whereas Term B loans are fully distributed to institutional investors.

Second lien term loans are generally the same as 1<sup>st</sup> lien notes with two exceptions. First, while they have a secured interest in the assets of the borrower, this interest is subordinate to that of the 1<sup>st</sup> lien and revolver; thus, the implicit leverage provided by these loans is greater. Secondly, to compensate for the lower position in the capital structure, the coupon on the 2<sup>nd</sup> lien will exceed that of the 1<sup>st</sup> lien.

In contrast to term loans, bridge loans are not meant to be permanent financing. As the name suggests, bridge loans represent temporary financing to “bridge the gap” to a more permanent source of funding. Typical characteristics of a bridge loan include:

- A bridge loan is usually taken out by a high yield bond offering.
- If a bridge loan is not taken out, the loan is generally a one year commitment that converts at the end of one year into a term loan (typically a 9 year term loan).
- At the time the bridge loan converts to a term loan, many onerous adjustments occur, such as the spread stepping up (usually on a quarterly basis), which would force the counterparty to issue term debt at uneconomical spreads (based on the then-current market and rating of the counterparty).

The terms give the counterparty the incentive to take out the bridge even if the market has widened substantially and/or the credit has deteriorated. With that said, if the market/name deteriorates sufficiently, the counterparty may be better off with the terms of the bridge and the bank could be stuck with a “funded bridge.”

Unlike term bank loans which are secured, the vast majority of bridge loans used for leveraged lending acquisitions are senior unsecured. Similarly, bridge loans for investment grade transactions are also unsecured<sup>10</sup>. Bridge loans also differ from term

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companies and other investors that want to buy both bank debt as well as HY bonds from the issuer. In fact, the bank meeting that kicks-off the primary or general syndication process is generally broken into two parts: (1) the first part open to both public and private side investors and (2) a second portion, where the public-only investors are excused from the meeting. In general, less than half of the participants remain for the second portion of the meeting.

<sup>9</sup> In the current market, Term A loans are typically 1 year shorter in tenor than Term B loans and priced 25 basis points tighter. The general tenor of term loans is between 5 and 7 years.

<sup>10</sup> However, unlike non-investment grade counterparties, investment grade counterparties generally don't have secured debt outstanding.

loans in that they go through a different syndication process (see risk management section below for details).

When leveraged lending facilities are used for acquisitions, the facility will generally include either a bridge loan or a 2<sup>nd</sup> lien term loan. The determination of which type of loan to use depends on market conditions and is largely a function of where the issuer (and investor base) is located. For example, while the HY bond market is not as developed in Europe as it is in the U.S., the alternative 2<sup>nd</sup> lien (or mezzanine bank loan market) is more developed in Europe. As a result, there is a tendency to see more European deals utilize 2<sup>nd</sup> lien term loans in lieu of bridge loans in an event-driven facility. In contrast, bridge loans are more prevalent in the U.S. market; however, the 2<sup>nd</sup> lien market is growing in the U.S. and appeals to investors that are precluded from investing in unsecured HY debt.

### (1) **From Corporates**

The primary leveraged loan business is generated from two sources: corporate clients and financial sponsors (with financial sponsors generating a majority of the business). Non-investment grade corporates enter the leveraged loan market for numerous reasons, but during the past year, much of the activity with direct corporate clients was generated from strategic M&A activity (e.g. E-Trade Financial Corporation (B+) \$1.6 billion bridge loan to HY debt offering to finance its acquisition of Brown & Co. during Fall 2005). Risk managers have noted that they generally have a higher comfort level with deals coming from strategic buyers (i.e. corporates). The theory being that these deals are generally much less levered than the financial sponsor deals and that the bank is typically able to negotiate better terms (e.g. flex, covenants, etc). This is especially true for corporates where they have a stronger relationship than they do with some of the larger financial sponsors. In addition to the acquisition related loans, towards the end of 2005 and into 2006, there was an increase in corporate institutions looking to adjust their capital structure to avoid becoming take-over targets.

### (2) **From Financial Sponsors**

While a portion of the leveraged lending business comes directly from corporate clients, a majority of the recent activity has been arranged through financial sponsors. Financial sponsors refer to the large private-equity or buyout firms, such as Blackstone, KKR, and others. Leveraged loans are frequently used by financial sponsors to finance acquisitions (including Leverage Buy Outs (“LBOs”) of public companies) and to recapitalize (i.e. increase leverage) existing companies and pay themselves a cash dividend (commonly referred to as a dividend recapitalization).

These financial sponsors shop across multiple banks to provide financing for their acquisitions or recapitalizations and the landscape is quite competitive. With respect to acquisition related facilities, there is even more competition because several financial sponsors may bid on the same acquisition target with each financial sponsor requesting

commitments from several banks. In fact, it is typical for a CSE firm to have financing commitments with multiple financial sponsors competing for the acquisition of a particular target. The banks can have separate “deal teams” working with the various financial sponsors to avoid “conflicts of interest” with each of these relationships commonly referred to as a “tree” (i.e. the bank may have several trees out on a particular acquisition deal). These offered (but not yet accepted) commitments by CSE firms are considered part of the Event-Driven lending pipeline.<sup>11</sup>

Over the past few years there has been tremendous growth in the number and size of private equity and buyout firms (“financial sponsors”). The glut of cash that these firms have had to invest has led to a very high level of buyout activity, which has generated a significant supply of leveraged loan commitments. The flow of financial sponsor deals was quite robust throughout all of 2005. In addition to the increase in the pace of buyout and recapitalization activity, the size (or chunkiness) of leveraged buyout deals that came to the market also increased.

There were several financial sponsor driven LBO deals larger than \$1 billion in market value during 2005 (up significantly from 2004). Two of the largest deals included the \$12 billion LBO of Sunguard by a private-equity consortium in July 2005 (which included \$4 billion in bank loans) and the \$15.1 billion LBO of Hertz later in the year. However, there were many multi-billion dollar non-investment grade commitments at several of the CSE firms during 2005, particularly in the 2<sup>nd</sup> half of the year.

## **B. Investment Grade Transaction-related loans**

While the absolute size of the event-driven lending business has been dominated by non-investment grade exposures, particularly those coming from financial sponsor deals, many of the firms have also made significant transaction-related loans to investment grade corporates involved in acquisitions. In contrast to leveraged loans, investment grade transaction-related loans primarily come from corporate clients that are looking for financing to make strategic acquisitions. From time-to-time, these investment grade transaction loans may dominate a firm’s event-driven lending exposure. The following example illustrates this point.

In November 2005, Goldman Sachs had a loan commitment to Telefonica Europe BV a financing vehicle for Telefonica S.A (A rated), the leading telecom operator in Spain and Latin America for just over \$11 billion. The financing was related to Telefonica’s \$30+ billion takeover of O2, a British cellular company. As a result, until the Telefonica facility was syndicated out, it dominated GS exposure profile and the overall investment grade vs. non-investment grade breakdown of the portfolio.

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<sup>11</sup> See the risk management and capital calculation sections for discussions on how and when firms measure and manage the risk to these commitments and at what point in the process they include these commitments in the capital calculation.

While these counterparties may be investment grade, they are typically in the BBB to A range and thus do not have much room to fall before crossing over into junk status. For example, in the case of Telefonica, post-acquisition, the name was downgraded from A- to BBB+, partially due to concerns about the aggressive use of leverage in the acquisition.

### **C. Portfolio composition**

As a result of its transitory nature, the make up, from a rating, geographical, funding status, and sector perspective, of the event-driven lending portfolio can change rather dramatically in a short period of time. Given that caveat, there are some general statements that can be made about the event-lending portfolios of the CSE firms:

- The majority of commitments have been to non-investment grade counterparties. Non-investment grade commitments represented between 57% and 79% of the total event-driven commitments (over the past year) based on quarterly data provided by the CSE firms.<sup>12</sup>
- On a firm-by-firm basis, while generally more of the event-driven lending occurs with non-investment grade names, large transaction-related deals with investment grade names, such as the Telefonica deal mentioned above, can significantly affect the make up of a single firm's event-driven portfolio.
- With respect to geographic concentration, the vast majority of exposures are from North America, which represents approximately 70% of all commitments, with the remaining 30% coming predominantly from Europe.<sup>13</sup> All CSE firms, with the exception of Bear Stearns, have a material amount of exposure from Europe.
- Unlike relationship lending, a significant amount of event-driven commitments are funded. However, in the typical leveraged lending context, the exposure is partially (or fully) syndicated or otherwise disposed of prior to the facility funding. Thus, the percentage of funded commitments to the total MV of event-driven lending commitments has been relatively low—in the range of 17% to 39% based on quarterly data provided by the CSE firms.<sup>14</sup>

The main drivers of funded positions are: (1) term or bridge loans to Europe where the allocation to participants in the syndication occurs after closing (and perhaps funding) of

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<sup>12</sup> See Investment Grade vs. Non-Investment Grade bar chart for more details.

<sup>13</sup> Based on the quarterly data provided by the firms, the percentage of commitments that come from North America ranged from 65% to 74% of the total outstanding commitments. See Geographic-North America vs. Europe bar chart for more details. Additionally, while there are some international commitments outside of Europe, they are immaterial. As a result, they have been lumped in with the European commitments for presentation purposes.

<sup>14</sup> See Event-driven Lending- Funded vs. Unfunded bar chart for details.

the loan; (2) hold positions in term loans over a wide range of deals; and (3) Investment Grade bridges. Generally speaking, bridge loans made as part of a financial sponsor deal are not intended to fund and in practice they are almost always taken out by the issuance of HY bonds prior to funding. In contrast, bridge loans made to corporates—whether investment grade or non-investment grade—may be made with the intention of funding temporarily until they are taken out by a HY bond offering. With that said, a firm’s exposure to a funded bridge would then depend on whether the firm syndicated out the risk prior to funding.

While the make-up of the event-driven lending portfolios of the CSE firms (separately and in total) may change month-to-month, it is clear that this business grew tremendously over the past year. The notional amount of commitments as of the end of December 2005 stood at approximately \$55 billion, more than doubling the \$20 billion in exposure at the end of 2004.<sup>15</sup> This dramatic increase resulted primarily from both the substantial increase in volume and size of individual leveraged lending deals coming from financial sponsors coupled with spikes related to chunky M&A transaction related deals (mostly investment grade).

#### **D. Primary Risks**

In contrast to relationship lending, where the investment banks intend to hold (and subsequently hedge) the mostly unfunded revolvers, there is typically no such intention with respect to event-driven loans. As such, the primary risk of a leveraged loan therefore lies in the bank’s potential inability to exit the exposure in a timely manner (at current or near current spread levels). This could be the result of a general credit spread widening event or a name specific issue in which the spreads widen considerably before the commitments are syndicated or otherwise sold down. In addition, the specific terms of a facility may not be palatable to the market and as a result, the lead bank(s) may be “stuck” with the loan for a much longer time than initially anticipated. An example of the latter occurred during this past year.

Four of the CSE firms provided Debenhams, a UK retailer, with billions of dollars in financing under the expectation that they would be able to distribute the exposure to the capital markets in several months time, primarily through HY bond issuance. This failed to materialize and the banks were forced to sit on a large, concentrated exposure to a “B” rated credit for much longer than anticipated. In addition to the potential mark-to-market losses that the firm may take as a result of its inability to exit the exposure to an event-driven loan, the firm has the risk that, once funded, the counterparty could default on the loan before it is syndicated, sold, paid down, or otherwise distributed. How the CSE firms measure and manage these risks is discussed in the next section.

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<sup>15</sup> These numbers actually understate the entire event-driven lending pipeline due to the fact that the data provided by the firms consisted of either (1) only closed loans or (2) only accepted (signed by both parties) commitment letters, depending on the firm.

However, before discussing the financial risk management and hedging practices of the CSE firms (with respect to the event-driven lending business), we would like to highlight the non-financial risks that may run high in this space. In particular, banks are exposed to the reputations of the financial sponsors and the deals being executed. In many cases, the practices of the financial sponsors leave acquired firms highly leveraged after the transaction and, therefore, susceptible to bankruptcy should business conditions deteriorate and the firm be unable to service the large volume of debt. Failure of acquired firms may lead to scrutiny of the role played in the transactions by investment banks.

In addition, as competition in this space heats up, the potential for conflicts of interest increases. As discussed above, in some cases, multiple teams from a single bank back different financial sponsor bidders. In others, banks have multiple interests at stake in a single transaction. For example, banks may play simultaneous roles as a private equity holder in one of the sponsors, as a creditor in the debt financing, or as an advisor to the consortium.

## **II. Risk Management & Hedging activities**

Risk management for the event-driven lending business can be broken into three phases: (1) Pre-commitment activities; (2) Syndication process; and (3) Post syndication risk management. While these are not perfect silos and certain activities span across the three phases, they are fairly useful in illustrating the various risk management processes employed in this area.

### **A. Pre-commitment activities (including loan approval process)**

While the specifics may vary from firm-to-firm, Pre-Commitment activities generally include loan origination, loan approval, and post approval processes.

#### **Loan Origination**

The loan origination process generally consists of three primary phases: (1) Request/Opportunity; (2) Due Diligence; and (3) Structuring and Recommendations. The loan origination process starts with a request from the borrower or an opportunity initiated by the business. If the business (e.g. deal team or client coverage team) believes there is sufficient opportunity, then the proposal will enter the due diligence phase. The business area (e.g., deal team, loan product group, etc), will perform the due diligence activities, including preliminary structuring discussions, detailed business and financial review, scenario analysis, etc.

While due diligence is primarily the responsibility of the business area originating the transactions, the level of involvement by other areas including specialized groups within the business (e.g. loan product group) and independent credit departments varies by firm. After the due diligence is completed, the proposed deal enters the Structuring and Recommendations phase, where a commitment letter (i.e. summary term sheet) complete with risk mitigants (e.g., covenants, pricing and structure flex, etc) is drafted. As of this

stage, the Credit Departments at many of these firms have rated the counterparty and drafted a loan approval memo with corresponding “hold” levels for the facility specifying the amount of various loan products the firm is willing to hold once any syndication is complete. At the end of the loan origination process, the “deal package” is created that outlines the deal recommendations and rationales (and which includes the related due diligence analysis). The deal package and commitment letter (summary term sheet) are then sent to the relevant capital commitment committee for approval.

### Loan Approval

At all the CSE firms, the extension of an event-driven or leveraged loan commitment requires the approval of a capital commitment committee. Many firms have a separate independent credit approval prior to the deal package going to committee for approval. The commitment committees are generally comprised of both business and independent control functions personnel and, in all cases, independent credit risk management is represented.<sup>16</sup> Some firms utilize a sub-committee structure, whereby certain smaller loans (generally based on size and/or rating) can be approved by the sub-committee through delegated authority. Other firms will have approval of all loans go through a single capital commitment committee, but have additional levels of senior management approval required for outsized transactions (based on size and/or rating).

The loan approval will stipulate both the credit terms (e.g. flex terms, covenants, etc.) of the facility as well as the target hold levels. The flex terms being proposed are a critical part of the discussion during the capital commitment committee process, particularly from the point of view of the syndication desks (i.e. does the syndication desk believe the terms are sufficient to allow it to distribute out the risk in foreseeable market conditions). The flex terms are structured to allow the loan commitments to “clear the market” in syndication. These flex terms will be included in the firm’s offer (commitment letter). While there are some standard terms for both (1) pricing flex and (2) structure flex (e.g. the mix of the various parts of the loan facility, including the relative proportion of 1<sup>st</sup> and 2<sup>nd</sup> lien loans) in this market, there is considerable variation in the actual terms included in any specific deal.<sup>17</sup> Generally speaking, the investment banks are usually more successful getting conservative or at least standard flex terms with small or medium

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<sup>16</sup> In the case of Bear Stearns, the only formal participation by Global Credit in this business is that Mike Alix, the former head of Global Credit (now the Chief Risk Officer), is a member of the Principal Activities Committee and as such reviews these transactions as presented to Committee for approval. The primary responsibility for managing the credit risk in Bear Stearns’ bank loan portfolio resides with the Loan Portfolio Management Group (LPM), which reports up to the Co-Heads of the Leveraged Finance Group (a joint venture between Investment Banking and Fixed Income). LPM is responsible for evaluating transactions originated by investment bankers and advising on pricing or other considerations during the due diligence process. The also are charged with assigning risk ratings to these facilities. The Credit Group within the Risk Management Department (a/k/a market risk department) performs some post-monitoring activities along with the LPM, such as credit monitoring (e.g. Credit Watchlist), mark verification, and monitoring of limits and hedging and trading decisions.

<sup>17</sup> Based on our discussions with two firms, the standard pricing flex is for 50 basis points on 1<sup>st</sup> lien paper and 100 basis points on 2<sup>nd</sup> lien paper.



size financial sponsors and corporates; whereas they usually get worse terms with the largest financial sponsors (e.g. KKR), especially in a “big splash deal” where every investment bank wants to be involved.

### Post Approval

After receiving approval from the required committees and/or senior management, a commitment letter is sent to the potential borrower. This commitment letter is also referred to as the summary term sheet. Most firms refer to this stage in the loan process as either “offered not yet accepted” or “under client consideration” and represents the earliest portion of the firm’s “event-driven” lending pipeline. While a bank’s offer (commitment letter- with one signature) includes flex and other credit terms agreed to at the relevant capital commitment committee, the final credit terms remain subject to change depending on negotiations during the post approval process (i.e. the final flex terms included in the accepted commitment letter (signed by both parties) may differ from the initial offer). Any significant changes at this stage are subject to approval by the capital commitment committee. But, during the time between when a firm submits its commitment letter to a financial sponsor and when the financial sponsor sends back a signed commitment letter, there is a lot of negotiating of the terms. As a result, by the time both parties (issuer and the lead arranger(s)) have signed the agreement (accepted not closed; or two signatures), the flex terms have been finalized. With that said, the banks prefer working with clients that allow for some wiggle room, with respect to terms, if needed (although they would have no contractual obligation to do so) and vice versa.

Several firms stated that in many instances they have the ability to modify terms (e.g. ratings-based flex), or even withdraw from the deal(s), in the event of certain credit events. However, the exercising of such rights may result in significant cost, measured in relationships and reputation. Thus, there may be real pressure to originate the leveraged loans and other financing that was originally offered, under the terms originally outlined, even if the prospects for syndication dramatically decrease.

### **B. Syndication Process**

The syndication process is the primary way that banks reduce their risk exposure in the leveraged lending business. The syndication process typically has two parts:

- (1) Lead Arranger and Agent level syndication (i.e. sub-underwriting)<sup>18</sup>—where banks bring in other banks to share in their deal (e.g., mandatory lead arrangers and agent banks), and
- (2) Primary or General syndication<sup>19</sup>—where the lead arrangers syndicate the remaining commitments further to a broader group of investors, including other banks, hedge funds, and other institutional investors.

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<sup>18</sup> There is apparently no standard term in the U.S. for the process of bringing in other lead arrangers/book runners and agent banks that occurs before the bank meeting. In Europe, this process is referred to as “Sub-underwriting”.

## Lead Arranger and Agent Level Syndication

As stated earlier, once a bank signs a commitment letter (term sheet), it generally tracks this potential commitment for risk management purposes. However, at this stage (offered but not yet accepted), no syndication activity has occurred. The syndication process will not start until the counterparty accepts and signs the commitment letter. In the case of a financial sponsor deal, the financial sponsor will generally not sign the commitment letter until it wins its bid for the acquisition, because it is at this point that compensation starts to be paid to the arrangers of the financing (i.e. the banks).

Concurrent with the issuer signing the commitment letter (accepted not closed stage), the financial sponsor generally mandates that other lead arrangers be brought into the deal. For large deals, there are usually 2 or 3 banks leading the deal.<sup>20</sup> Financial sponsors want multiple firms involved for two reasons. First, they have relationships with and commitments from multiple firms. Rather than picking one firm and giving the entire commitment to them, they mandate that other firms be brought into the deal. The form of this mandate from the financial sponsor to bring in other lead arrangers may vary, for example by specifying the particular banks or simply the number of additional institutions. Secondly, the financial sponsor wants multiple banks involved in the commitment so that it has leverage in negotiating the terms of the deal, for example by taking the most favorable terms offered by any bank and imposing these on all participating institutions<sup>21</sup>. As a result of these mandated lead arrangers being brought in, the exposure for a firm typically drops significantly once the commitment is signed by both parties (i.e. the “Accepted not closed” stage).

After the mandated lead arrangers are brought in, additional banks (i.e. agent banks) may be brought in during an interim step before the primary or general syndication. Typically, there will be a combined group of around five lead arrangers and agent banks. Agent banks can be administrative agents, syndicate agents, and/or documentation agents. Unlike the lead arrangers, the selection of these agent banks may or may not be dictated by the financial sponsor. If the financial sponsor does not dictate that certain banks be added as agent banks, then the lead arrangers can decide if they want to bring in other banks to share the risk or if they feel comfortable going straight to the primary or general syndication process. This decision may be a function of how they feel about the credit as well as how long the syndication period is going to be on the deal (i.e., the deal may require regulatory approval; thus, the time period from the signed commitment letter may be several months). In addition, the allocation to agent banks may differ proportionally than the allocation among the lead arrangers.

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<sup>19</sup> In the U.S. the broader syndication to banks and institutional investors that begins with the bank meeting is commonly referred to as either Primary or General Syndication. In Europe, it is mainly referred to as General Syndication.

<sup>20</sup> One firm stated that 95% of the deals it is involved in are with other banks.

<sup>21</sup> As stated previously, the terms included in the accepted commitment letter, may differ from the original offer the bank extended.

Before the primary or general syndication process begins, a rating agency book may be prepared. While not all deals are rated, all deals *with bridge loans* as components will need to be rated prior to the eventual bond underwriting.

### Primary or General Syndication

The general syndication process is kicked off with a “Bank Meeting.” Typically, between 20 and 60 institutional investors and banks are invited to participate in this process. Institutional investors, such as CLO managers, pension plans, etc. typically fill 70-80% of the seats. The remaining 20-30% of the investors include traditional banks, such as regional banks, investment banks, etc. Generally, commitments (i.e. allocations requested) are due within 2 weeks from the date of the “Bank Meeting.” Once the commitments are in, the lead/managing arrangers begin the process of “building the book” or determining the allocations. Generally, the final allocation and pricing of the loans occurs just prior to the signing of the formal credit agreement (i.e. the closing of the loan). At this stage of the commitment (i.e. general syndication has occurred and the loan closes), if the facility is oversubscribed, the firm as a lead arranger may be allocated zero (i.e. they were able to syndicate out all the risk prior to the loan closing). However, even if syndication goes well, the lead arrangers may be left with a portion of the revolver (and perhaps Term loan A), since these portions are syndicated just among the banks in the primary syndication whereas the Term loan B, etc. are syndicated to a wider institutional investor group.

There are a couple of exceptions to the general syndication process described above that warrant discussion. First, while it is common practice for the general syndication process to begin prior to and conclude with the closing of a loan, this is not always the case. Sometimes an issuer may want to lock up the terms of the financing earlier and the loan will close (i.e. the final credit agreement signed) prior to the start of the syndication process. Also, in certain European “funds certain” deals—the Credit agreement is signed (with very limited “outs”<sup>22</sup>) prior to the final allocation. In this case, however, the bank may have agreements with institutional investors to take a portion of the facility. These agreements are generally referred to as “circles.” The harder the circle, the more comfort the firm has that it has distributed the risk (from a risk management perspective) even though the facility has not physically allocated (i.e. final allocation has not occurred). Additionally, European deals tend to bring in more lead arrangers than U.S. deals. This may be a result of having to sign the formal credit agreement prior to the general syndication process.

The second exception to the general syndication process is with respect to bridge loans. While bridge loans may be syndicated or shared with other banks in the lead arranger and agent level syndication process described above, they are not part of the primary or general syndication process. The general syndication process that begins with the formal

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<sup>22</sup> For example, the acquisition does not go through because not enough shares of the target company are tendered.

bank meeting is for syndication of the term loans and revolvers of these facilities. The syndication or selling down of a bridge loan is more of a one-off type event. The bridge syndication process generally occurs before the bank meeting, usually around the time they are bringing agent banks into the deal. The bridges are sold primarily to institutional investors or to hedge funds. The investors for bridge loans will be those that want to issue the bonds that will take out the bridge loan, or those betting that the bridge will never fund (and they will pick up an easy 50-75 basis points). In addition, bank loan or leveraged loan trading desks do not typically trade bridge loans.

A few years ago, the standard practice across investment banks was to not syndicate bridge loans, other than the mandatory allocation to other lead arrangers/book runners, but rather to hold the remaining portion until the bridge was taken out by the HY bond offering and rely on the onerous terms of the bridge to make sure the bridge is taken out (e.g. by the issuance of HY bonds). As stated previously, in financial sponsor deals, bridge loans are not intended to fund and in practice they are almost always taken out with a HY bond offering and cancelled prior to ever funding. In a LBO financial sponsor deal, where the financial sponsor is counting on the HY bonds to provide needed funds for the acquisition, the lead arrangers will go out on a road show to sell the HY bonds and, concurrently with the closing of the term loans and revolvers (through the main syndication process), the HY bonds will be issued and the bridge cancelled at closing. As a result, the bridge should not exist at the closing of a facility for a financial sponsor deal. However, if the lead arrangers have not been successful with the HY bond offering, the bridge will still exist at closing and will be funded. In contrast to financial sponsor deals, bridge loans to corporate clients may be made with the intention that they be funded temporarily until they are taken out by a HY bond offering.

Over the past few years, the syndication of bridge loans has changed dramatically. More and more bridge loans are now being syndicated. At least one firm (Goldman Sachs) stated that they have increased the percentage of bridges they syndicate over each of the past three years and continue to see this trend in 2006. They also stated that this was an industry trend—not solely firm specific. The syndication of bridge loans will have the effect of reducing risk but will also reduce the fees that investment banks receive.

Bridge loans typically have 3 types of fees: (1) commitment fee- 75 basis points; (2) funding fee (since very rarely funded, the investment banks typically don't see this fee) and (3) take-out fee- 2 ½ to 3 points. When the lead arranger syndicates out the bridge, he is typically paying a large portion of the commitment fee (on a pro-rata basis) to the taker of the risk—typically between 50 and 75 basis points. The lead arranger may also be giving up league table standings when syndicating the bridge. Thus, from a risk/return analysis, the lead arranger can retain all the risk (i.e. not syndicate) and typically earn 3 ¾ points on a bridge or syndicate out the risk and make between 3 and 3 ¼ points. Apparently, the firms are moving more towards the latter.

While the trend is moving towards more syndication of bridges, generally, the amount of a given bridge that the lead arranger can syndicate out is limited. In contrast to terms loans and revolvers (where most, but not all, financial sponsors do not care if the lead

arrangers hold any of the paper), the financial sponsors generally like the lead arrangers to own 50% of the bridge. Since the bridges require further action and many things can change, the financial sponsors would rather deal with lead arrangers than with investors.

As a result of the low interest rate and benign credit environment of the past few years, the investment banks have generally been very successful in syndicating out the event-driven lending commitments.<sup>23</sup> While the aggressiveness of terms and leverage used tended to ebb and flow throughout the year, credit risk managers consistently noted investors' willingness to buy this paper as they continued to "search for yield." With that said, while rare, there have been times when syndications have not gone according to plan and the firms have been stuck with exposure well above their hold limits (as was the case in the Debenhams example discussed previously).

### **C. Post-syndication process**

After the syndication process is completed, the firm has two main ways to reduce exposure that is greater than their intended hold amount: (1) sell the loans in the secondary market or (2) hedge the exposure. Generally speaking, after the final allocation has occurred in the syndication process, CSE firms go immediately to the secondary market to sell off their remaining unwanted exposure. The CSE firms all stated that non-investment grade bank debt (i.e. leveraged loans) is much easier to sell in the secondary market than investment grade relationship loans. For example, one firm provided data showing that over 90% of its leveraged loan portfolio had observable external quotes (as reported by LSTA<sup>24</sup>). Also, the buyers in the secondary market are typically many of the same buyers as in the syndication process, such as smaller banks, etc., who did not get allocated as much of the loan as they had requested. Other secondary market investors include those who deliberately wait on the sidelines in hopes of picking up some of the loans at better prices (e.g. trading desks at banks).

While the primary reduction in risk comes from the syndication process, followed by the selling of loans in the secondary market, firms can also reduce risk through hedging. The two main instruments used to hedge exposure to leveraged loans are: (1) Credit Default Swaps ("CDS") referencing bonds (or a HY bond index) and (2) CDS referencing leveraged loans. While CDS referencing bonds has been around for quite some time, CDS referencing leveraged loans is fairly new (coming to the marketplace during 2005). To date, there has been very limited use of CDS referencing leveraged loans for hedging purposes at the CSE firms. Rather, the product has been used primarily by institutional investors who want to gain exposure synthetically to leveraged loans.

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<sup>23</sup> For example, the Head of Credit Risk at Merrill Lynch stated that they have had less than 10 troubled syndications over the past 4 years.

<sup>24</sup> LSTA-Loan Pricing Corp- is a main source of prices in the syndicated loan market and is quoted daily in WSJ.

Unlike in the relationship lending area where single name CDS are used quite often to reach a target hold level, most CSE firms do not generally hedge their leveraged lending exposures. Most firms cited (1) lack of availability and (2) cost as reasons for the limited usefulness of this product for hedging these transitory loan positions. Some firms also added the issue of whether or not they could get access to the referenced bonds to deliver into the contract as a limiting factor as well. With respect to the lack of availability of CDS on bonds referencing leveraged lending names, the same firm that had observable external quotes for 90% of its leveraged lending positions had only 22% observable marks for CDS referencing Bonds for the same portfolio of names.

There are, however, a couple of exceptions to this general position. The biggest outlier is Lehman Brothers. In contrast to the other CSE firms, Lehman Brothers hedges a significant portion of their leveraged lending portfolio. While much of the hedging activity relates to exposure from relationship loans made to non-investment grade counterparties, a significant portion of the leveraged loan exposure coming from the event-driven business is also hedged. Similar to the other firms, post-closing of the transaction, Lehman's loan trading desk (private-side) generally makes markets in the loans and seeks to reduce its remaining exposure in accordance with agreements with the issuer, and subject to market conditions. However, certain financial sponsor or corporate borrowers in event-driven lending may request that their lead arrangers hold a minimum portion of the revolver and perhaps other parts of the facility as well. In this case, Lehman actively looks to hedge these remaining exposures by using both (1) single name CDS referencing leveraged loans and (2) single name CDS referencing HY bonds to hedge these exposures. Also, where appropriate, Lehman sells "risk participations" in its exposures to certain loans. These participations can take the form of participation for the life of the loan or for shorter terms.

The other exception is with respect to Goldman Sachs' hedging activities. Unlike Lehman Brothers, Goldman does not hedge the idiosyncratic risk (i.e. they do not purchase single-name CDS) of its leveraged lending portfolio primarily because there are no sellers of protection (at a reasonable price in their opinion) for the leveraged loans they syndicate. However, Goldman Sachs does hedge some of the systematic "syndication and bridge risk" related to its leveraged loan portfolio. Goldman Sachs uses the HY CDS Index to obtain general market spread protection against a large shock in high yield credit spreads.

#### **D. Ongoing risk measurement and monitoring**

As discussed previously, the strategy for managing risk from event-driven loans is to distribute these loans as quickly as possible. Therefore, much of the on-going portfolio management of the corporate loan portfolio relates to the relationship loans that are not transitory in nature and generally require a lot of hedging activity to get exposures down to their approved "hold" levels. However, the ongoing monitoring of commitment levels against their limits and the continued monitoring of the creditworthiness of names in the portfolio as well as adherence to loan covenants is performed for event-driven commitments.

The primary on-going activity with respect to event-driven loans is to measure and monitor, through various metrics, the exposure(s) generated by the event-driven portfolio and to report these metrics to senior management. For the event-driven lending commitments, firms begin measuring and monitoring their exposures in the early stages of a commitment (e.g. offered not yet accepted commitments). Most firms refer to this stage in the loan process as either “offered not yet accepted” or “under client consideration,” which represents the earliest stage of the firm’s “event-driven lending pipeline.” At this point, most firms start to monitor their exposure in one way or another. However, there is no standard for measuring or managing exposure for this early stage of the lending pipeline. Some firms try to probability-weight these “offered not yet accepted” commitments to be able to measure the potential exposure of their pipeline, while others simply keep track of the offered commitments in gross. During this past year, one firm (Morgan Stanley) imposed a new limit on its probability-weighted event-driven lending pipeline. In the case of financial sponsor deals, many of these offered commitments will never close or if they close, the firm’s exposure is likely to be much less than the full commitment because the standard practice is for the investment bank to be “married to other banks” (i.e. bringing in other mandated lead arrangers) for the commitment.

For accepted commitments,<sup>25</sup> many firms track and limit corporate lending commitments (including event-driven loans) both based on a single-name and portfolio basis for investment grade, non-investment grade, and Total exposures. In addition, many firms have separate sub-limits on the commitments, such as: (1) In syndication; (2) Long-term Hold; Portfolio; Residual New Issue and (3) Bridge loans. As stated previously, during 2005, Morgan Stanley also created a sub-limit for financial sponsor deals, to highlight and limit these typically more leveraged deals. The categories for sub-limits vary by firm.

For the various categories above, firms may monitor and limit exposures based on a variety of risk metrics. Some firms monitor and limit based on the dollar amount of commitments (whether funded or unfunded), which is generally performed by the independent Credit Department. Others use more of a market risk metric, such as scenario analysis (e.g., credit spread widening scenario<sup>26</sup>) or VaR as the metric to monitor and limit exposures in the corporate lending portfolio with these activities generally being performed by the independent Market Risk Department. Finally, firms also use a

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<sup>25</sup> This may be a follow-up point to confirm at what point commitments are included in the various risk metrics used internally by the firm for risk management. See Capital Calculation section for details of when commitments are included in the capital calculation.

<sup>26</sup> Both Goldman Sachs and Morgan Stanley rely heavily on scenario analysis in monitoring risk of the corporate lending portfolio as a major risk for this business is a shock to credit spreads. Whereas the credit spread widening scenario is Goldman’s primary risk metric used in monitoring and limiting the business, Morgan Stanley relies on both the \$ commitment limits monitoring by the independent Credit Department and the Scenario analysis results monitored by the independent Market Risk Department.

combination of risk metrics (measuring and monitored by both the credit and market risk departments) for their corporate lending portfolios.

As of the beginning of 2005, all the CSE firms ran a VaR calculation on their entire corporate lending positions, including the event-driven positions, regardless of the capital treatment. However, over the past year, with the growth of these portfolios (and consequently the growth in VaR related to these businesses), there has been a change in how some of these firms use and disclose (both internally and externally) VaR for the corporate lending portfolios.

Merrill Lynch: At the start of 2005, ML included its Corporate and Institutional (“C&I”) Lending business in its Trading VaR, used for both internal risk management and external reporting purposes. However, during the early part of 2005, C&I VaR began to spike with the increase in large leveraged loan transactions. The resulting impact of including this business in Trading VaR was that it tended to “crowd out” traditional flow and proprietary credit trading activity, leading to problems in risk governance and limit setting. Additionally, the business was not being risk managed through VaR, but rather primarily risk managed in the credit world, through the upfront loan approval process.

As a result, during the summer of 2005, Merrill Lynch moved the C&I lending portfolio out of Trading VaR and into Non-Trading VaR for both internal risk management and external reporting purposes. Finally, as of the filing of its 2005 10-K, Merrill is discontinuing its Non-Trading VaR disclosure and instead will enhance its credit disclosures for areas previously included in Non-Trading VaR, such as commercial loans. For internal risk management purposes, corporate risk management will continue to internally report Non-Trading VaR results.

Morgan Stanley: During 2005, Morgan Stanley began distinguishing between Economic VaR (i.e. VaR used for internal risk management purposes within Morgan Stanley for positions for which they view as “trading risk” and for which they view it reasonable to include in a VaR calculation) and Basel VaR (i.e. those positions that meet the Basel definition of trading book). Economic VaR is used for internal risk management purposes (e.g., VaR limit and usage purposes); whereas Basel VaR is used for external reporting purposes. Leveraged loans (“event-driven” loans) and non-investment grade relationship loans (generally) are positions that are included within Economic VaR but not generally in the Trading book, as capital charges are calculated based on a banking book approach.

While the Market Risk Department does calculate a VaR on leveraged loans (and the corporate lending portfolio in general), due to the nature of the business and the growth in size of the portfolio, MRD now separates the lending exposures out from the rest of their credit business. In addition, within the scenario analysis report, the Lending Joint Venture is still reported as a segment within Credit



Trading Total, but broken out separately from the Corporate Credit Group (“CCG”).

While VaR is still calculated by most firms on these positions, because the deals are event-driven and very difficult to hedge, VaR is not perceived as the best metric by which to assess the risk of leveraged lending exposure. As a result, senior management takes more of a jump-to-default perspective on these exposures; thus, firms rely heavily on their due diligence, commitment committee, and syndication processes, in other words traditional credit risk management tools, to manage risk in this business.

### **III. Capital calculation**

This section of the report discusses the major determinations made by the CSE firms with respect to capital charges taken on event-driven lending positions. Our intent is to highlight areas where there are consistencies across the firms as well as highlight firms that are outliers.

Currently, the two most significant decisions impacting the calculation of the risk weighted assets (and thus capital charges) for this business are (1) the determination of when in the life cycle of a deal are commitments included in the capital calculation and (2) whether the positions receive trading or banking book capital treatment. In addition, once these major decisions are made, the approach taken by firms in calculating the various inputs into the capital calculation, whether trading or banking book, will also affect their respective calculations. For example, the choice of a credit conversion factor, to translate unfunded notional commitments into credit equivalents for either banking book capital charges or for specific risk add-on charges, can have a material impact on the capital held against a position. Again, we will attempt to highlight both consistencies in practice as well as outliers.

When analyzing the capital calculations of the CSE firms, for the event-driven lending business (as well as other areas), it is essential to look at the calculation in its entirety. The Basel Standard requires many decisions to be made for which a clear answer is not always obvious. As such, focusing solely on one decision made (e.g., trading book vs. banking book capital treatment) may lead to an inaccurate understanding of the relative conservatism of the capital held against the positions. For example, a firm may be very conservative (in absolute or relative terms) about the commitments that it holds capital against, but be more aggressive in the choices made in calculating the various inputs to the capital charge on those commitments, such as credit conversion factors. Equally important, when trying to make judgments concerning peer-to-peer comparisons, the “devil is in the details”. For example, one portfolio may have a higher concentration of non-investment grade names and higher concentration of funded commitments, while the other may have significant investment grade exposures and less funded positions. The percentage of capital held by these two firms against their respective portfolios will obviously differ.

*(A more technical Excel attachment, with a side-by-side comparison of the firm's capital (by component and in total) for the event-driven business is available.)*

#### **A. Commitments included in capital charge**

Perhaps the biggest impact on the capital held by a CSE firm for the event-driven lending business is the determination of when to include a commitment in the calculation. As discussed earlier, there are many different stages a commitment goes through in the event lending process including: (1) Request/Opportunity identified; (2) Approval by Capital Commitment Committee (pre-issuance by the firm of a commitment letter); (3) Commitment letter (summary term sheet) signed and sent to borrower (i.e. one signature; (offered not yet accepted)); (4) Commitment letter signed by both CSE firm and the issuer (i.e. two signatures); (5) Loan Closes (i.e. final credit agreement signed). Also, as discussed previously, during and between these stages, a firm's exposure to a commitment can change dramatically due to other banks being brought into the commitment as well as the general syndication process.

The determination of when to include a commitment in the capital calculation appears to be a less than settled issue at some of the CSE firms. To this end, we will lay out what the firms' approaches were during the following: (1) the time period of this project (through 4<sup>th</sup> qtr 2005); (2) current approach (1<sup>st</sup> quarter 2006); and (3) potential future intentions (shared with OPSRA staff).

#### **As of the data provided for this project:**

As of the 4<sup>th</sup> quarter 2005, the CSE firms fell into one of two groups with respect to the stage at which they included a commitment for regulatory capital purposes. First, the more conservative group included all commitments starting when both the CSE firm and the issuer had signed the commitment letter (term sheet). This stage has been referred to as the two signature stage or the accepted not closed ("ANC") stage. Thus, for this group, whether or not a loan has closed (i.e. the final credit agreement signed) is irrelevant. This first group consists of both Goldman Sachs and Morgan Stanley.

The second group of firms includes only those commitments that have closed. In the U.S., particularly with respect to financial sponsor deals, the vast majority of exposure has already been syndicated out prior to the closing of a loan facility. In Europe, the difference would not be as pronounced since many European deals are closed prior to syndication. As a result, all things equal, these firms would hold less capital than their counterparts in the first group. This second group includes the remaining CSE firms, Bear Stearns, Lehman Brothers<sup>27</sup>, and Merrill Lynch.

#### **As of end of 1<sup>st</sup> quarter 2006:**

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<sup>27</sup> While Lehman Brothers calculates capital only on closed commitments, the notional commitment data provided for this project (and included in the graphs) includes accepted not closed commitments as well.

The only change that took place, from the time that data was provided to us for this project and the current state of affairs, is with respect to GS. As of February 24<sup>th</sup> (end of GS' 2006 1<sup>st</sup> quarter), GS changed how it recognizes loan commitments for accounting/risk management/and regulatory purposes. Now, GS includes all offered commitments (i.e. signed commitments by GS (offered not yet accepted)) in its data for external reporting purposes (included in the commitment footnote), certain risk measures<sup>28</sup> (e.g. top 10 single name exposures), and for calculating capital charges. However, there are two adjustments that are made to the total gross offered commitments to get to the net exposures to use for external/risk/and regulatory capital purposes. First, to make sure they are not double counting commitments, GS includes only one commitment per acquisition. For example, if they are backing multiple sponsors for the same acquisition target, they will only include one commitment, since both commitments can't happen. Secondly, they have a time out provision. The time out provision- states that they will exclude an offered commitment from the total if it has been outstanding (i.e. offered but not yet accepted) for a particular period of time (generally between 30-90 days) and not acted upon by the potential borrower.

This decision to switch appears to have been made for a couple of reasons based on our conversation with Goldman Sachs' regulatory controllers. First, they understood some investment banks were recording the loans for external reporting and capital purposes as of the 1<sup>st</sup> signature. (Interestingly, none of the other CSE firms fall within this group). Secondly, while Goldman Sachs' legal department didn't think this was the right answer, the accounting rules are different from legal requirements (i.e. an irrevocable offer should be in the commitments footnote). As a result, they thought the conservative thing to do was to include the loan commitments at the time GS signs the commitment letter (term sheet).

The impact of this change will be two-fold. First, the numbers from month-to-month will be much more volatile. Secondly, the overall number for commitments will be much higher (in effect weighting newly (30-90 days old) offered commitments at 100%).

### Potential future intentions

In our follow-up discussions with Morgan Stanley on the event-lending business, credit risk personnel (including the Co-Head of Institutional Credit, Chip O'Brien) expressed their concerns about their current approach for regulatory capital purposes. In contrast to

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<sup>28</sup> For the credit spread widening scenario, they currently do not include those commitments offered but not yet accepted (i.e. only having GS's signature) as positions. Alex stated that this was due to the large (approximately 50%) drop off of loan commitments that actually close (from those where GS is the only one to have signed the commitment). Most of the decay is related to the deal never happens (i.e. they backed the wrong financial sponsor or the financial sponsor picked another bank to lead the commitment). In contrast, the amount of loan commitments that have actually closed tracks very well with the amount of loans with 2 signatures. Therefore, they are not sure it would be comparing apples-to-apples with positions in other product areas included in the credit widening scenario. With that said, there hasn't been a decision made yet on whether to include the more expansive set of commitments into the credit widening scenario. There is an upcoming meeting scheduled with the CFO concerning this issue.

Goldman, which is moving to a more conservative approach for determining when commitments are included in the capital calculation, Morgan Stanley expressed its desire to move to a more aggressive (but in their eyes are more rational) approach for capital purposes (they were silent on any moves for external reporting and risk management purposes).

As stated above, MS currently includes all Accepted not Closed (“ANC” or 2 signatures) commitments for capital purposes. However, they discussed their reservations about including ANC commitments where they (Morgan Stanley) have sufficient conditionality to get out of the deal. Basically, they expressed a desire to bifurcate the ANC category into two buckets: (1) ANC with virtually no conditionality and (2) ANC with conditionality and then only include the first bucket in its capital calculation. Their issue boils down to “if you can assure senior management that you can walk away from the deal...then should we be holding capital for the commitment?” They also stated that other large banks (not the CSE firms) focus on this conditionality issue.

With that said, this proposal appears to be in its infancy stage and the firm will come back to us for approval prior to moving forward with this change.

## **B. Banking book vs. trading book decision**

The second biggest factor driving the capital held against the event-driven lending business is the firm’s decision of whether to treat the positions as trading or banking book positions. Generally speaking, the risk weighted assets (and thus capital charges) are much greater when putting a position in the banking book vs. the trading book (without Regulation-Y add-ons). However, this discrepancy is mitigated substantially by the specific risk add-on charges taken. In particular, all the firms that have trading book positions are currently taking a specific risk charge of 8% against all their non-investment grade event-driven lending positions. In calculating this charge, unfunded commitments are generally translated into a funded equivalent by using a Credit Conversion Factor (“CCF”) to which the 8% charge is applied. In the case of investment grade exposures, the practice varies- (see section C. Material inputs to the trading and banking book capital calculations for details).

In determining the trading vs. banking book status, the CSE firms appear to take one of two approaches: (1) treat the entire portfolio as either trading or banking or (2) make the determination position by position. The first approach is employed by Merrill Lynch, Goldman Sachs, and Bear Stearns. The only firm that includes all its event-driven lending in the banking book is Merrill Lynch. In contrast, Goldman Sachs and Bear Stearns include all their event-driven lending positions as trading book positions.

For Morgan Stanley and Lehman Brothers, the determination of trading or banking book status is made on a position by position basis. The decision of where a position goes for these firms will usually depend on the combination of the following factors: (1) liquidity and ability to hedge; (2) daily marking-to-market; and (3) active risk management. Much

of the detail seems to be centered on whether or not the position can be hedged with sufficient liquidity as all the positions are marked daily and actively risk managed.

While Morgan and Lehman have similar approaches—making the determination position-by-position—they end up in two very different places. First, the vast majority of Morgan Stanley’s event driven positions are classified as banking book positions. It appears that the only leveraged lending positions that do not go into the banking book are the ones for which Morgan is actively hedging the name, which is a very small portion of its event-driven positions (e.g. Debenhams exposure). In contrast, a very small portion of Lehman Brother’s event-driven positions are included in the banking book (typically between 10-15%). While they do more hedging of non-investment grade loans than their CSE counterparts, it appears that Lehman designates a position as trading book if there is the “ability to hedge with sufficient liquidity” rather than the firm having to show evidence of hedging an exposure.<sup>29</sup> This might also explain the divergence between the relative trading vs. banking book classifications of Morgan and Lehman’s portfolios.<sup>30</sup>

### **C. Material inputs to the trading and banking book capital calculations**

#### **Trading book**

The capital charge for trading book positions in this business is fairly uniform across the firms; in that the capital charge will consist of a (1) VaR based component plus a (2) specific risk component. The specific risk component (particularly the Reg-Y add-on charge) generates most of the capital held against the trading book positions.

#### **VaR component**

The VaR based component for all the firms with trading book positions is based on the 10-Day VaR at the 99% confidence level and a multiplier.

All the CSE firms that have trading positions use their general historical simulation VaR method for this product space (and most others). The length of the time series of data may differ from firm to firm, but the norm is 4 years of data. There are three noteworthy items in the calculation of VaR for the leveraged loan space: (1) how unfunded loans are treated;(2) how the time series of spread moves that will generated the hypothetical P&Ls for the VaR calculation are generated; and (3) how is the specific risk calculated. With respect to the funding issue, all the firms that use VaR predominately for the event-driven space (especially leveraged loans) treat all unfunded commitments as fully funded for the VaR calculation. However, with that said, at least one firm (Bear Stearns) adjusts the

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<sup>29</sup> The following excerpt was taken from Lehman’s capital presentation to the SEC, “Positions that are liquid, hedge-able and marked-to-market are designated as TB, whereas positions that are deemed not hedge-able are designated as BB.

<sup>30</sup> We should confirm our understanding of this approach with both firms.

spread downward for the unfunded positions. In contrast, Morgan Stanley uses a loan option model to predict the funding of an unfunded commitment for its VaR calculation; however, further analysis of this model was not performed as the vast majority of leveraged lending positions reside in the banking book.<sup>31</sup> With regards to the volatility of credit spreads for these bank debt positions, the firms<sup>32</sup> generally proxy HY indices for their bank debt positions and then will make a downward adjustment to the volatility of the HY indices given the lower volatility seen in the bank debt market. While these adjustments vary by firm, the rationale is to adjust for the more senior nature of bank debt in the capital structure. Finally, specific risk or idiosyncratic risk is generally captured by regressing the error term (or residual risk) against the comparable index return. As will be discussed below, all the non-investment grade positions will attract a Reg-Y add on; however, the firms have not (“turned-off”) their specific risk charges included within the 10-day VaR numbers they have provided.<sup>33</sup>

### Specific Risk component

The specific risk component consists of (1) model-based and (2) non-model based charges (i.e. Reg Y add-on charge). The specific risk modeled category currently applies only to investment grade positions (as the Commission has not yet granted specific risk approval for non-investment grade positions). Basically, the charge for specific risk modeled is an additional one times the 10-Day VaR measure in addition to the base requirement of three times the 10-Day VaR. It appears that Goldman is a little more conservative in this approach since they have a multiple of four times 10-Day VaR plus they add the additional one times the 10-Day VaR.

The specific risk charge for exposures not modeled is basically a Regulation-Y add-on. Thus, Bear Stearns, Goldman Sachs, and Lehman Brothers each apply an 8% charge to all non-investment grade exposures.

While most firms have model approval for the specific risk of investment grade positions, some firms nonetheless still take add-ons. Bear Stearns applies an 8% add-on charge for large investment grade lending positions (i.e. MV > \$200 million)<sup>34</sup> and Goldman Sachs applies a specific risk add-on charge to certain investment grade positions based upon the credit equivalent amount (i.e. unfunded commitments are multiplied by a CCF).<sup>35</sup>

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<sup>31</sup> If this were to change, we would probably want to revisit the Loan option model used by Morgan Stanley for its corporate lending portfolio.

<sup>32</sup> This issue was discussed specifically with Bear Stearns and Lehman Brothers.

<sup>33</sup> As an aside, it should be noted that currently, Merrill Lynch’s VaR makes no attempt to capture idiosyncratic risk; whereas the other firm’s VaR models do with varying degrees of granularity.

<sup>34</sup> No such positions existed in Bear Stearns’ event-driven portfolio at 12/31/2005.

<sup>35</sup> At 11/25/2005, Goldman Sachs’ event-driven portfolio had a significant amount of investment grade positions (around 51% of the portfolio), most of which were unfunded. This portfolio mix coupled with its use of a CCF (other than 100%), to determine the credit equivalent amount for unfunded commitments,

However, the calculation of the exposure to which the charge applies can differ based on two issues: (1) how unfunded commitments are treated and (2) how CDS hedges are incorporated. With respect to the funding status of a loan, both Bear Stearns and Lehman Brothers treat all loans as fully funded and thus take the charge on 100% of the exposure. Goldman Sachs, on the other hand, applies a credit conversion factor (CCF) to convert an unfunded commitment to a funded equivalent to which it applies the charge. For non-investment grade exposures with a tenor less than 1 year- the CCF is 20% and for non-investment grade exposures with a tenor greater than 1 year- the CCF is 50%. (*This could obviously have a large impact on the capital held since most of the commitments are unfunded for GS, especially since they include commitments at earlier stages than others- This somewhat mitigates their previous conservatism as compared to BS and LB*). The other factor is how the firms treat CDS positions used to hedge the commitments. In determining the exposures for calculation of specific risk charges, Bear Stearns looks at the exposures (by issuer) net of the credit hedges. As of the time of its data submission for this project, Lehman treated the CDS and loan commitment separately and applied the specific risk charge to both sides (a fairly onerous position to take). Subsequently, Lehman has requested to take a specific risk charge on the larger of the two, both not both. OPSRA has acquiesced to this request. This is still more conservative than netting the two positions as BS does. However, BS does not hedge much of its event-driven portfolio, so this distinction might not be material.

### **Banking book**

Similar to trading book positions, the capital charge for banking book positions in this business is fairly uniform across the firms (excluding Merrill Lynch-discussed below). The firms, calculating capital under Basel II, calculate risk weighted assets using the same formula. For non-defaulted loans, the major components that go into calculating the risk weighted assets are: (1) Exposure at Default (“EAD”); (2) Probability of Default (“PD”); and (3) Loss Given Default (“LGD”).

The EAD is a function of the funded amount, unfunded amount, and the credit conversion factor used ( $EAD = \text{Funded amount} + CCF * \text{Unfunded amount}$ ). The CCFs used by all three firms with banking book positions are different. Lehman Brothers uses a 50% CCF for all unfunded amounts. ML converts unfunded exposures to credit equivalents using CSE provided factors (20%  $\leq$  1 year and 50%  $>$  1 year). Finally, Morgan Stanley’s CCF is a function of the loan type and obligor rating. For all term loans and letters of credit it uses a 100% CCF (MS treats all bridges as Term loans for CCF purposes). For all other loans, the CCF will be a function of the obligor rating: A- or above = 75%; BBB+ through BBB- = 70%; BB+ through BB- = 60%; B+ through B- = 50%; and C 40%.<sup>36</sup>

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resulted in an aggregate percentage specific risk add-on charge well below 8% of the notional commitments.

<sup>36</sup> The rationale for a decreasing CCF for lower rated names is that these loans will have better covenants.

Regarding the calculation of PD for the credit risk charge, the current approach is for a firm to map its internal ratings to an external rating agency, such as S&P or Moody's, and use the rating agency's PDs, subject to a floor. At least one firm, Morgan Stanley, has suggested that they believe that the current approach really overstates the capital that should be held, based on analysis comparing this approach to their actual performance (based on the limited data) as well as the FSA discussion paper on this topic. They had planned on perhaps proposing a change to us but have put that discussion on hold as they focus on other internal priorities.

The LGD calculation varies across firms. Morgan Stanley's has a standard LGD for investment grade unsecured loans=60% and the LGD for secured loans would be between 30%-60% based on collateral type and debt cushion; junior subordinated unsecured loans (e.g., most of the subordinated bridges) =75%-subject to an expert judgment override of 100%. In contrast, Lehman Brothers uses a straight 35% (based on historical external rating agency information).

Merrill Lynch's capital calculation is different than either Morgan Stanley or Lehman Brothers, as they are currently applying Basel I. Merrill Lynch only needs to know the gross exposure and the amount of unfunded commitments included in its gross exposure to calculate its risk weighted assets. This is because it risk weights all loans at 100%. Thus, the only calculation that must be done is to convert unfunded commitments to funded commitments, using the CCF. As stated above, it uses the CSE provided CCFs of 20% for loans  $\leq$  1 year and 50% for loans  $>$  1 year in tenor.<sup>37</sup> PD and LGDs do not come into this Basel I calculation. Finally, they do not recognize collateral or other risk mitigants for capital calculation purposes in this business.

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<sup>37</sup> Follow up question-how do they treat an unfunded bridge with a 1 year term but that converts into a 9year term loan if not taken out



## MEMORANDUM

May 15, 2007

TO: Erik R. Sirri, Director  
Robert L. D. Colby, Deputy Director  
Michael A. Macchiaroli, Associate Director

THROUGH: Matthew J. Eichner, Assistant Director

FROM: James T. Giles, Accountant  
Kevin D. Silva, Financial Risk Analyst

RE: Spring 2007 Update on Event-Driven Lending: Current Market Practice, Risk Management & Capital Treatment

This memorandum provides an update to the Event-Driven Lending paper we completed and distributed last April. Several noteworthy trends in market practice have developed over the last year as leveraged lending has continued to expand rapidly. In addition, while the risk management practices and capital treatment are largely the same as discussed in the paper, we highlight some minor changes in practice at the CSE firms in these areas.

While the exposures in this area are significant and growing, this business continues to attract significant attention by both independent risk management and senior management at the CSE firms. Overall risk governance and daily risk management with respect to this business appears to be functioning adequately.

### **Market Practice**

As discussed in the original paper, event-driven lending consists primarily of “leveraged” bank loans made to non-investment grade counterparties, typically used for acquisitions, leveraged buyouts (“LBOs”), or recapitalizations. Heavy users of leveraged loans tend to include “financial sponsors” like KKR and Blackstone. Although fewer in number than leveraged loans, the event-driven portfolios at some CSE firms also periodically include a small number of very large transaction-related loans made to investment grade counterparties.

The event-driven lending portfolios at the CSE firms, which more than doubled from 2004 to 2005, continued to grow in 2006 (as was the case with the industry as a whole). Total 2006 U.S. new issue leveraged loan volume for the industry climbed to \$480 billion, up 63% from the previous record in 2005. New issue volumes were driven by M&A and LBO activity (2006 LBO loan volume grew to \$122 billion from \$65 billion in 2005), including record financial sponsor activity.<sup>1</sup> These robust volumes have continued into 2007. In addition to the growth in the overall market, the size of many of the individual deals has grown substantially. Most of the largest LBOs have occurred in 2006 and into 2007 (e.g., Hospital Corporation of America (“HCA”); Equity Office Properties; TXU<sup>2</sup>). While there have been some “outsized” individual commitments recently, the event-driven lending portfolios at all the CSE firms are fairly diversified with a mix of different issuers and industries represented. Another trend in CSE portfolios is that many of the larger recent deals have been in industries that require regulatory approval (e.g., media/cable,

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<sup>1</sup> From Morgan Stanley’s “2006 Leveraged Loan Market Review”

<sup>2</sup> The \$45 billion LBO of TXU has not closed yet.

utilities, etc.), which has caused the velocity of the commitments through the pipeline to slow down.

In many of the largest LBOs over the past year, CSEs have not only been advisors and lead arrangers of the debt financing, but have also co-invested with the sponsors of the deal. For example, in all of the three significant LBOs stated above, CSEs provided bridge-equity commitments and/or direct equity investments either through their asset management platforms or the principal investing arms of the firms. While the direct equity investment is not intended to be temporary in nature, the bridge-equity commitments are intended to be short-dated commitments used by the financial sponsors as they line up other equity investors. This practice appears to have spread to leveraged lending from the commercial real estate space.

The leveraged loan market has come to be heavily driven by Collateralized Loan Obligation ("CLO") issuance. Increasingly, the leveraged loan market is heavily dependent on the CLO bid as these structured vehicles purchase the majority of originated loans sold to the institutional market. CLO purchases accounted for more than 60% of the primary market for institutional loans in 2006.<sup>3</sup> In recent months, risk managers highlighted that the proportion of the leveraged loans purchased by CLOs has increased further (north of 70%).

In addition to the developments noted above, the underlying risk characteristics of the leveraged loans themselves are increasingly changing to reflect more aggressive terms. Since the time of our cross-firm project, the leverage levels have increased, the loan covenants have been scaled back, and the use of alternative amortization schedules has increased.<sup>4</sup> These trends have continued and are accelerating into 2007.

#### Leverage levels

The average LBO leverage multiplier for larger deals for the fourth quarter 2006 was 5.7X, up from 5.4X in 2005 and 4.9X in 2004.<sup>5</sup> Based on our most recent monthly risk meetings with the CSEs, recent leverage levels have been as high as 7X (or more) for many deals.

#### Covenant-Lite

Leveraged bank loans, in contrast to high-yield ("HY") bonds, are generally secured and include a series of covenants that put restrictions on the borrower. Traditional covenants include: (1) financial covenants; (2) limitations on debt; (3) limitations on restricted payments; and (4) limitations on capital expenditures. "Covenant-Lite" refers to loans that do not have the same standard covenants traditionally seen in the leveraged bank loan market. One of the primary differences is with respect to the financial covenants. For a traditional bank loan, the company would be subject to "on-going" compliance with certain financial ratios (e.g., debt/EBITDA or EBITDA/interest) and would be in technical default if they did not maintain the required ratio. Under covenant-lite structures, compliance with these financial ratios is "incurrence" based (i.e. tested upfront, not an ongoing maintenance test).

Over the past two years, there has been an explosion in the issuance of "covenant-lite" loans. Over \$20 billion was issued in 2006 up from just \$2 billion in 2005 and \$100 million in 2004. While this feature is not exclusively requested by financial sponsors, they are the predominant

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<sup>3</sup> From Morgan Stanley's "2006 Leveraged Loan Market Review"

<sup>4</sup> Some firms have noted an increase in the use of PIK (payment-in-kind) loan features in commitments. Rather than having an amortizing balance, interest payments to investors accrue during the life of the PIK loan and are only paid when the debt is redeemed.

<sup>5</sup> From Morgan Stanley's "2006 Leveraged Loan Market Review"

users. According to one firm, the amount of covenant-lite loans issued in the 1<sup>st</sup> quarter 2007 was approximately \$48 billion, dwarfing all of 2006's issuance.

In addition, risk managers have recently noted that the ability to get "covenant-flex" (i.e. the ability to put covenants into the credit agreement if the deal does not syndicate effectively without the covenants) has decreased.

While these covenant-lite features may provide borrowers with significant flexibility to deal with broad economic downturns or firm specific issues, the resulting postponement of covenant breaches substantially reduces the ability of creditors to take early action should credit quality deteriorate. As a result, risk managers have expressed concern that if a default occurs, the recovery rates associated with these loans may be far lower than typically seen in the bank loan market. The impact on recovery rates on second lien loans<sup>6</sup> would be even more severe.

### **Risk Management**

As discussed in our April 2006 report, the risks of event-driven lending are managed first through the upfront loan approval process, and then later through the syndication of exposures. The firms rely heavily on this upfront loan approval process in mitigating the idiosyncratic risk of these commitments. The syndication process is the primary mechanism through which the firms reduce their risk exposure to leveraged loans. There have been no significant changes to either of these processes since we conducted the cross-firm project.

However, the combination of the size of these portfolios, the underlying changing characteristics of the loans themselves, the slow down in the velocity of some of these commitments through the pipeline, and the overall tight levels of spreads has caused increased attention at the senior management level. In some cases, risk management has taken a fresh look at their risk metrics in this area, particularly credit spread widening scenarios. For example, one firm that relies heavily on its credit spread widening scenario for monitoring and limiting the exposure from its event-driven lending business began performing an additional, complementary scenario. In its formal (limit-setting) scenario, the shock to credit spreads is based on the *percentage increase* in spreads during the "Fall of 1998" (Russia default/ "LTCM" collapse). Based on the historically tight spreads in today's market, the firm decided to augment this with a scenario where spreads on the loans blow out to the *absolute levels* seen during the "Fall of 1998."

In addition, many of the CSE firms have increased their hedging activity. At the time of the cross-firm project, the amount of hedging of the leveraged loan portfolios was immaterial. In recent months, several firms have increased the hedging of these pipelines, in some cases substantially, and may continue to increase their hedges in this area. While in some cases instruments are available to hedge the name specific risk<sup>7</sup>, in most cases, the hedging activity provides protection only against a systematic widening of credit spreads. Firms also indicated that they are hedging earlier in the lifecycle, which results in the firms hedging the systematic risk of commitments in the pipeline, not just the remaining "holds" of closed loans previously syndicated.

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<sup>6</sup> While second lien term bank loans are a relatively small part of the overall leveraged loan market, they have grown in popularity over the past couple years as a substitute for a HY bond offering. Collateralized loan obligations ("CLOs") can buy second lien paper while they are prohibited from buying unsecured paper (e.g., HY bonds).

<sup>7</sup> Typically, name specific hedges are used later in a deal's lifecycle when the firm no longer possesses material non-public information.

## **Capital**

In February 2007, we provided the CSE firms with a brief summary of risk management and regulatory capital practices at the CSE firms with respect to their event-driven lending business. Subsequently, we held a series of bi-lateral conference calls with each of the CSEs to provide firm-specific feedback.

One of our areas of focus was “when in the life cycle of a deal” are commitments included in the capital calculation. This determination had perhaps the biggest impact on the regulatory capital held by a CSE firm for this business. As a commitment moves through the various stages (under client consideration (“UCC”); accepted not closed (“ANC”); and closed), a firm’s economic exposure changes dramatically. For example, in the U.S., particularly with respect to financial sponsor deals, the vast majority of exposure is generally syndicated out prior to closing the loan facility.

At the time of the project, practices at the CSE firms varied from inclusion at the very earliest stages of a commitment (i.e. at one-signature or “UCC”) all the way to the most aggressive position, including only loans that are closed. At this time there is still a range of practices, however only one firm currently includes just closed loans.

During our feedback discussions with the firms, we discussed our expectation for “reasonable consistency” across the firms with respect to this issue. For example, we stated that we were not comfortable having only closed loans included in the capital calculation. While looking to reach more consistency, we did not ask the firms to change their approaches to the capital calculation at this time. Rather, we stated that we were going to use the information learned through this project (and others) to inform our holistic discussions about the capital calculation (both trading and banking book).

## MEMORANDUM

August 31, 2006

TO: Chairman Cox  
Commissioner Atkins  
Commissioner Campos  
Commissioner Nazareth  
Commissioner Casey

FROM: Robert L.D. Colby, Acting Director  
Division of Market Regulation

RE: Hedge Fund Derivative-Linked Products at CSE Firms

Over a three month period earlier this year, Division staff conducted a series of discussions with business managers, risk managers, and regulatory controllers at CSE firms focused on hedge fund derivatives. The work was motivated by rapid growth in these derivatives, where the notional amounts of such derivatives rose by thirty-six percent during 2005. The aims of this project were several: First, the staff surveyed the various structured hedge fund products and their growth by various metrics over time. In addition, the staff reviewed that the risks associated with these products were measured, monitored and limited. Finally, the regulatory capital treatment of these products was compared across the five CSE firms.

### Hedge Fund Derivatives

Hedge fund derivative-linked products, also referred to as structured hedge fund products, are derivative instruments where the reference assets are hedge fund shares, fund of hedge fund ("FoF") shares, or hedge fund indexes. The dominant structured products at CSE firms are Constant Proportion Portfolio Insurance ("CPPI") instruments that offer leveraged returns tied to hedge fund performance as well as protection of principal. For CPPI instruments, issuers allocate investment proceeds between risk-free assets (e.g., zero coupon bonds) and risky hedge fund shares. The proportion allocated to hedge fund shares is determined by an allocation formula, and varies over time depending on the performance of the hedge fund. Better hedge fund performance results in a larger proportion of the investment being allocated to risky hedge fund shares and less to risk-free assets. Conversely, poor hedge fund performance results in a lower proportion of the investment proceeds being allocated to the risky asset and a higher proportion allocated to risk-free assets. This allocation to risk-free assets during times of poor fund performance provides a natural protection for investors. However, the ultimate principal protection in these contracts comes from a guarantee by the investment bank providing the CPPI structured investment.

CSE firms also issue Total Return Swaps ("TRS") tied to hedge fund shares. TRS provide leveraged hedge fund exposure for investors, but do not provide protection of principal. Total return swaps are similar to interest rate swaps in that there are periodic exchanges of cash flows between the issuer and the counterparty. For TRS on hedge fund shares, the exchange of cash flows is tied to the performance of a hedge fund, fund-of-fund, or hedge fund index. The issuer (i.e., the CSE firm) pays the upside and receives the downside related to the performance of a hedge fund referenced asset. The counterparty (e.g. fund-of-fund manager or institutional investor) pays the downside and receives the upside related to the performance of a hedge fund referenced asset. The counterparty also pays a Libor or Fed Funds based floating rate fee to the issuer.

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The remainder of the firms' structured fund portfolios is composed of products such as Collateralized Fund Obligations ("CFO"), Portable Alpha products, and Pass-through Certificates. A CFO is a structured security that, similar to TRS, provides leveraged exposure to the performance of an underlying hedge fund. The structure consists of both a senior "debt" note and a subordinated "equity" note where an investor can gain leveraged exposure to the underlying asset of their choice. Portable Alpha strategies allow investors to generate broad market returns "cheaply" by investing in fixed income or equity indexes, and then combine those returns with an "alpha" component achieved through investments in hedge funds, fund-of-funds, or hedge fund indexes. Pass-through certificates provide a synthetic investment in all of the cash-flows from underlying hedge fund indexes or baskets of hedge fund shares. Note that this could allow smaller investors access to hedge funds.

### Risk Management Issues

The primary risk in structured hedge fund products is "gap risk" and stems directly from the dynamic nature of the hedging strategies. A dynamic hedge is a hedge that must be continually adjusted, in this case by increasing or decreasing the amount of the underlying asset held. Gap risk is the risk that the underlying hedge fund's Net Asset Value ("NAV") falls faster than an issuing bank can adjust its hedges. The gap risk is exacerbated by the fact that liquidity in the underlying hedge fund shares is quite limited relative to the liquidity in other instruments that typically must be bought and sold to implement such dynamic hedging strategies. For example, adjusting hedges is much easier when the underlying asset is equity, which trades continuously free of the restrictions associated with the partnership interests that compose hedge fund "shares".

Because of these issues, CSE risk management primarily focuses on ensuring that the structures reference diversified pools of investments, which reduces the likelihood of gap movements. Those CSE firms that sell structured products tied to the performance of single hedge fund underliers rely on enhanced transparency and liquidity, or particular structural terms to mitigate the market risks associated with these products because the benefits of diversification are not available. Examples include selling products tied to funds for which the issuing firm is the prime broker, or effectively transferring gap risk to external prime brokers.

### Capital Treatment

The treatment of structure hedge funds products under the Basle Standard is challenging. In certain cases, these products do not obviously qualify for trading book treatment given issues of liquidity and the limitations of the value-at-risk models. But the Basle Standard is largely silent about the appropriate banking book treatment for these products. As a result, with some exceptions, the CSE firms compute regulatory capital charges for the structured hedge fund products using a trading book approach, augmented with "add-on" charges in recognition that gap risk is generally not well captured in value-at-risk models. The calibration of these add-ons, however, is more of an art than a science. At present, the size of the structured hedge fund businesses at the CSE firms makes the issue relatively immaterial, despite the rapid growth cited above. However, continued rapid expansion in these activities would likely require that the Commission, as well as other supervisors of internationally active institutions, revisit the issue with an eye toward assuring consistent and suitably conservative treatment in regulatory capital computations.

We would be pleased to arrange a briefing to provide further details on this work or answer any questions.

cc: John W. White, Corporation Finance  
Linda Chatman Thomsen, Enforcement  
Andrew J. Donohue, Investment Management  
Lori A. Richards, Office of Compliance Inspections and Examinations  
Ethiopsis Tafara, Office of International Affairs

Hedge Fund Derivative-Linked Products  
Current Market Practice, Risk Management & Capital Treatment

OPSRA – Cross Firm Project

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SECURITIES AND EXCHANGE COMMISSION  
Division of Market Regulation  
Office of Prudential Supervision and Risk Analysis  
100 F St., N.E.  
Washington, DC 20549

For Additional Information, Please Contact:

Jim Giles                      202.551.5536 [GilesJ@sec.gov](mailto:GilesJ@sec.gov)  
Kevin Silva                    202.551.5546 [SilvaK@sec.gov](mailto:SilvaK@sec.gov)



# TABLE OF CONTENT

## EXECUTIVE SUMMARY

Introduction . . . . .	1
Key Findings . . . . .	2

## MARKET OVERVIEW

Significant Hedge Fund Trends. . . . .	6
Trends in Hedge Fund Derivatives/Structured Products . . . . .	7

## STRUCTURED FUND PRODUCTS AT THE CSE FIRMS

Portfolio Composition. . . . .	8
Principal Protected Notes (PPN)	
Constant Proportion Portfolio Insurance (CPPI). . . . .	10
Goldman Sachs' CPPI Transaction. . . . .	14
Fund Linked Notes (FLN). . . . .	16
Total Return Swaps (TRS). . . . .	16
Options/Warrants. . . . .	17
Other Structured Products	
Collateralized Fund Obligations (CFO). . . . .	18
Portable Alpha. . . . .	19
Pass-through Certificates. . . . .	20

## RISK MANAGEMENT

Market Risk	
Gap Risk . . . . .	21
Delta Hedging Risk . . . . .	22
Liquidity Risk. . . . .	22
Interest Rate Risk. . . . .	23
Counterparty Credit Risk. . . . .	24
Operation, Legal, and Compliance Risk. . . . .	25
Hedging. . . . .	25

## CAPITAL

Capital Treatment . . . . .	26
Capital Calculation Methodology . . . . .	27

# EXECUTIVE SUMMARY

## Introduction

Hedge fund derivative-linked products, also referred to as structured hedge fund products, are derivative instruments where the reference assets are hedge fund shares, fund of hedge fund (“FoF”) shares, or hedge fund indexes. The dominant structured products at CSE firms are Constant Proportion Portfolio Insurance (“CPPI”) instruments that offer leveraged returns tied to hedge fund performance as well as protection of principal.<sup>1</sup> For CPPI instruments, Issuers allocate investment proceeds between risk-free assets (e.g., zero coupon bonds) and risky hedge fund shares. The proportion allocated to hedge fund shares is determined by an allocation formula, and varies over time depending on the performance of the hedge fund. Better hedge fund performance results in a larger proportion of the investment being allocated to risky hedge fund shares and less to risk-free assets. Conversely, poor hedge fund performance results in a lower proportion of the investment proceeds being allocated to the risky asset and a higher proportion allocated to risk-free assets. This allocation to risk-free assets during times of poor fund performance provides the principal protection for investors.

CSE firms also issue Total Return Swaps (“TRS”) tied to hedge fund shares.<sup>2</sup> TRS provide leveraged hedge fund exposure for investors, but do not provide protection of principal. Total return swaps are similar to interest rate swaps in that there are periodic exchanges of cash flows between the issuer and the counterparty. For TRS on hedge fund shares, the exchange of cash flows is tied to the performance of a hedge fund, fund-of-fund, or hedge fund index. The issuer (i.e., the CSE firm) pays the upside and receives the down side related to the performance of a hedge fund referenced asset. The counterparty (e.g. fund-of-fund manager or institutional investor) pays the downside and receives the upside related to the performance of a hedge fund referenced asset. The counterparty also pays a Libor or Fed Funds based floating rate fee to the issuer.

The remainder of the firms’ structured fund portfolios are comprised of products such as Collateralized Fund Obligations (“CFO”), Portable Alpha products, and Pass-through Certificates that are issued by only two of the five CSE firms.<sup>3</sup> A CFO is a structured security that, similar to TRS, provides leveraged exposure to the performance of an underlying hedge fund. The structure consists of both a senior “debt” note and a subordinated “equity” note where an investor can gain leveraged exposure to the underlying asset of their choice. Portable Alpha strategies allow investors to generate broad market returns “cheaply” by investing in fixed income or equity indexes, and then combine those returns with above market returns achieved through investments in hedge funds, fund-of-funds, or hedge fund indexes. Pass-through certificates provide a synthetic investment in all of the cash-flows from underlying

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<sup>1</sup> As of 12/31/05, CPPI transactions, which can be written as either notes or options, accounted for approximately 71% of the risk and revenue in the firms’ structured hedge fund portfolios. For CPPI notes, the firms invest directly in single hedge fund shares, funds of hedge funds, or indexes on hedge funds. For CPPI options, the firm issues a put option on the hedge fund shares, and then dynamically hedges the risk associated with the option.

<sup>2</sup> As of 12/31/05, TRS accounted for approximately 8% of the firms’ structured fund portfolios.

<sup>3</sup> Lehman Brothers is the only issuer of CFO and Portable Alpha products and Bear Stearns is the only issuer of pass-through certificates. Other products accounted for approximately 21% of the firms’ portfolios as of 12/31/05.

hedge fund indexes or baskets of hedge fund shares. For a fee, the CSE firm pools investor funds together, invests in hedge fund shares, and then passes the cash-flows on to the investors on a pro-rata basis. The specifics of these transactions, as well as the CPPI and TRS transactions, are covered in detail later in this report.

Over a three month period, Office of Prudential Supervision and Risk Analysis (“OPSRA”) staff met with business managers, risk managers, and regulatory controllers to gain an understanding of (1) the various structured hedge fund businesses and products; (2) risks inherent in these products and how those risks are monitored and managed; and (3) the level of capital held against structured fund products as well as the calculation methodology used to derive the capital charge. Additionally, OPSRA staff collected and analyzed data that provides insight into growth trends and product concentrations.

This report begins with a summary of OPSRA’s key findings and is followed by:

- Hedge fund and structured fund trends
- An analysis of structured products at the CSE firms
- Inherent risks and risk management practices
- Capital held and calculation methodologies

### Key Findings

#### Business Overview

**Structured fund businesses grew by \$3.6 billion, or 36%, in 2005 to finish the year at \$13.6 billion in total notional for the five CSE firms.** All five firms experienced significant growth with Lehman Brothers experiencing the largest growth on a dollar basis, and Goldman Sachs the largest growth on a percentage basis. Across the firms, structured fund businesses grew by 36% from December 31, 2004 to December 31, 2005. Prior to the 2<sup>nd</sup> quarter of 2005, Bear Stearns had the largest structured fund business among its CSE peers. Significant growth in principal protected notes (“PPN”) and options on hedge funds at Lehman Brothers helped the firm surpass Bear as the largest CSE issuer of hedge fund linked derivative products. Goldman Sachs’ growth was driven by an increase in Constant Proportion Portfolio Insurance

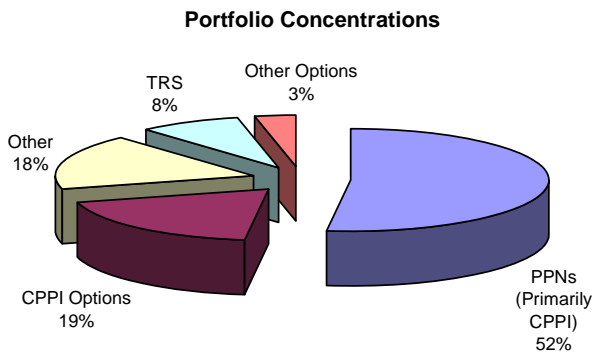
Firm	Total Notional (as of 12/31/05)	Change from 12/31/04	
		(in millions)	(in percent)
Lehman Brothers	5,180	1,277	33%
Bear Stearns	5,033	711	16%
Merrill Lynch	1,628	418	35%
Goldman Sachs	1,554	1,220	365%
Morgan Stanley	230	NA	NA
<b>Total</b>	<b>13,624</b>	<b>3,625</b>	<b>36%</b>

\*Merrill Lynch notional is based on the value of the hedge fund underliers

(“CPPI”) products with FoF and single hedge fund underliers. CPPI tied to FoFs grew more than 3 fold in 2005 from \$284 million to \$928 million while CPPI tied to single hedge funds grew more than 12 fold from \$50 million to \$616 million. [See page 8 for additional detail]

**Structured funds are dominated by two of the five CSE firms, and are heavily concentrated in CPPI notes and CPPI options.** Among CSE firms, Lehman Brothers’ and Bear Stearns’ structured funds businesses are, by far, the largest hedge fund linked businesses

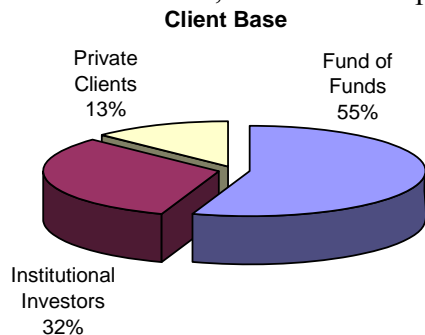
with portfolios of \$5.2 billion and \$5.0 billion notional respectively.<sup>4</sup> The firms' businesses are active across a wide range of structured fund products such as PPNs (mainly CPPI); options on hedge funds (predominantly CPPI options); and Total Return Swaps ("TRS").



CPPI notes and options make up approximately 71% of the firms' structured hedge fund linked portfolios while TRS accounts for 8%. The remainder of the portfolio is comprised of other instruments such as American, European, and Asian style options; Collateralized Fund Obligations ("CFO"), portable alpha, pass-through certificates and loans with hedge fund shares held as collateral.<sup>5</sup>

**The geographic concentration of the portfolio is 65% issued in Europe and Asia and 35% in the United States.** All firms, with the exception of Bear Stearns, are heavily concentrated in Europe. Lehman, for example, issues 79% of their structured fund products in Europe and Asia and only 21% in the United States. Bear Stearns, at the other end of the spectrum, issues 29% of their hedge fund linked products in Europe and 71% in the United States.

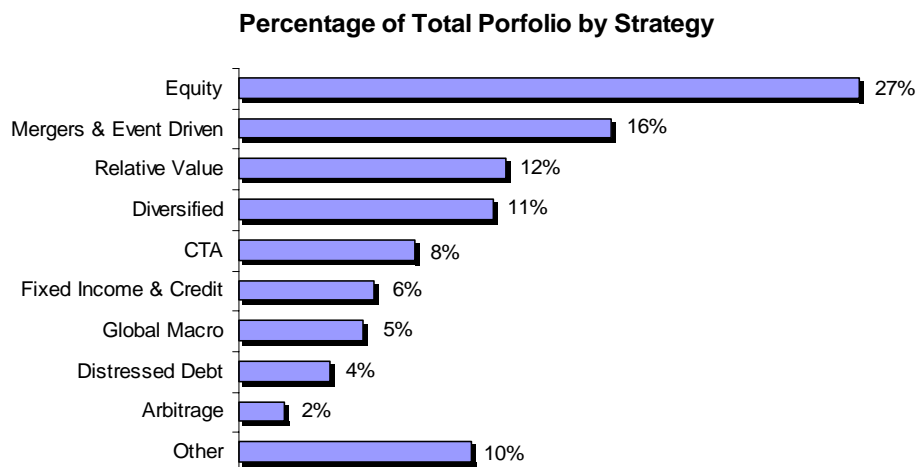
**Fund-of-funds investment managers are the leading investors in structured fund products, but institutional investors are becoming increasingly important.** Structured fund businesses issue products to Fund-of-Fund ("FoF") investment managers, or directly to institutional investors and private high net-worth clients. As of year-end 2005, fund-of-fund investment managers accounted for more than half of the structured product client base; however, CSE firms indicated that institutional investors such as banks, insurance companies, and pension funds are becoming increasingly important as institutions search for higher returns in diversified portfolios. While there are no "typical" client/product combinations, trades with FoF investment managers tend to be larger trades that provide FoF managers with the ability to offer structured share classes, generally either leveraged or principal protected, to multiple investors.



**Structured fund businesses issue products tied to FoFs, single hedge funds, or hedge fund indexes.** Lehman Brothers, Bear Stearns, and Merrill Lynch are large issuers of structured fund products tied to FoFs while Morgan Stanley and Goldman Sachs issue products tied to single hedge fund shares.<sup>6</sup> Issuing products with FoF underliers provides diversification that is difficult to achieve with single hedge funds. In general, Lehman, Bear, and Merrill limit their portfolios to FoFs that contain at least 20 hedge funds and employ 3 or more identifiable

<sup>4</sup> The other three firms, combined, have portfolios totaling \$3.4 billion notional.  
<sup>5</sup> Because our intent was to focus on structured products, we did not delve into the specifics on loans.  
<sup>6</sup> Goldman Sachs issues structured products tied to single hedge funds and FoFs, but products on single hedge funds are growing much faster than those tied to FoFs.

strategies. The three most prominent hedge fund strategies are equity long/short (which comprises 27% of the total), mergers & event driven (comprising 16% of the total), and relative value (comprising 12% of the total).



Risk Management

**The primary risk in structured fund products is “gap risk.”** Gap risk is the risk that the underlying hedge fund’s Net Asset Value (“NAV”) falls, beyond a pre-specified level (i.e., trigger level or bond floor), faster than a firm can de-leverage out of the risky hedge fund asset. The pre-specified trigger level, or bond floor, is dependent upon the amount of client equity (i.e., equity cushion) available in the transaction. For example, if a structure sets an initial bond floor at 75%, this implies a 25% cushion made possible by client equity. Therefore, the risk to the firm is that the NAV will decline more than 25%, eating through the client’s equity, subsequently exposing the firm to losses. For small movements in NAV, gap risk is minimized by an “allocation mechanism” that reduces the exposure to the risky hedge fund (or FoF) and increases investment in a risk-free asset (either cash or zero coupon bonds). Other risks inherent to structured hedge fund linked products include delta hedging risk; liquidity risk; interest rate risk; counterparty credit risk; operations, legal, and compliance risk. [See “Risk Management” beginning on page 20 for additional detail]

**For structured products with FoF underliers, gap risk management contains both qualitative and quantitative nuances.** Gap risk is primarily managed at the outset by making sure that (1) each trade conforms to investment guidelines that ensure proper diversification and acceptable liquidity, which allows transactions to withstand multiple fund defaults and significant performance deterioration within any particular investment strategy and (2) that each trade has multiple structural safeguards built into the contract. These structural safeguards include NAV triggers, volatility triggers, annual right to break trades (on most trades), etc. One of the key safeguards that businesses use is to set trigger levels well below the initial level of customer equity in the trade (e.g. a de-leverage trigger at a 3.5% decrease in NAV on a trade containing initial customer equity of 25%). This allows businesses to unwind trades well before customer equity is eaten through. Additionally, while not all firms employ hedges to manage gap risk in structured products, two of the five firms indicated that they have

purchased gap options and macro hedges (e.g., equity puts) after becoming uncomfortable with concentrations in particular fund strategies or sectors. All firms indicated that using VaR as a risk management tool for gap risk is not particularly useful because it does not focus on extreme stress events.

**Managing risk in structured funds with single hedge fund underliers requires better visibility and redemption liquidity; or “unique” structure terms.** Morgan Stanley, who gets no diversification benefit from writing transactions on single hedge fund shares, requires better visibility into hedge fund assets and better liquidity terms. The firm attains both by only writing transactions on hedge funds with assets held in Morgan’s Prime Broker (“PB”). [See “Liquidity Risk” on page 22 for additional detail] Goldman, who also writes a large amount of structured fund products with single hedge fund underliers, utilizes “unique” structural terms that transfer a majority of the risk to an external PB, and limits the PB’s right to recourse. The risk is transferred through hedge funds, to PBs (external to Goldman), who provide leveraged hedge fund exposure in margin accounts. Limited recourse is contractually agreed upon by the PB at the onset of the structured fund transaction. [See “Goldman Sachs CPPI Transaction” on page 14 for additional detail]

Capital

**Capital charges for structured hedge fund linked products are as diverse as the products themselves.** When comparing capital held to total notional balance, the two largest CSE firms in this product space—Lehman Brothers and Bear Stearns—hold comparable levels of capital while Merrill Lynch holds a comparatively large amount of capital. Other than a 15%

Firm	Capital Treatment	Notional Balance	Capital Held	Capital / Notional
LEH	Trading	\$5,180	\$132	3%
BS	Trading	\$5,033	\$201	4%
ML	Basel I	\$1,628	\$186	11%
GS	Trading	\$1,554	\$4	0%
MS	Trading	\$230	\$0	0%

operational risk charge on average revenue (which all firms hold), Goldman Sachs and Morgan Stanley hold zero capital. Morgan Stanley’s risk managers indicated that zero capital is just a “place holder” while the firm determines the appropriate way to calculate capital on structured fund products. [See page 26 for additional detail]

**VaR produces negligible capital charges for structured hedge fund products.** Because VaR does not generally capture extreme tail or stress events (i.e., gap risk), VaR capital charges tend to be negligible. As a result, the three largest players in this product space—Lehman, Bear, and Merrill—apply gap risk add-on charges that account for the vast majority of capital held. Lehman and Bear use internal models to calculate the add-on while Merrill uses a Basel I plus Reg Y add-on approach. [See page 27 for additional detail]

## MARKET OVERVIEW

### Significant Hedge Fund Trends

To a large extent, the evolution of hedge fund structured products has been a natural extension of the substantial growth experienced in the hedge fund market. Since 1993, Hedge Funds have grown by 17% compound annual growth rate (“CAGR”) from \$168 billion in assets under management in 1993 to more than \$1.1 trillion by year end 2005.<sup>7</sup> In recent years, hedge fund markets have been characterized by dramatic growth in Europe and Asia, diversity with respect to redemption liquidation periods, increased importance of institutional investors, and shifts in fund strategies. While these changes have led to increased demand for instruments such as structured products creating opportunities for investment banks, they have also created new capital and risk management challenges.

- **Dramatic Growth in Europe and Asia** – In 2001, 85% of hedge fund assets under management were in the United States while only 11% were in Europe and 4% in Asia. Europe and Asia have grown significantly since then to 22% for Europe and 10% for Asia while the US declined to 68%.
- **Redemption Liquidity is Diverse** – Approximately 48% of hedge funds allow monthly redemptions while 38% allow quarterly. Only 2% of Hedge Funds allow weekly redemptions and 5% permit only annual redemptions. Hedge funds in the US tend to be slightly less liquid than funds in Europe and Asia with an overall trend toward less liquidity. While less liquidity is desirable to hedge fund managers, this is in direct conflict with the requests of institutional investors who are pushing for shorter redemption liquidity periods.
- **Institutional Investors are becoming Increasingly Important** – Institutions such as pension funds and insurance companies are increasingly looking to hedge funds for enhanced returns while maintaining diversification. Specifically, institutions are separating market returns (beta) and outperformance of the market (alpha) into two distinct returns where they generate beta returns cheaply (e.g., through diversified index funds or index futures); and look to hedge funds as good generators of alpha. This is because hedge funds provide: (1) more flexible trading strategies; (2) a better track record of generating alpha; and (3) much broader venues for investors searching for alpha.
- **Shift in Strategy Type** – In 2001, more than half (approximately 54%) of the hedge funds utilized an equity strategy, 18% fixed income, and 28% cross assets. In 2005, cross asset strategies were utilized by 46% of hedge funds while equity and fixed income strategies declined to 46% and 8% respectively.
- **New Challenges<sup>8</sup>** – Hedge funds may face hurdles such as capacity challenges, performance challenges, and operational challenges as institutional clients become increasingly important to hedge funds. *Capacity challenges* are being driven by

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<sup>7</sup> Source: *Hedge Fund Review (HFR) Q4 2005 Industry Report*, Tass, Lehman

<sup>8</sup> Source: *Eric Vezie, Lehman Fund Derivatives meeting, February 24, 2006.*

substantial institutional capital inflow resulting in rapid growth in hedge fund assets. A hedge fund with rapidly growing assets runs the risk of becoming inflexible with respect to the size and the number of trades it can successfully transact in without negatively impacting markets. The influx of institutional investor capital has also resulted in *performance challenges* as the additional capital leads to certain strategies becoming “crowded” and perceived arbitrage potential going away. In this situation, many hedge funds may look to exit the strategy at the same time. Institutional investors also create *operational challenges* for hedge funds as institutional clients demand not only disciplined, repeatable investment processes, but also business management skills that are new to the industry (i.e., technology compliance and human resource management).

### Trends in Hedge Fund Derivatives/Structured Products

As hedge funds have grown, there has been an increase in client demand for specially structured hedge fund products through third party distributors (i.e., investment banks). Demand for hedge fund linked structured products from third party distributors is a phenomenon that began in 1998.<sup>9</sup> Credit Swiss First Boston (“CSFB”) and Societe Generale (“SG”) were the first institutions to offer these products. CSFB offered an in-house fund on hedge funds while SG offered principal protection on fund of hedge funds.

Demand for hedge fund structured products has increased significantly as many institutional investors have found that returns on traditional asset classes have become less attractive compared to hedge fund structured transactions. A majority of structured products sold to date have either been CPPI notes (where the issuer invests directly in hedge fund shares) or synthetic CPPI options where the structure gains hedge fund exposure through an option on a hedge fund underlier. One of the CSE firms estimates that the leading dealers in hedge fund derivative products are SG, BNP Paribas, UBS, and CSFB; and that in aggregate, 2004 structured hedge fund revenues for these firms amounted to approximately \$1 billion.

Similar to the overall hedge fund market, hedge fund derivative products have displayed some interesting trends in recent years. An annual study by Deutsche Bank’s Equity Prime Services Group surveyed 323 institutions, which held more than half of the global industry’s hedge fund assets, and found the following:

- 32% of the 323 institutions surveyed stated that they currently use structured products to gain exposure to hedge funds.
- Of the 68% that do not use structured products, 30% stated that they intend to use them in the near-term.
- The most prevalent use of hedge fund structured products was for the purpose of gaining leverage where nearly 41% of institutions stated that this was their primary objective in using these instruments.
- The second highest use was for principal protection where 23 % of respondents used hedge fund structured products for hedging against market losses.

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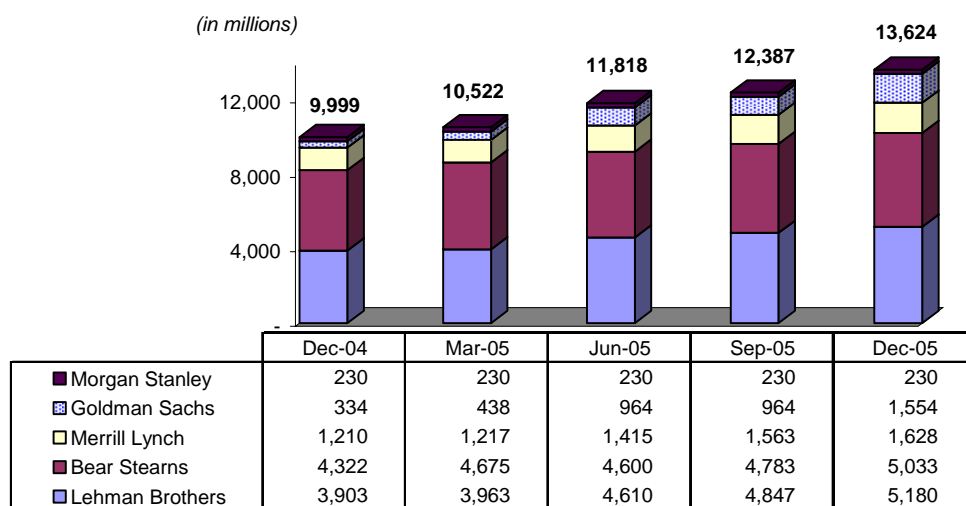
<sup>9</sup> Jason Ekaireb, Head of Hedge Fund Derivatives Trading, Goldman Sachs.



## STRUCTURED FUND PRODUCTS AT THE CSE FIRMS

Among the five CSE firms, the largest issuers of Hedge Fund Derivatives are Lehman Brothers and Bear Stearns. As of December 31, 2005, Lehman Brothers had \$5.2 billion notional in hedge fund derivative products outstanding and Bear Stearns had \$5.0 billion. Merrill Lynch and Goldman Sachs each had approximately \$1.6 billion in hedge fund derivatives outstanding while Morgan Stanley had only \$230 million. Prior to the 2<sup>nd</sup> quarter of 2005, Bear Stearns had the largest notional balance outstanding among the five CSE firms (with Lehman a close second). Lehman, however, experienced significant growth in leveraged products and principal protected notes in the 3<sup>rd</sup> quarter of 2005 allowing them to surpass Bear Stearns in total notional outstanding.

**Notional Structured Fund Balances by Firm**



\* Merrill Lynch's balances reflect the NAV of the underliers, not the notional on the structured products

Another important trend worth noting was the rapid growth experienced by Goldman Sachs' structured fund business. In December of 2004, Goldman Sachs had \$334 million in notional outstanding for structured hedge fund linked products. This business grew by 365%, or \$1.2 billion, by the end of 2005. Goldman Sachs' growth was driven primarily by an increase in CPPI products with FoF and single hedge fund underliers. CPPI tied to FoFs grew more than 3 times during 2005 from \$284 million to \$928 million while CPPI tied to single hedge funds grew more than 12 fold from \$50 million to \$616 million.

### Portfolio Composition

Principal Protected Notes ("PPN"), Options, and Total Return Swaps ("TRS") are the three largest structured fund product groups offered by the CSE firms. As of 12/31/05, the CSE firms had approximately \$13.6 billion in total notional value of hedge fund derivative products with PPNs accounting for 52% (or \$7.1 billion) of the total notional value. Options, predominately CPPI type options, made up 22% (or \$3.0 billion) of the total portfolio; and TRS comprised 8% (or \$1.1 billion) of the total portfolio. The "Other" product category,

which totals \$2.4 billion, includes instruments such as certificate pass-through and margin loan leverage products

When broken out by region, CSE structured fund businesses tend to be predominately concentrated in Europe with a small but growing presence in Asia. All firms, except Bear Stearns, issue most (if not all) of their structured fund products outside of the US. Bear Stearns was the exception where 71% of their products are issued in the US and 29% issued in Europe.

Portfolio Composition (In millions)

By Product	Bear Stearns	Lehman Brothers	Merrill Lynch	Goldman Sachs	Morgan Stanley	Total	% of Total
<b>Options</b>							
<b>CPPI</b>	\$ 2,565					\$ 2,565	19%
<b>American/European/Asian</b>	\$ 264	\$ 203				\$ 467	3%
<b>Principle Protected Notes</b>	\$ 457	\$ 3,218	\$ 1,628	\$ 1,554	\$ 230	\$ 7,087	52%
<b>TRS</b>	\$ 1,107	\$ -	\$ -			\$ 1,107	8%
<b>Other</b>	\$ 640	\$ 1,759				\$ 2,399	18%
<b>Total</b>	\$ 5,033	\$ 5,180	\$ 1,628	\$ 1,554	\$ 230	\$ 13,624	100%

By Region	Bear Stearns	Lehman Brothers	Merrill Lynch	Goldman Sachs	Morgan Stanley	Total	% of Total
<b>United States</b>	\$ 3,573	\$ 1,088	\$ 56	\$ -	\$ -	\$ 4,717	35%
<b>Europe/Asia</b>	\$ 1,459	\$ 4,092	\$ 1,572	\$ 1,554	\$ 230	\$ 8,907	65%
<b>Total</b>	\$ 5,033	\$ 5,180	\$ 1,628	\$ 1,554	\$ 230	\$ 13,624	100%

### Principal Protected Notes

For investors, principal protected notes offer the ability to gain hedge fund exposure with protection of capital at maturity, and provide structuring flexibility for institutional investors. The CSE firms generally offer two types of principal protected instruments—CPPI Notes and Fund-Linked Notes (“FLN”). Of the two, CPPI based notes account for a much larger portion of the firms’ portfolios than do FLNs.<sup>10</sup> When combined with the large amount of CPPI options issued by Bear Stearns—\$2.6 billion as of 12/31/05—CPPI instruments (i.e., notes and options) generate the most revenue and risk for hedge fund derivative products across the five CSE firms—71% (or \$9.7 billion) of the \$13.6 billion of the firms’ total portfolios is comprised of CPPI structures.

Because CPPI is the dominant product at the firms (from both a revenue and risk perspective), we include an example that helps explain the complexities and risks associated with these transactions. The discussion on CPPI transactions is followed by shorter discussions on other popular structured hedge fund products. The example in the CPPI section below describes how Lehman Brothers, who is the largest issuer of CPPI notes, structures its CPPI transactions. Following the example, we provide commentary on how this example differs from CPPI transactions at other CSE firms.

<sup>10</sup> See “Fund Linked Note” section below for additional information on why firms prefer to issue CPPI notes over fund linked notes.

### Constant Proportion Portfolio Insurance (CPPI) Notes

CPPI notes are instruments that, through the rebalancing of funds between a risky asset (i.e., a single hedge fund or a fund of hedge funds) and a risk-free asset (typically zero-coupon bonds or cash), provide investors with a way to gain exposure to hedge fund returns with principal protection. The payout of a CPPI structure is path dependent with two important elements that determine the product's final payout. First, a predetermined de-leveraging formula into risk-free assets provides *downside protection* should the underlying portfolio perform poorly. Underperformance of the fund could result in the risk that participation in hedge fund performance could fully knock out; thus, leaving the investor with a fixed income investment (e.g., a zero coupon bond) or cash investment. The second important characteristic is that CPPIs provide *increased participation in the upside* (allocation to the risky assets) when the underlying hedge fund performs well.<sup>11</sup>

The ability for CPPI instruments to provide downside protection and increased upside participation is made possible by a number of transaction terms as defined below:

- **Exposure Formula** – The exposure formula is the allocation mechanism that is used to determine the proportion of the CPPI investment in the risky asset where the exposure to the risky asset is equal to the target leverage times the NAV minus the bond floor (i.e.,  $\text{Exposure} = \text{Target Leverage} \times [\text{NAV} - \text{Bond Floor}]$ ).
- **Target Leverage Ratio** – The target leverage ratio is the “desired” leverage in the CPPI structure. The decision on where to set the ratio is generally based on the redemption liquidity provided by the underlying hedge fund, the volatility of the funds NAV, and the diversification of the fund. Secondly, firms might consider the credit worthiness of the client investing in the CPPI product.
- **Maximum Leverage** – is the upper bound of leverage that a CSE firm is comfortable providing through a CPPI structure. If leverage in the CPPI instrument exceeds the maximum leverage, firms will de-lever to decrease the amount of leverage being provided. When structures de-lever, shares in the risky asset (i.e., hedge fund shares) are redeemed and proceeds are used to pay down borrowed funds. Similar to the target leverage ratio, the maximum leverage ratio is primarily a function of the underlying hedge funds liquidity, volatility, and diversification.
- **Minimum Leverage** – is the lower bound of leverage in a CPPI structure.
- **Bond Floor (“BF”)** – specifies the level of principal protection, which generally begins at an initial “discounted” level, and then accretes to 100% of the principal protection at maturity. The bond floor is set to the present value of a zero coupon bond with a maturity equal to that of the CPPI structure.

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<sup>11</sup> Not all CPPI structures allow for increased participation in the upside. Morgan Stanley and Goldman Sachs, for example, do not allow more than 100% participation.

- Maturity – varies from structure to structure with common maturities ranging from 3 to 7 years. CPPI structures can be held to maturity or may be redeemed early. In the event of an early redemption, the investor is not entitled to the full “principal protection” amount. Instead, the investor receives a discounted amount that is equivalent to the bond floor at the time of redemption.
- Trigger Event – is the minimum level to which the NAV can fall before the structure knocks out. In the event of a knock out, the structure fully divests from the risky asset and invests in the risk-free asset. The trigger event is usually set at some level above the bond floor (e.g., 7% above the bond floor) to allow for the amount of time it takes to redeem hedge fund shares. Additionally, the trigger level accretes with the bond floor as time passes.

While parameters may differ from firm-to-firm (and from one transaction to the next), the assumptions used in our example generally reflect those encountered at the CSE firms.

Initial investment in the risky asset = 100%

Capital (or Principal) Guarantee = 100% of principal at maturity

First de-leverage point – Initially set at 90% of the risky asset’s NAV, and then accretes to 120% at maturity (which provides a constant 20% cushion to the 70% bond floor parameter below). The first de-leverage point is similar to a maintenance margin. The structure will not de-lever until this line is reached, which minimizes the buying and selling the client has to face over time.

Trigger Line – Initially set at 77% of the risky asset’s NAV, and then accretes to 107% at maturity (which is a constant 7% cushion above the 70% bond floor parameter below). The trigger line is similar to a clean-up call where the firm will completely divest from the risky asset and buy zero coupon bonds or pay out the remaining proceeds in the form of cash.

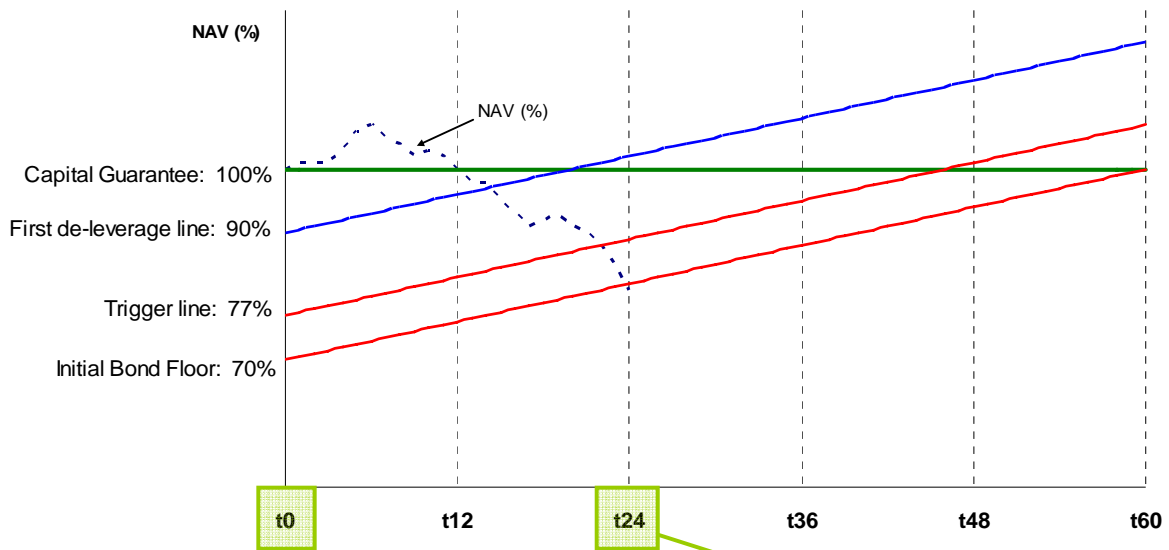
Bond Floor (initially) = 70% of the risky asset’s NAV, and accretes to 100% at maturity. A bond floor can be fixed or floating. If the bond floor floats, then interest rate risk is mitigated as interest rates rise or fall. A fixed bond floor can either be fixed at a specific value (i.e., 70%) or can accrete at a fixed rate (i.e., will have an initial value of 70%, but will accrete to 100% at maturity using straight line appreciation). The latter is considered fixed because the accretion schedule is fixed subjecting the issuer of the CPPI note to interest rate risk.

Target Leverage = 3.33x (in this example)

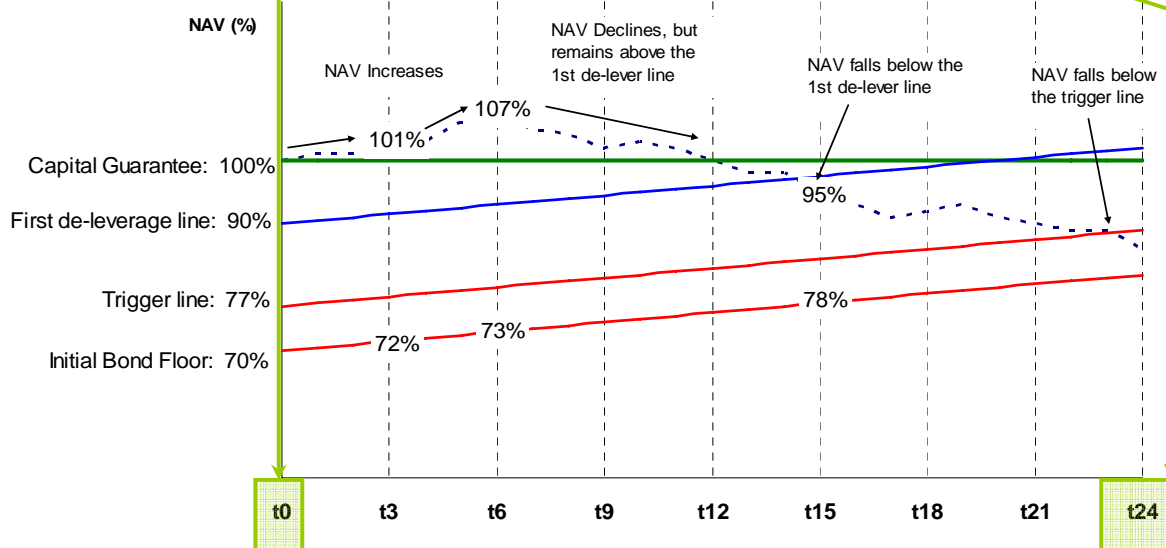
Visually, these parameters are represented as shown in the graphs below. The investment in the risky asset is driven by the change in the NAV (as represented by the dotted line). The capital guarantee of 100% is represented by the solid green line, the first de-leverage point by the solid blue line, and the trigger line and bond floor by the solid red lines. The decision of whether to lever up or de-lever in the CPPI structure is driven by the relationship of the NAV to the first de-leverage line, the trigger line, and the bond floor.

The top graph depicts a 5-year CPPI structure and the bottom graph represents the first 2-years of the 5-year structure. The 2-year view, with greater detail, is provided to better illustrate the impact that increases and decreases in the NAV have on the instrument. The examples that follow the graphs reference the bottom graph (the first 2-years of the structure), and assume quarterly liquidity.

### CPPI Structure (5-Year Maturity)



### First 2-years of the structure (Assuming Quarterly Liquidity)



Time Point	NAV (%)	Capital Guarantee (%)	First de-leverage line (%)	Trigger line (%)	Initial Bond Floor (%)	Percentage Invested in Risky Asset (%)
t0	90%	100%	70%	77%	70%	100%
t3	101%	100%	72%	77%	70%	100%
t6	107%	100%	73%	77%	70%	113%
t9	107%	100%	73%	77%	70%	113%
t12	107%	100%	73%	77%	70%	113%
t15	95%	100%	78%	77%	70%	57%
t18	95%	100%	78%	77%	70%	57%
t21	95%	100%	78%	77%	70%	57%
t24	95%	100%	78%	77%	70%	0%

## NAV Increases

For an increase in NAV, there are two basic scenarios to consider: (1) the NAV (%) increases, but by an amount less than the bond floor accretes; and (2) the NAV increases by more than the bond floor accretes. It is important to note that the increase in the NAV must be greater than the accretion in the bond floor for the CPPI to lever up.

If, for example, the *NAV increases, but by less than the bond floor accretes* (say from 100% at t0 to 101% at t3) [See bottom graph above], you might expect the structure to lever up, but this is not the case—the exposure to the risky asset remains unchanged. This is because the NAV only increased by 1% while the bond floor accreted by 2% (from 70% to 72%); thus, resulting in the following exposure calculation:  $3.33 \times (101 - 72) = 97\%$ . Additionally, the structure will not de-lever from 100% to 97% (as the calculation suggests) because the NAV (%) is greater than the first de-leverage line. This example shows that it is possible to experience an increase in the NAV, but not an increase in exposure to the risky asset.

If the *NAV increases by more than the bond floor accretes* (say from 100% at t0 to 107% at t6), then the amount of exposure to the risky asset will increase. This is because the NAV increased by 7% while the bond floor only accreted by 3%. The exposure will increase from 100% of the risky asset to 113% [ $3.33 \times (107 - 73) = 113\%$ ]. The structure would have to borrow an amount equivalent to 13% of the NAV to purchase the additional shares.

## NAV declines

When considering the impact of a decrease in NAV on the CPPI structure, there are three basic scenarios to consider: (1) the NAV declines, but not enough to fall below the first de-leverage line; (2) the NAV falls by more than the first de-leverage line (but remains above the trigger line); and (3) the NAV falls below the trigger line.

If the *NAV declines, but remains above the first de-leverage line*, then the CPPI structure will not de-lever, and the exposure to the risky asset will remain at its highest level—113% in the example above. It is important to note that the de-leverage line accretes at a constant proportion to the bond floor—20% above the bond floor in the example above—as you move toward maturity. The implication is that the risky asset should (at a minimum) provide a rate of return comparable to (or preferably greater than) the risk-free asset.

If the *NAV falls below the first de-leverage line* (as it does between t12 and t15), then the structure will de-lever and the portion allocated to the risky asset will be reduced according to the exposure formula. If, for example, the NAV declines by 12% (from 107% to 95%), the exposure to the risky asset will decrease from 113% to 57% [ $3.33 \times (95\% - 78\%) = 57\%$ ].

If the *NAV falls below the trigger line* (as it does between t21 and t24), then the structure will fully divest from the risky asset and the proceeds will be used to purchase zero coupon bonds.

The CPPI example above is often referred to as a “classical” CPPI structure where the note issuer (i.e., the CSE firm) uses investor proceeds to purchase shares in a reference hedge fund

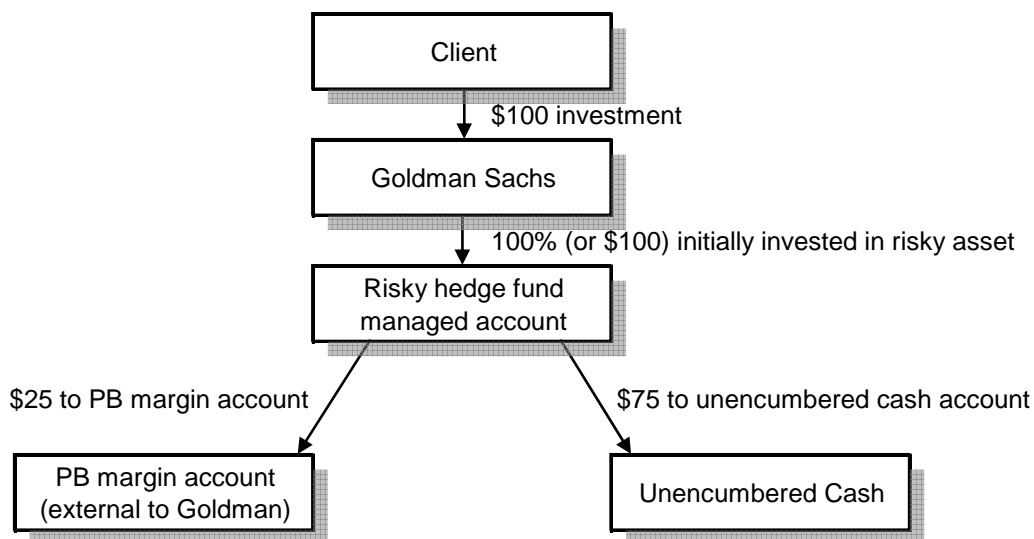
and passes the economics of the structure on to the investor. Alternatively, CPPI structures can be created synthetically where the instrument offers hedge fund exposure, but achieves the exposure by purchasing a zero coupon bond (which at maturity provides principal protection) and a call option on a referenced portfolio. Similar to the classical structure, a synthetic CPPI instrument utilizes an allocation formula to determine the exposure to the risky asset; and passes the economics of the call option on to the investor.

Of the five CSE firms, Lehman Brothers is the largest issuer of classical CPPI notes while Bear Stearns issues a large amount of synthetic instruments (i.e., CPPI options). Approximately 62% of Lehman's structured funds portfolio consists of classical CPPI notes while approximately 51% of Bear's portfolio is made up of synthetic style CPPI options. For all CSE firms, across all structured product types, the total portfolio composition contains 52% classical CPPI notes and 19% synthetic CPPI options with the remainder being TRS and other transactions. Both classical and synthetic CPPI structures are exposed to "Gap risk," but classical structures contain the additional burdens associated with administering a referenced hedge fund; and can be exposed to interest rate risk that arises from fixed bond floors. In contrast, synthetic structures (i.e., a zero coupon bond plus a call option) exposes the firm to the risk of delta hedging the option. These risks, along with other differences between firms' CPPI structures (such as visibility of hedge fund assets and redemption liquidity), are discussed in detail in the Risk Management section.

Goldman Sachs CPPI transaction on single hedge fund shares – Goldman's CPPI structures, on single hedge fund shares, are "unique" in that the structure transfers most if not all of the gap risk to an external prime broker (e.g., Morgan Stanley's prime brokerage). Goldman Sachs achieves the transfer of gap risk with two structural terms that are not found in other firms' CPPI transactions: (1) Goldman uses an external prime broker to provide leveraged hedge fund exposure and (2) Goldman uses non-recourse contracts to ensure that the external prime broker only has recourse to the initial margin posted. The easiest way to understand this transaction is through an example. Similar to other CPPI transactions, Goldman's structure uses an exposure mechanism to allocate funds between a risky asset and a risk-free asset.

Goldman's CPPI structure is initially set up as follows:

1. Goldman receives a \$100 investment from a client.
2. 100% (or \$100) is initially invested in the risky hedge fund asset. It is important to note that the "risky asset" is a combination of two accounts—a prime brokerage account (external to Goldman Sachs) and an unencumbered cash account. Both accounts are administered through a separately managed hedge fund account.
  - a. Prime Brokerage margin account – Through a hedge fund, Goldman obtains \$100 worth of hedge fund exposure for their client by posting \$25 worth of margin.
  - b. Unencumbered cash account – The remaining \$75 of the initial investment is deposited in a cash account at a bank, which provides principal protection.



A key component to this transaction is the fact that Goldman Sachs does not use their prime brokerage to provide leverage. By generating leverage through an external prime broker, Goldman Sachs is able to shift most of the gap risk away from Goldman and to the prime broker.<sup>12</sup> For example, if the market collapses and the hedge fund gaps down by \$30, the CPPI allocation formula would dictate that \$0 be allocated to the risky hedge fund. The prime broker, who has the initial \$25 margin, would request \$5 more in margin to cover the current position, and another \$25 in margin to re-establish \$100 worth of hedge fund exposure—neither of which would be paid. Instead, the hedge fund would close out the positions with the prime broker leaving the PB with a \$5 loss. While the PB may request the additional margin, there is no expectation that the \$5 will be paid because they are required to sign a limited recourse contract at the onset of the CPPI transaction, which only provides for recourse to the initial margin posted.

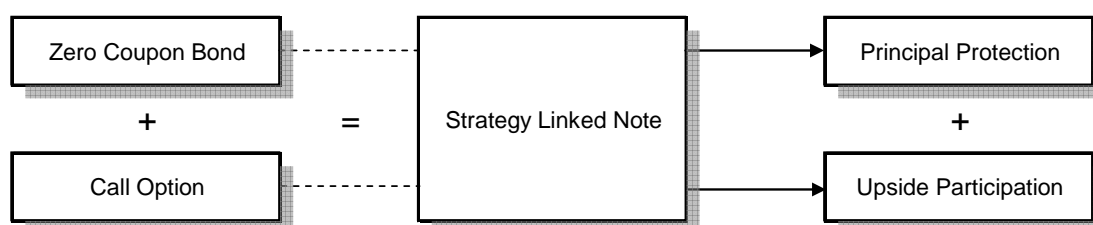
The limited recourse contract also provides another key component to this transaction—protection of the \$75 in the unencumbered cash account. If the CPPI structure knocks out, the \$75 is paid to Goldman Sachs (which is used to provide principal protection), with the PB having no recourse to the cash. Goldman Sachs indicated that prime brokers are willing to enter into limited recourse transactions because (1) the PB makes their credit decision based on the margin posted, not on the value of the excess equity (i.e., the \$75 in the unencumbered cash account), and (2) the PB imposes a slightly higher margin-to-equity premium for giving up the right to recourse.

<sup>12</sup> Because of the allocation mechanism, it is possible for Goldman to be exposed to a small portion of the gap risk. The allocation formula contains a multiplier that dictates the amount of client equity required and leverage allowed in the structure. If, for example, the target leverage is 4 times, this equates to a multiplier of 4. The reciprocal of the multiplier (e.g., 1/4, or 25%) is the level of client equity held at the PB as margin. If a decline in the NAV causes the multiplier to increase, say to 4.9, but not enough to trigger a de-leverage event, then Goldman will be exposed to a small portion of the gap risk. At a multiplier of 4.9, Goldman is exposed to just under \$5 of the \$25 gap risk ( $1/4 - 1/4.9 = 25\% - 20.41\% = 4.59\%$ ).



### Fund Linked Notes (“FLN”)

Fund linked notes are hybrid securities that contain elements of both debt and hedge fund investments. As depicted in the diagram below, FLNs are constructed by packaging a call option and a zero coupon bond where the zero coupon bond accretes to par at maturity (providing principal protection), while the call option provides exposure to the hedge fund’s return. Unlike the CPPI based PPN, there is no allocation mechanism that provides rebalancing between the risky asset and risk free asset; therefore, the final payout is not path dependent. Additionally, participation in the underlying fund(s) is fixed (i.e., there is no risk of the structure knocking out).



As previously discussed, CSE firms have issued much more CPPI notes than FLN. The preference of CPPI issuances over FLN issuances is, at least in part, due to the arduous task of delta hedging call options, on relatively illiquid hedge fund underliers, in FLN structures. Whereas FLNs require delta hedging of call options, CPPI based notes transfer this risk to clients through the formulaic nature of the exposure mechanism.<sup>13</sup>

### **Total Return Swap (“TRS”)**

Similar to principal protected notes, TRS provide leveraged hedge fund exposure. TRS do not, however, provide protection of principal. Total return swaps are similar to interest rate swaps in that there are periodic exchanges of cash flows between two counterparties. The uniqueness, in TRS, comes from the referenced assets, which are typically portfolios of hedge funds, hedge fund indexes, or (to a lesser degree) single hedge funds. The cash flows between a TRS issuer and a counterparty are as follows:

Issuer (i.e., the CSE firm)

- Pays the upside related to the performance of the reference portfolio, fund, or index.
- Receives the downside related to the performance of the reference portfolio, fund, or index plus a Libor or Fed Funds based floating rate fee.<sup>14</sup>

<sup>13</sup> While the CPPI structure vastly mitigates the delta hedging requirements seen in FLN structures, there may be market risk if the payoff to the investor is not strictly aligned with the reallocation performed by the firm. While we confirmed with Goldman and Lehman that the payout in their then current portfolio is aligned with their reallocation mechanisms, this may not always be the case going forward. Firms might rebalance differently than what the payout assumes for various reasons including taking a trading view or reduction of transaction costs.

<sup>14</sup> The gap risk associated with TRS structured fund products is taken into consideration when calculating the spread over Libor (or the Fed Funds rate). Bear Stearns accomplishes this in their Equity Capital Model.

The counterparty (i.e. fund-of-fund manager or investor)

- Pays the downside related to the performance of the reference portfolio, fund, or index plus a Libor or Fed Funds based floating rate fee.
- Receives the upside related to the performance of the reference portfolio, fund, or index.

Bear Stearns is by far the largest issuer of TRS on hedge funds with \$1.1 billion in outstanding notional balance (as of December 2005) with Merrill Lynch a distant second at \$93 million.<sup>15</sup> At Bear, the vast majority of TRS are done on an initial collateral plus mark-to-market basis without consideration for counterparty creditworthiness. This is because a majority of the counterparties are unrated. Alternatively, for the few TRS counterparties that are rated, collateral is posted based on the counterparty's creditworthiness ranging from unsecured for highly rated counterparties to 25% to 50% initial collateral, plus mark-to-market, for less creditworthy counterparties.

Typical TRS transactions provide 2 to 4 times leverage and incorporate annual deal break clauses where either side can terminate the transaction, and termination triggers for sharp NAV declines or material changes in reference asset volatility. Additionally, Bear Stearns and Merrill Lynch mitigate their market risk exposure by purchasing the underlying hedge fund(s) or hedge fund index leaving them with counterparty credit risk to the investor.

### **Options and Warrants**

Among CSE firms, the largest issuer of call options and warrants on hedge funds (which are generally executed over-the-counter) is Bear Stearns. As of year end 2005, Bear Stearns had \$2.8 billion notional in options and warrants outstanding. The vast majority of those instruments, \$2.6 billion, were CPPI options while \$264 million were American, European, and Asian style options. The referenced assets for the instruments are typically not single funds, but rather a portfolio of funds or a hedge fund index. Maturities for options and warrants range from one to seven years; and the pay-off to the investor is usually cash-settled. Aside from Bear Stearns, the only other CSE firm active in this product space is Lehman Brothers who had \$203 million in outstanding options as of December 31, 2005. In total, options and warrants (predominantly CPPI options) accounted for 22% of the firms' total hedge fund derivative portfolios.

### **Other Structured Fund Products**

Other structured fund products include Collateralized Fund Obligations ("CFO"), portable alpha structures, and pass-through certificates.<sup>16</sup> The only firm issuing CFO or portable alpha structures is Lehman Brothers. Bear Stearns is the only issuer of pass-through certificates.

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<sup>15</sup> In Merrill Lynch's data submitted to OPSRA, the last balance available for TRS products was as of 11/30/05.

<sup>16</sup> Firms also issue a small amount of Periodic Reset Options ("PRO") and Black Scholes Options on hedge fund shares. These are not discussed because of their relatively small balances and limited growth.

### Collateralized Fund Obligation

A CFO is a structured security that, similar to TRS, provides leveraged exposure to the performance of an underlying hedge fund. The capital structure of a CFO resembles that of a traditional Collateralized Debt Obligation (“CDO”) where the instrument is typically issued from a Special Purpose Vehicle (“SPV”) and consists of both senior debt and subordinated equity tranche securities. In a CFO, an investor gains leveraged exposure to the underlying asset of their choice where their loss is limited to the principal amount of the subordinated notes. From the issuer's perspective, this structure allows the firm to separate the financing from the leveraged investment, which gives the firm more funding, pricing, and gap risk management options.

A typical CFO transaction might be structured as follows:

1. Senior Note (Debt) – The issuer (i.e., CSE firm), through an SPV, underwrites senior notes that can either be held by the issuer, or sold to institutional investors such as banks. If the senior note is sold, then the issuer can either offload the gap risk to the investor, or can retain the gap risk by concurrently issuing Credit Default Swap (“CDS”) protection to the debt buyer. Risk managers at Lehman Brothers indicated that their preference is to retain the gap risk by holding the senior note and hedging the risk because it is more cost effective than offloading the risk by selling the note.
2. Subordinated Note (Equity) – is sold to investors seeking equity type exposure to hedge fund returns.
3. NAV Appreciates – During the term of the CFO transaction, if the NAV of the underlying hedge fund appreciates, the SPV can issue additional senior notes to finance the purchase of new shares in the underlying hedge fund(s). When issuing additional senior notes and purchasing new shares, the structure is required to maintain a target level of subordination.
4. NAV Declines – If the NAV of the underlying hedge fund declines, the SPV will buy back a corresponding portion of the senior notes by redeeming the shares in the underlying fund. Again the structure maintains the target subordination.
5. Payout – The payout on the subordinated note is equal to the maximum of the fund NAV (at maturity) minus any outstanding principal balance of the senior notes, or zero. The payout on the senior note is simply a Libor based coupon (e.g., Libor plus 30 basis points).

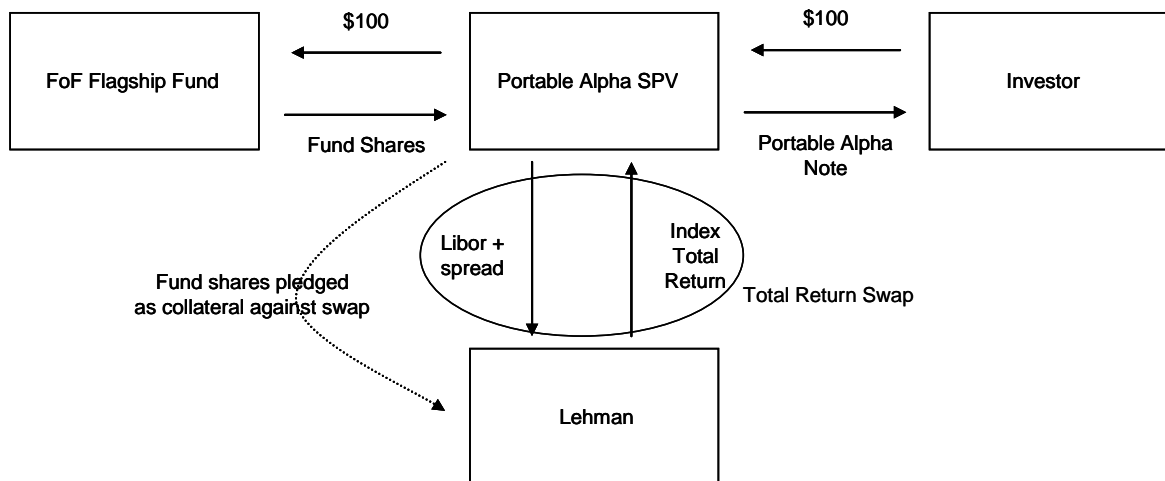
## Portable Alpha<sup>17</sup>

Portable Alpha is a strategy that allows the alpha return that is generated in one investment to be transported onto a market return benchmark. From the CAPM model ( $R_i = \alpha + \beta R_m$ ), 'beta' refers to the return on a portfolio attributable to the market and 'alpha' refers to return in excess of the market return. Portable Alpha refers to the idea that alpha and beta can be generated separately. That is, the investment vehicles that generate alpha are uncorrelated with the investment vehicles that generate beta. The alpha is then ported onto the beta.

Investors have always been able to duplicate the basic idea of portable alpha. As an example, an investor could put part of a portfolio into a fund to generate alpha and simultaneously enter a total return swap on an index to get the beta. The investor would, however, not be able to invest the entire portfolio in the alpha-generating vehicle and would need to keep part of the portfolio as cash in order to meet the payments of the total return swap. Investing in Lehman's product allows for the entire portfolio to be invested in the alpha generating vehicle.

The typical Portable Alpha product at Lehman gives the investor exposure to fixed income markets via the return on the Lehman Aggregate Index as well as exposure to hedge funds via the return on various FoFs. The alpha return from the FoFs investment is combined with the market return of the Lehman Aggregate Index to provide the investor with alpha and beta returns.

In this example, the beta is generated via derivatives as the return on an index (either S&P or a fixed income index), and the alpha is generated as the return to a FoF.



Following the diagram above, the cash flows are as follows:

1. The investor pays \$100 and in return receives a Portable Alpha Note.

<sup>17</sup> Source: Michelle Danis, "Lehman Brothers' Portable Alpha" write-up: [J:\Ora\ Other\CROSS-FIRM ISSUES\Cross-firm Basel issues\Lehman Brothers\Portable Alpha.doc](#)

2. The \$100 investment is used by an SPV to purchase shares of the FoF Flagship Fund, which invests in any type of particular strategy.
3. Simultaneously, Lehman enters into a total return swap with the SPV with a notional equal to the amount invested in the FoF Flagship Fund. Note that the notional of the swap ramps up and down monthly as the NAV of the FoF changes. Lehman receives LIBOR plus a spread and pays the return of an index (either the S&P or a fixed income index). The fund shares are pledged as collateral against the swap.
4. The return on the note equals the return of the FoF “Flagship Fund” plus the return of the Index less the financing charge on the swap. The investor gets exposure to the index (the beta, or market return) through the TRS transaction and to the hedge funds (the alpha, or excess return), which could come from any number of investment strategies.

Portable alpha is one of Lehman’s fastest growing structured hedge fund products. Lehman currently has \$1 billion notional in this product, with \$900 million referencing a fixed income index and the remainder referencing the S&P 500. The firm expects that this product base will more than double by year end 2006. The typical Portable Alpha Note has a tenor of from one to five years.

### Pass-through Certificates

Pass-through certificates provide a synthetic investment in all of the cash-flows from the underlying index or basket. Bear Stearns is the only firm issuing pass-throughs on hedge fund returns. Additionally, all of Bear’s issuances have been in Europe or Tokyo (none in the U.S.). Unlike TRS, there is no gap-to-zero risk for the firm because the certificate is fully funded by the investor (e.g., the investor buys a pass-through certificate for \$100, and Bear purchases \$100 of the underlying asset and simply passes the economics of the transaction to the investor). Bear Stearns’ typically earns a 30 to 50 basis point annual fee on this type of transaction.

## RISK MANAGEMENT

Major risk factors for hedge fund derivative products include market risk, counterparty credit risk, and operations risk (including legal and compliance risk). There are four major market risks that risk managers at CSE firms focus on: (1) Gap Risk; (2) Delta Hedging Risk; (3) Liquidity Risk; and (4) Interest Rate Risk. The predominant risk is gap risk—the risk that the underlying hedge fund’s NAV falls, beyond a pre-specified level (i.e., trigger level), faster than a firm can de-leverage out of the risky hedge fund asset.

The method used to manage these risks is dependent on the business model utilized by the firms, and on the product type. For structured fund products based on multiple underliers (i.e., FoFs and hedge fund indexes), firms find that there is a lack of transparency into the hedge fund assets and that there are liquidity constraints. Because of these constraints, risk management primarily focuses on ensuring that the structures contain diversified pools of investments, and that they employ multiple contractual safeguards (i.e., NAV triggers,

volatility triggers, and rights to break trades). Those firms with business models that provide structured products on single hedge funds (i.e., Morgan and Goldman) rely on enhanced transparency and liquidity, or “unique” structural terms to mitigate the market risks associated with these products because the benefits of diversification are not available.

Risk classification (i.e., market risk or counterparty credit risk) is also a function of the product type. Where as TRS primarily generate counterparty credit risk,<sup>18</sup> the other products generally create market risk for the firms in the form of gap risk or delta hedging risk.

## **Market Risk**

### Gap Risk

For small movements in NAV, gap risk is minimized as the CPPI allocation mechanism reduces the exposure to the risky hedge fund (or FoF) and increases investment in the risk-free asset. However, the benefit of the CPPI allocation mechanism may be diminished for funds with volatile NAVs, especially if the fund has a long redemption period (i.e., higher liquidity risk) where the NAV has a longer period of time to gap down before the firm is able to de-lever out of the risky asset by redeeming hedge fund shares. Where the firm provides leverage for the portion of the portfolio allocated to the risky asset, it has recourse only to the risky asset; therefore, gaps can leave the firm facing losses.

Risk managers at most of the CSE firms indicated that monitoring and managing gap risk encompasses both qualitative and quantitative nuances. The primary means of managing gap risk occurs at the outset where due diligence is performed to ensure that (1) each trade conforms to investment guidelines that promote proper diversification and acceptable liquidity and (2) that each trade has multiple structural safeguards built into the contract. Lehman refers to this as “*qualitative*” risk management, which (at both Lehman and Bear) is undertaken by front-office personnel. On an ongoing basis, independent risk managers perform the qualitative risk management functions of monitoring diversification levels and structural safeguards.

Ensuring proper levels of diversification and acceptable liquidity increases the likelihood that a transaction can withstand multiple fund defaults and significant performance deterioration within any particular investment strategy. Diversification is monitored in various fashions, but the firms generally focus on concentrations in FoFs, concentrations in single hedge funds, and hedge fund strategy concentration. Firms also closely monitor the liquidity (i.e., redemption period) for underlying hedge funds. With respect to FoF and single hedge fund concentrations, firms tend to be concerned with the size of the largest FoF and single fund positions as well as what their weights are in the total portfolio. With respect to strategy diversification, CSE firms

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<sup>18</sup> For TRS that are based on hedge fund share collateral, the firm may be exposed to market risk if the swap is not completely hedged at issuance. Typically, credit departments only approve TRS trades where trade approval is dependent on the credit worthiness of the counterparty (e.g., AAA rate pension funds). However, in most cases, firms have determined that they do not have recourse to a credit worthy counterparty, and generally rely on large initial margins (25% to 50%) plus mark-to-market to compensate for the risk. The market risk department will monitor these risks along with the market risks from other products (e.g., gap to zero). See the “Counterparty Credit Risk” section below for additional details.

try to minimize their exposure to individual strategies by diversifying across many strategies. This typically results in a total hedge fund derivative portfolio with strategies that closely mimic the overall hedge fund industry.

Another important aspect of “qualitative” risk management is ensuring that the proper structural safeguards are in place. Structural safeguards include NAV triggers, volatility triggers, and annual rights to break trades. One of the key safeguards that the businesses use is to set their trigger levels well below the initial level of customer equity in the trade (e.g. a first de-leverage trigger for a 3.5% decrease in NAV on a trade that has initial customer equity of 25%). Assuming a multi-stage gap, this early trigger is a very valuable risk mitigant. Basically, this allows the business to unwind trades, or de-lever out of risky assets, well before customer equity is depleted.

Managing gap risk also requires “*quantitative*” risk management, which is undertaken by independent risk managers. In addition to the ongoing qualitative risk management mentioned above, independent risk managers monitor first and second order Greeks, VaR measures, Expected Tail Loss measures, and major trade exposure detail. First and second order Greeks (e.g., delta, gamma, and vega) are captured within VaR, but since VaR measures do not generally focus on extreme tail or stress events (like those that generate gap risk), firms also look at specific tail loss measures and maximum exposure (i.e., gap-to-zero) measures.

Lehman sets limits based on VaR, on strategy and portfolio concentration, and on expected tail losses. Expected tail losses measure the potential mark-to-market loss on positions due to gap risk in underlying fund NAVs. These losses represent the distance below the bond floor when Lehman shocks the NAV on each trade. Bear Stearns and Merrill Lynch, in addition to VaR and concentration limits, set limits based on “gap-to-zero” measures where the gap exposure is net of customer equity held. These limits generally include maximum gap-to-zero exposure for the entire portfolio; and maximum gap-to-zero exposures to any one FoF family, FoF, or single hedge fund.<sup>19</sup>

### Delta Hedging Risk

For options (including CPPI options), warrants, and certain principal protected notes (i.e., FLNs), the firms are exposed to market risk as they are obligated to deliver hedge fund performance related returns to the investors in exchange for an upfront and/or periodic payment. Hedge fund options create market risk exposure for CSE firms as they delta hedge the call options that they have written. This exposure is exacerbated by the relative lack of liquidity in the underlying hedge fund shares compared to more common option products in the equity derivatives market.

### Liquidity Risk

Liquidity risk in structured fund products arises when a CSE firm is unable to redeem hedge fund shares due to redemption constraints. At firms with structured fund products based on

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<sup>19</sup> See the “Capital Calculation Methodology” section below for additional information on how the firms calculated expected tail losses and gap-to-zero.

multiple underliers (i.e., FoFs and hedge fund indexes), liquidity risk is mitigated through diversification, and by limiting the leverage provided for less liquid funds. For example, a structure containing a diversified FoF with monthly liquidity would be allowed more leverage than a less-diversified FoF with quarterly liquidity.

Morgan Stanley, whose business model relies on structured products tied to single hedge funds, depends on complete transparency and enhanced liquidity to mitigate the market risks associated with these products as the benefits of diversification are not available. To date, Morgan has achieved this by only doing transactions where they are the sole prime broker; and have only provided CPPI structures on one fund—Cheyne.<sup>20</sup> Additionally, risk managers stated that the firm must be able to get a perfected interest in the underlying collateral, meaning that the hedge fund must set up a separate managed account for the assets on which a CPPI is written. Having a separate managed account allows the hedge fund to provide separate liquidity terms for the CPPI structure than those offered in the main hedge fund.

With respect to their Cheyne CPPI trade (which accounts for \$165 million of their total \$230 million portfolio), Morgan Stanley gets five day liquidity versus the normal 30 day liquidity in the main hedge fund. Having a separate managed account (with the associated upfront disclosure to all parties) also allows the firm to “see across the wall” into the underlying positions held by the firm. Thus, not only does Morgan Stanley (as Prime Broker) have visibility into the positions, but Morgan Stanley structured funds personnel (as the writer of the CPPI note on the separate managed account) also have daily visibility into the positions in the managed account. Daily visibility gives the firm the ability to take offsetting positions to hedge positions in the managed account if they become concerned about the risk of positions gapping down during the five day redemption period.

### Interest Rate Risk

Principal protected notes create interest rate risk when a structure’s investment allocation formula is linked to a fixed bond floor that does not vary with movements in interest rates. This is especially true for structures that allocate their risk-free portion to cash (instead of purchasing a zero coupon instrument at inception), while tying the level of guaranteed principal to a fixed income instrument (e.g., to the accretion of a zero coupon bond’s value). Not purchasing a zero coupon bond at inception creates uncertainty about the cost of purchasing in the future should the structure knock out (i.e., fully de-lever out of the risky asset into the risk free asset). For example, if a five year structure gaps down by 25% and knocks out in the second year, and the principal guarantee is 100% at maturity, then the firm will have to decide how to meet the 100% guaranteed principal payment in three years. If a zero coupon bond were purchased at inception (for 75% of the capital guarantee), the bond would simply accrete to 100% at maturity, irrespective of movements in interest rates, and the proceeds would be used to make the principal payment. Since, in this example, a zero coupon bond was not purchased at inception, the current price of purchasing the same bond may be more or less than the proceeds available (depending on movements in interest rates over the past two years).

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<sup>20</sup> The business stated that they would also do these transactions without being the prime broker as long as all transaction data were provided to Morgan Stanley on a daily basis.



Some firms, such as Lehman, provide the investor with a fixed bond floor in which the firm takes on the interest rate risk directly.<sup>21</sup> This benefits the investor because they will not be knocked out of the investment (or have to de-lever) solely based on movements in interest rates. Alternatively, other CPPI based principal protected notes contain floating bond floors that may cause the structure to knock out or de-lever due to changes in interest rates even if the underlying hedge fund performance does not suffer.

### **Counterparty Credit Risk**

The predominant driver of counterparty credit risk is Total Return Swaps (“TRS”) secured by hedge funds shares. This exposure is mostly borne by Bear Stearns who, as of 12/31/05, was the issuer of 92% of all TRS outstanding. The remaining 8% is attributable mainly to Merrill Lynch who issues TRS directly to investors, and Lehman who uses TRS in their portable alpha structured products.<sup>22</sup>

The magnitude of the counterparty credit risk in a TRS is captured in the “gap-to-zero” amount, which represents the notional value of the contract less the collateral posted or the embedded equity (for the investor) in the contract. If the underlying hedge fund(s) or hedge fund indices gap down in excess of collateral posted, the CSE firm would have a net receivable from the counterparty.

For the most creditworthy counterparties (i.e., AAA-rated pension funds), TRS may be done on an unsecured basis or with just a mark-to-market agreement on the Swap. However, for most counterparties in this space, the firm has determined that they do not have recourse to a creditworthy counterparty; thus, the business requires 25%-50% in initial margin plus mark-to-market maintenance margin and these are risk managed by the market risk department.

Other structured products, such as Lehman’s portable alpha transaction, expose the firm to counterparty credit risk stemming from the use of TRS within the structure. The risk to Lehman is that the TRS could move in the money to Lehman (by the return on the index falling and/or LIBOR rising), creating counterparty credit risk to the fund with whom Lehman has signed ISDAs. Under this structure, FoF shares are pledged as collateral; however, these shares have varying degrees of liquidity which may make it difficult for Lehman to redeem shares in a timely manner. There is also the risk that the value of the collateral could decline. The correlation between the index and the fund shares is important, as simultaneous declines in the index and in the NAV of the funds could create uncollateralized counterparty credit exposure.

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<sup>21</sup> The interest rate exposure for these products is hedged on a portfolio basis along with the other interest rate products in Europe.

<sup>22</sup> The TRS in the portable alpha structure is used to provide the “beta” return (i.e., market return), and as such, the underlier is either an equity or fixed income index, not an illiquid hedge fund.

## **Operations, Legal, and Compliance Risk**

Operations risk is especially high for structured hedge fund products because of the need to frequently rebalance between portfolio components. This often means that firms have to build specialized applications to monitor these trades with systems and infrastructure flexible enough to facilitate capacity growth. Consequently, managing operations risk requires close coordination between risk managers, front and middle office personnel, product control personnel, and information technology.

Legal and compliance risks arise because of the complex nature of the legal structures that often involve multiple jurisdictions and legal entities, such as Special Purpose Vehicles (“SPVs”). Products such as PPNs use SPVs extensively. Since PPNs account for more than half of all the structured products issued by CSE firms,<sup>23</sup> this is an area that receives a great deal of attention.

At Morgan Stanley, the Cheyne transaction appears unique in that the firm is both prime broker and writer of the CPPI note on the managed hedge fund. Morgan Stanley’s multiple roles in this transaction have led to discussions at the firm and between the firm and OPSRA regarding the potential for conflicts to arise.

## **Hedging**

Hedging of structured fund products is conducted on a regular basis by some, but not all, of the CSE firms. Goldman hedges their FoF structured hedge fund exposure through an option based CFO structure where the payout is based on the percentage movement of a hedge fund index over a 3 month period. If, for example, the index declines by 20% over 3 months, the contract is exercisable at Goldman’s discretion. For a fall of 1998 stress test scenario, the FoF structured hedge fund business is hedged for instantaneous shocks greater than 25%. Goldman does not hedge exposure to structured products tied to single hedge fund shares because most of that exposure (i.e., gap risk) is born by external prime brokers.<sup>24</sup>

As previously mentioned, a common feature in CPPI structures is to have investment allocation mechanisms with fixed bond floors that do not vary with movements in interest rates. Lehman Brothers hedges this interest rate exposure with interest rate swaps, caps, and swaptions. Lehman also hedges gap risk by structuring gap options (i.e., cliquet puts) for clients, primarily insurance companies, seeking high yield investments. These are essentially put spreads where if a significant gap occurs, Lehman receives a payment. Lehman has issued approximately \$900 million of these cliquet-style put options that reset quarterly, and are 15%-25% out of the money. These products provide approximately \$100 million in gap risk protection for the firm.

Hedging is also done by Bear Stearns and Merrill Lynch for TRS products. As mentioned in the TRS section above, Bear Stearns and Merrill Lynch hedge their market risk exposure on

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<sup>23</sup> See Table 1 in the “Hedge Fund Derivative Products at the CSE Firms” section above for additional information on CSE firms’ portfolio composition.

<sup>24</sup> See “Goldman Sachs’ CPPI transaction on single hedge fund shares,” in the CPPI Notes section above, for additional information.

TRS by purchasing the underlying hedge fund or hedge fund index shares. This leaves the firms with counterparty credit risk exposure that is managed primarily by market risk managers.

## CAPITAL

### Capital Treatment

Three of the five CSE firms—Lehman Brothers, Bear Stearns, and Merrill Lynch—include structured hedge fund trades in the trading book and apply capital charges based on VaR plus a gap risk add-on. Because VaR does not generally capture extreme tail or stress events, the VaR capital charges tend to be negligible leaving the gap risk add-on as the primary means of calculating capital for structured funds at these three firms. The gap risk add-on results in moderate capital charges at Lehman and Bear and a comparatively large capital charge at Merrill Lynch.

Firm	Capital Treatment	Notional Balance	Capital Held	Capital / Notional
Lehman Brothers	Trading Book	\$5,180	\$132	3%
Bear Stearns	Trading Book	\$5,033	\$201	4%
Merrill Lynch	Basel I	\$1,628	\$186	11%
Goldman Sachs	Trading Book	\$1,554	\$4	0%
Morgan Stanley	* Trading Book	\$230	\$0	0%

\* MS believes that the proper treatment is banking book, but would like to continue using trading book for simplicity.

The remaining two firms—Morgan Stanley and Goldman Sachs—do not calculate a gap risk add-on capital charge; thus, they hold little to no capital on structured fund transactions. Currently, Morgan Stanley holds zero capital against these positions, but recognizes that zero is not the right number (especially if this business grows). The firm believes that capital for these products should be based on a banking book approach, but they would prefer to use trading book treatment for practical reasons. They also feel that certain types of trades (e.g., their \$165 million Cheyne trade) should receive preferential capital treatment due to better liquidity and visibility (which is made possible by a separate managed hedge fund account).<sup>25</sup>

Up until December year-end, Goldman Sachs applied a VaR market risk charge to their structured fund positions and a credit risk charge to the derivative hedges. Beginning in January 2006, the firm removed the positions from VaR because they felt that the coverage provided by their hedges, combined with the fact that VaR is not a good measure of crash risk, made VaR results immaterial in this product space. Goldman also believes that their CPPI structures are “unique” in that Goldman is able to shift most, if not all, of the gap risk to outside Prime Brokers.<sup>26</sup>

<sup>25</sup> See *Liquidity Risk* section above for additional detail.

<sup>26</sup> See “Goldman’s CPPI Transactions” in the CPPI section above for additional detail.

### Calculation Methodology

At Lehman Brothers, market risk capital charges on structured products are calculated using VaR plus a gap risk add-on. The gap risk add-on is generated from expected tail losses that measure the potential mark-to-market loss on positions due to gap risk in underlying hedge fund NAVs. These losses represent the distance below the bond floor when Lehman shocks the NAV on a trade-by-trade basis.

To calculate the loss, Lehman cuts the tail of the loss distribution at a 99.5% confidence level, and then uses the average of the tails for the gap risk add-on charge. The loss distribution, which is a function of the probability of price jumps and correlations, is built from over 500,000 Monte Carlo simulations where correlated jumps are applied to the underlying fund NAVs. The probabilities of the jumps are calibrated from the prices of traded gap options and out-of-the-money S&P puts. Correlations are based on historical analysis of underlying fund strategies' NAVs based on the Hedge Fund Research ("HFR") index.<sup>27</sup> At year end 2005, Lehman held \$132 million (or 2.55% of notional) in capital against \$5.2 billion in structured fund products. This equates to a risk weighting of 32%,<sup>28</sup> which falls between the 20% "AA" risk weighting and the 50% "A" risk weighting prescribed for corporate claims under Basel II.

With respect to counterparty credit risk, Lehman holds zero capital. The only structured fund product that generates counterparty credit risk is the portable alpha. As stated previously, the TRS within the portable alpha product is referenced to a standard equity or fixed income index, and as such, the firm uses the same counterparty credit risk model that it uses for all OTC derivative products. Since this model does not account for jumps and because the TRS is substantially over collateralized, the resulting capital charge is zero.

At Bear Stearns, structured fund products generally include a charge based on four time 10-day VaR plus an add-on for gap risk. The gap risk add-on is calculated based on a stress test derived from the firm's Equity Capital Model ("ECM") that is based on the worst return period for hedge funds (i.e., the 2<sup>nd</sup> half of 1998). The primary variable in the ECM is the "99% loss level," which is set for various basket sizes and forms the basis for the ECM base case trade. The base case trade generates a 5% add-on from a trade structure that approximates an "AA" to "A" risk profile. The 5% base case charge is applied to notional amounts, and equates to a risk weight of 62.5% (5% add-on divided by an 8% capital charge) versus 20% to 50% risk weight prescribed by Basel for "AA" to "A" rated risk. The base case trade uses the following characteristics: (1) quarterly liquidity; (2) day-1 customer equity equal to the 99% loss level (from the worst historical period (2<sup>nd</sup> half of 1998) plus 10% and (3) an unwind trigger at the 99% loss level (which gives the firm the right to break the trade at this level).

Bear Stearns uses the base case add-on of 5% as a starting point, and then adjusts the capital charge up or down for actual trades depending on how much the trade deviates from the base

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<sup>27</sup> Historical data includes the LTCM crises (i.e., the period of market dislocation that ensued in September and October of 1998).

<sup>28</sup> Since we know that capital held is \$132 million (or 2.55% of notional) and the capital charge is 8% of risk weighted assets; we calculated risk weighted assets by dividing the 2.55% by the 8% capital charge.

case assumptions. At year end 2005, Bear Stearns' add-on was approximately 4% resulting in a \$201 million gap risk add-on, which implies a risk weight of 50% ( $50\% \times 8\% = 4\%$ ). Most of Bear's structured funds trades are subject to gap risk, with the exception of the pass-through certificates that are fully funded at inception and the limited amount of total return swaps that are deemed to be on a secured basis with a creditworthy counterparty. The pass-through certificates capital charge is solely VaR based and the TRS recourse trades is VaR based plus counterparty credit risk charge. Both of these generate little capital.

At Merrill Lynch, the firm uses a Basel I type approach where they calculate risk-weighted asset values for specific risk and derivative counterparty risk, and then apply a 10% capital charge to the total risk-weighted amount. For specific risk, Merrill uses 100% risk weighting for all "on-balance sheet" structured fund products. It is important to note that Merrill's "on-balance sheet" amount is the NAV of the underlying hedge fund shares, not the notional balance of the structured products themselves. This appears reasonable given the high ratio of hedge fund NAV to notional balance. OPSRA suggested that going forward it might make more sense to use the greater of the notional balance on structured products or the NAV on hedges, although this may be a mute point given the fact that the firm holds a comparatively high level of capital compared to its peers.

The firm also calculates derivative counterparty risk, on hedges, per Regulation Y. At year end 2005, Merrill Lynch held \$186 million in capital against \$1.9 billion in notional for structured hedge fund products. The firm's capital add-on percentage is by far the most conservative capital charge for any of the CSE firms—10%. This equates to a risk weighting of 100% (based on the 10% capital charge being applied) but, for comparison purposes, would equal 125% risk weighting if based on the 8% capital charge used to compare the other firms.

## MEMORANDUM

October 3, 2006

TO: Chairman Cox  
Commissioner Atkins  
Commissioner Campos  
Commissioner Nazareth  
Commissioner Casey

FROM: Robert L.D. Colby, Acting Director  
Division of Market Regulation

RE: Residential and Commercial Mortgage Securitization – Cross Firm Project

Over a three month period earlier this year, Division staff conducted a series of discussions with business managers, risk managers, and regulatory controllers at CSE firms focused on residential and commercial mortgage securitization. The work was motivated by significant growth in these businesses, where, at year-end 2005, the size of securitization pipelines increased forty percent, for residential mortgages, and eighty-eight percent, for commercial mortgages, compared to the previous year-end. The aims of this project were several: First, the staff surveyed the various securitization products and their growth by various metrics over time. In addition, the staff reviewed how the risks associated with these products were measured, monitored and limited. Finally, the regulatory capital treatment of these products was compared across the five CSE firms.

### Residential Mortgage and Commercial Mortgage Securitization

Securitization is the process of aggregating similar assets, such as mortgage loans, into “pools” of loans and structuring those pools to create securities (e.g., Mortgage Backed Securities (“MBS”)) where the holder of the security has an interest in the cash flows that are generated by the underlying loans. CSE firms securitize various assets, but this project focused on two of the larger areas of securitization—Residential Mortgage Backed Securities (“RMBS”) and Commercial Mortgage Backed Securities (“CMBS”).

An RMBS is a security whose cash flows are derived from residential debt such as conventional mortgages, home-equity loans, and sub-prime mortgages as opposed to CMBS whose cash flows stem from loans secured by commercial real estate such as office buildings, multi-family apartments, and retail property. On both RMBS and CMBS transactions, principal and interest payments from underlying loans are passed through to certificate holders (i.e., investors), after deduction of servicing expenses. CMBS payment structures differ from RMBS in that they often contain bullet payment provisions (e.g., a ten-year balloon payment) with a 25 to 30 year amortization schedule where as the bulk of RMBS amortize over a 15 or 30 year period with no balloon payment.

The securitization process is comprised of loan origination or acquisition, loan accumulation, security structuring, and sale of securities. Each of these four sub-processes contains several intermediate steps. At a high level, loans are accumulated through three primary means—origination, conduit programs (e.g., through mortgage banks or mortgage brokers), or bulk purchase. Because mortgage securities often require a large number of underlying loans to generate the desired cash flows, firms typically go through an accumulation period of approximately three months. During the accumulation period, firms are exposed to movements in interest rates and changes in credit spreads that can affect the value of underlying loans and

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subsequent securities. Loans are generally accumulated, structured, and sold through a Special Purpose Vehicle (“SPV”), or trust, that is created to isolate the end investor from credit exposure to the securitizing firm (i.e., the CSE firm).

In recent years, CSE firms have added origination and servicing capabilities to their existing securitization operations in efforts to enhance their securitization business by becoming more vertically integrated. A primary goal of this vertical integration is to secure the supply of loan product for the securitization business. While most CSE firms obtain the vast majority of loan product through bulk purchases, origination channels are growing in size and importance. The growth has come from both the acquisition of mortgage originators and the growth of conduit operations where firms buy product from a multitude of smaller brokers on a loan-by-loan basis. In addition to increasing their origination efforts, many CSE firms now have servicing operations that provide them with steady sources of fee income and market intelligence (which ostensibly gives them a competitive advantage in pricing mortgage instruments). In the CMBS space, unlike the RMBS space, the CSE firms have historically been vertically integrated, originating most of the loans that are eventually securitized.

### Risk Management Issues

The primary risks facing these mortgage securitization businesses are interest rate risk (including prepayment risk) and credit spread risk. Interest rate risk is the risk that the value of an instrument will decline due to increases in interest rates. Credit spread risk is the risk that the spread over a reference rate will increase for an outstanding debt obligation, which will result in its price declining. This risk is typically driven by perceived credit deterioration by market participants. The degree to which each of these risks impacts the overall risk profile is dependent upon factors such as the loan type (i.e., are the loans residential or commercial) and the product mix (e.g., fixed rate versus variable rate, prime versus sub-prime, etc.). For prime and near-prime residential mortgages, the predominant risk factor is interest rate risk. For sub-prime residential mortgages and commercial mortgages, the dominant driver of risk is credit spreads. While firms monitor and track their sensitivities to interest rate and credit spread moves, a sudden shock to credit spreads is a risk that garners special attention from both the business unit and risk management. All the CSE firms, in varying degrees of formality, track the exposure their securitization pipelines have to a significant widening of credit spreads.

There are additional risks associated with residential mortgage securitizations that present unique risk management challenges. The first surrounds prepayment sensitivity for alternative mortgage products such as hybrid ARM and option ARM products. Unlike conventional 30-year mortgages that have been around for years, these instruments are relatively new resulting in limited prepayment data. Another risk that risk managers are keenly aware of is increased exposure to residual securities that firms are either unable to sell due to current market conditions, or are unwilling to sell at current market prices. While these exposures are generally mitigated through a “moving not storage” business strategy, we have seen increases in concentrated exposures to both.

Some recent trends in commercial mortgage securitization have also affected the risk profile of these businesses. First, there has been an increase in exposure to non-investment grade positions due to greater retention of mezzanine loans, which are subordinate to investment grade notes but senior to equity investments. Second, some firms have moved even further down the credit spectrum by making “bridge-equity” investments that are intended to be taken out by investors at a later date. Finally, there has been an increase in large “trophy” properties being securitized. The result of these trends has been an increase in the exposure to non-investment grade commercial real estate mortgages and an increase in concentration risk.

The business model across all the CSE firms’ mortgage securitization businesses is one of earning a spread rather than taking directional bets or relative value coupon plays and has been dubbed a “moving not storage” business. In this vein, much of the management of the risks

mentioned above surrounds making sure that mortgage instruments move through the securitization pipeline. Throughout the securitization process, there are both upfront risk management processes as well as on-going risk monitoring that takes place.

Capital Treatment

The calculation of capital charges for mortgage securitization businesses generally consists of value-at-risk based charges plus specific risk add-on charges (i.e. Regulation-Y add-ons). Some firms also classify certain lower or non-rated retained interests (e.g., residuals) as banking book positions. While a material amount of capital charges are derived from value-at-risk related charges, the largest portion comes from Regulation-Y add-on charges and/or charges on banking book positions.

We would be pleased to arrange a briefing to provide further details on this work or answer any questions.

cc: John W. White, Corporation Finance  
Linda Chatman Thomsen, Enforcement  
Andrew J. Donohue, Investment Management  
Lori A. Richards, Office of Compliance Inspections and Examinations  
Ethiopis Tafara, Office of International Affairs



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Residential and Commercial Mortgage Securitization  
Current Market Practice, Risk Management & Capital Treatment

OPSRA – Cross Firm Project

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Division of Market Regulation  
Office of Prudential Supervision and Risk Analysis  
100 F St., N.E.  
Washington, DC 20549

For Additional Information, Please Contact:

Jim Giles                      202.551.5536 [GilesJ@sec.gov](mailto:GilesJ@sec.gov)  
Kevin Silva                    202.551.5546 [SilvaK@sec.gov](mailto:SilvaK@sec.gov)

# TABLE OF CONTENT

## EXECUTIVE SUMMARY

Introduction .....	1
Key Findings .....	2

## MARKET OVERVIEW

Residential Mortgage Market Trends .....	6
Commercial Mortgage Market Trends .....	7

## SECURITIZATION PARTICIPANTS, BENEFITS & PROCESS

Securitization Participants .....	8
Benefits of Securitization .....	9
Securitization Process .....	9

## RMBS AND CMBS PIPELINES AT THE CSE FIRMS

Overview of Securitization Pipelines .....	14
RMBS – Interest Rate Sensitive (by firm) .....	15
RMBS – Credit Sensitive (by firm) .....	15
CMBS (by firm) .....	16

## RISK MANAGEMENT

Overview .....	16
RMBS .....	17
CMBS .....	18
The Evolution of Hedging .....	20

## CAPITAL

Overview .....	21
Regulation-Y Add-on Charges .....	21
Banking Book Charges (Residuals) .....	23

GLOSSARY .....	25
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# EXECUTIVE SUMMARY

## Introduction

Securitization is the process of aggregating similar assets, such as mortgage loans, into “pools” of loans and structuring those pools to create securities (e.g., Mortgage Backed Securities (“MBS”)) where the holder of the security has an interest in the cash flows generated by the underlying loans. CSE firms securitize various assets, but this report focuses on two of the larger areas of securitization—Residential Mortgage Backed Securities (“RMBS”) and Commercial Mortgage Backed Securities (“CMBS”).

An RMBS is a security whose cash flows are derived from residential debt such as conventional mortgages, home-equity loans, and sub-prime mortgages while CMBS are securities whose cash flows stem from loans secured by commercial real estate such as office buildings, multi-family apartments, and retail property.<sup>1</sup> Additionally, RMBS can be classified as agency RMBS securities that are issued by the Government Sponsored Entities (“GSEs”) Fannie Mae, Freddie Mac, and Ginnie Mae or non-agency RMBS, which are issued by private institutions (e.g., Countrywide). With both RMBS and CMBS structures, principal and interest payments from underlying loans are passed through to certificate holders (i.e., investors), after deduction of servicing expenses. CMBS payment structures differ from RMBS in that they often contain bullet payment provisions (e.g., a ten-year balloon payment) with a 25 to 30 year amortization schedule where as the bulk of RMBS amortize over a 15 or 30 year period with no balloon payment.

The securitization process is comprised of four sub-processes: (1) loan origination or acquisition, (2) loan accumulation, (3) security structuring, and (4) sale of securities. Each of these four sub-processes contains several intermediate steps that are discussed later in this report. At a high level, loans are accumulated through origination, through a conduit program, or through bulk purchase. Accumulation through origination occurs when the firm owns an origination facility from which loans are sourced and subsequently securitized. In conduit programs, the CSE firm receives a commitment from mortgage originators to deliver loans, with pre-determined underwriting characteristics, that are pooled together and held for securitization. Bulk purchase is simply purchasing a large pool of loans, typically through a bidding process. Because mortgage securities often require a large number of underlying loans to generate the desired cash flows, firms typically go through an accumulation period of approximately three months. During the accumulation period, firms are exposed to movements in interest rates and changes in credit spreads that can affect the value of underlying loans and the securities that are produced through their securitization. Loans are generally accumulated, structured, and sold through a Special Purpose Vehicle (“SPV”), or trust, that is created to isolate the end investor from credit exposure to the securitizing firm (i.e., the CSE firm).

This report begins with a summary of key findings and is followed by:

- An overview of RMBS and CMBS securitization markets
- A review of the securitization process and participants
- An analysis of RMBS and CMBS securitization pipelines at the CSE firms
- Inherent risks and risk management practices
- Capital treatment

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<sup>1</sup> See “Loan Types” in the Glossary of this document for definitions of the various residential loan types.

## Key Findings

### Business Overview

- **Overall size and dominant exposures** – The size of the overall non-agency residential and commercial mortgage securitization pipelines at the CSE firms has grown significantly over the past few years. Residential pipelines were at \$114 billion at year end 2005, which was 40% (or \$33 billion) larger than they were at year end 2004. Commercial mortgage pipelines were 88% (or \$23 billion) larger, finishing the 2005 year at \$49 billion. In recent years, the firms’ residential mortgage securitization businesses have been dominated by credit-sensitive sub-prime loans, with all CSE firms having a significant presence in this space. Additionally, a large portion of the firms’ non-agency prime securitization businesses have focused on adjustable rate mortgages (“ARMs”).
- **Geographic concentration** – The vast majority of residential securitization business is in the United States with a small portion in the UK where many CSE firms have started or acquired sub-prime originators over the past few years. On the commercial side, the exposures are still dominated by positions tied to United States properties; however, many firms have significant, and often lumpy, exposures in Europe and Asia. The individual commercial mortgage positions in Asia, in particular, tend to be large concentrated exposures. At year end 2004, 74% of the commercial mortgage exposure was in the U.S. with 22% in Europe and 4% in Asia. At year end 2005, exposure as a percentage of the total declined to 59% in the United States, increased slightly to 24% in Europe, and grew significantly to 13% in Asia.
- **Alternative mortgage products** – Over the past few years, alternative mortgage products rose in popularity as many borrowers focused more on the mortgage payment and less on the mortgage’s interest rate as interest rates and real estate prices rise. Many CSE firms originate or purchase a significant amount of these non-traditional loans, such as option-ARMs<sup>2</sup> and interest-only loans, for their residential securitization business. For example, option-ARMs recently accounted for roughly 25% of Bear Stearns’ ARM inventory. Most of these loans were purchased from mortgage banks and brokers, but more recently, Bear Stearns’ origination facility, Bear Stearns Residential Mortgage Corporation, began generating significant amounts of this product for securitization.
- **Vertical integration within RMBS** – In recent years, CSE firms have, to varying degrees, added origination and servicing capabilities to their existing securitization operations, in efforts to enhance their securitization business by becoming more vertically integrated. A primary goal of this vertical integration is to secure the supply of loan product for the securitization business. While most CSE firms obtain the vast majority of loan product through bulk purchases, origination channels are growing in size and

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<sup>2</sup> An option ARM is an adjustable rate mortgage loan typically with the option of four different monthly payment amounts: minimum payment, interest only, full principal and interest (30-year term) and full principal and interest (15-year term). These loans typically have a low initial fixed interest rate for a specified period of time. Beyond the fixed interest period, rates are subject to adjust monthly based on the specified index. Payment option amounts after the initial fixed interest period are subject to change annually. Deferred interest, or negative amortization, is possible with these loans.

importance. The growth has come from both the acquisition of mortgage originators (both within the U.S. and in the U.K.) and the growth of conduit operations where firms buy product from a multitude of smaller brokers on a loan-by-loan basis. In addition to increasing their origination efforts, many CSE firms now have servicing operations that provide them with steady sources of fee income and market intelligence (which ostensibly gives them a competitive advantage in pricing mortgage instruments). In the CMBS space, unlike the RMBS space, the CSE firms have historically been vertically integrated, originating most of the loans that are eventually securitized.

- **Noteworthy firm specific items:** Above, we highlighted common residential and commercial mortgage business themes for the CSE firms. However, there are a number of noteworthy firm specific items:
  1. Bear Stearns and Lehman Brothers have the largest residential mortgage franchises and are the most vertically integrated.
  2. While all the CSE firms have significant exposures to sub-prime borrowers, Bear Stearns has a dominant market-share with respect to the securitization of ARMs.
  3. Bear Stearns and Lehman Brothers continue to have substantial option-ARM positions in their pipelines. While the majority is securitized and sold, Bear Stearns has, from time-to-time, held concentrated prepayment sensitive tranches of securities based on this collateral type. Many of these positions come from making markets in Bear Stearns deals for clients.
  4. Lehman has the largest and most seasoned residential mortgage origination operation across its CSE peers.
  5. In the commercial mortgage securitization business, Morgan Stanley is by far the dominant player among its CSE peers.
  6. Morgan's CMBS business is the most geographically diverse with large Asian and European businesses to complement its U.S. based business.

### Risk Management

- **The major market risks facing the mortgage securitization businesses are interest rate risk (including prepayment risk) and credit spread risk.** Which risk factor is most dominant depends on the product type and borrower characteristics. For prime and near-prime residential mortgages, the predominant risk factor is interest rate risk. For sub-prime residential mortgages and commercial mortgages, the dominant driver of risk is credit spreads. While firms monitor and track their sensitivities to interest rate and credit spread moves, a sudden shock to credit spreads is a risk that garners special attention from both the business and risk management. Because securitization businesses naturally run a long credit spread profile, all the CSE firms, in varying degrees of formality, track the exposure of their securitization pipelines to a significant widening of credit spreads.
- **Additional risks associated with residential mortgage securitizations** – In addition to the overall large long credit spread positions, there are several specific market risks on the residential mortgage side that present unique risk management challenges including: (1) prepayment sensitivity for alternative mortgage products and (2) residual tranches of RMBS securities. While these exposures are generally mitigated through a “moving not

storage” business strategy, we have periodically seen concentrated exposures in both areas.

- **Commercial mortgage trends affecting the businesses’ risk profiles** – Recent trends surrounding CMBS pipelines have complicated the risk management of these activities. First, there has been increased exposure to non-investment grade positions due to greater retention of mezzanine loans and/or B-notes by some firms. Second, some firms have moved down the credit spectrum by making bridge equity investments. Finally, there has been an increase in large “trophy” properties being securitized resulting in an increase in concentration risk.
- **CSE firms are in the “moving not storage” business** – The business model across all the CSE firms’ mortgage securitization businesses is one of earning a spread rather than taking directional bets or relative value coupon plays and has been dubbed a “moving not storage” business. In this vein, much of the management of the risks mentioned above entails making sure that mortgage instruments move through the securitization pipeline steadily.
- **The evolution of hedging options** – While mortgage securitization businesses have traditionally had a variety of instruments available to hedge interest rate risk, there have been few options for effectively hedging credit spread risk. As a result, both residential and commercial mortgage pipelines at the CSE firms were running up against certain market risk limits, such as credit spread widening scenario limits. However, with the advent of new mortgage derivative instruments, CSE firms have been able to substantially grow their pipelines while mitigating the risk of a systemic shock to credit spreads.
- **New risks** – The advent of derivatives on Asset Backed Securities (“ABS”) has not only helped provide the businesses with the opportunity to hedge the considerable credit spread risk generated from these pipelines, but has also created additional trading opportunities that require risk management’s attention. These synthetic positions have introduced new risks (e.g., cash/CDS basis risk and correlation risk), which are difficult to monitor and manage, and have not traditionally been associated with RMBS and CMBS securitization.
- **Additional Risks** – While the major risks in RMBS and CMBS securitization businesses are interest rate risk and credit spread risk, other risks worth mentioning are counterparty credit risk and legal and operational risk. Counterparty credit risk stems from exposure to originators regarding representations and warranties and put-back rights for bad loans. Some of the smaller, new entrants into sub-prime origination have failed or have had disputes in settling transactions with CSE firms in recent months as rates have risen and origination has slowed. As firms become more vertically integrated—adding both origination and servicing components that generally focus on sub-prime and alt-A borrowers<sup>3</sup>—legal and operational risks increase as well.

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<sup>3</sup> Alt-A borrowers generally have credit scores that meet Fannie Mae or Freddie Mac underwriting standards, but are unable to qualify as “prime” borrowers for documentation or other reasons. For instance, they may be unable or unwilling to provide income verification or they may be applying for loans with high LTV ratios. Therefore, credit decisions are more reliant upon the borrowers’ credit scores and the adequacy of the underlying collateral.

## Capital

- The calculation of capital charges for the mortgage securitization businesses at the CSE firms varies but generally consists of a combination of VaR based charges plus standard specific risk add-on charges (i.e. Reg-Y add-ons). In addition, two firms (Bear Stearns and Lehman Brothers) have classified certain lower or non-rated retained interests (e.g., residuals) as banking book positions. The charges on the banking book positions represent a significant portion of the capital charges for the securitization business of these two firms.
- Unlike the other product areas, namely event-driven lending and hedge fund derivative products,<sup>4</sup> for which we did a cross-firm analysis, the mortgage securitization businesses do generate a material amount of their capital charges from the VaR related charge. However, overall, a majority of the capital held against these businesses still comes from both Reg-Y add-on charges and/or positions classified as banking book.
- While all CSE firms take some form of add-on charges for these businesses, the application of these charges is not uniform. The scope of positions subject to add-on charges or held in the banking book vary firm-to-firm. Some firms take Reg-Y specific risk add-ons on both non-investment grade securities and a portion of the loans awaiting securitization, whereas others take charges solely on the non-investment grade securities. In addition, the capital treatment may differ for the residential and commercial mortgage businesses. For example, one firm, Goldman Sachs, takes no specific-risk charges on its residential mortgage business while taking specific risk charges on virtually all of its commercial whole loans and non-investment grade CMBS tranches.

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<sup>4</sup> “Event Driven Lending Current Market Practice, Risk Management & Capital Treatment,” 4/24/2006; “Hedge Fund Derivative-Linked Products Current Market Practice, Risk Management & Capital Treatment,” 6/26/2006.



## MARKET OVERVIEW

### Residential and Commercial Mortgage Market Trends

Since 1995, industry wide RMBS issuance has grown at a 99% compound annual growth rate<sup>5</sup> (“CAGR”) from \$53 billion in 1995 to more than \$1 trillion in 2005.<sup>6</sup> While not growing as dramatically as RMBS, CMBS issuance increased significantly—at 30% CAGR—from \$17 billion in 1995 to nearly \$239 billion by year-end 2005.<sup>7</sup> In recent years, growth in RMBS issuance has been primarily driven by increased demand for adjustable rate products and significant increases in sub-prime and alt-A originations while CMBS issuance has been characterized by significant growth in the U.S. and dramatic growth in Europe and Asia. Significant market trends experienced over the past decade include:

#### Residential Mortgage Trends

- Adjustable rate RMBS issuances have increased dramatically compared to fixed rate issuances – By year-end 2005, approximately half (or \$515 billion) of all RMBS issuances were adjustable rate, up from 39% (or \$299 billion) in 2004. This is a significant increase from 11% (or \$59 billion) in 2001.
- Sub-prime originations (including ARMs) have skyrocketed – Sub-prime originations increased to \$625 billion in 2005 from \$210 billion in 2001. Currently, more than 1 in 10 mortgage holders is a sub-prime borrower.<sup>8</sup>
- Traditional “prime” versus “sub-prime” risk buckets are becoming less distinct – Historically, the distinction between prime and sub-prime borrowers was made primarily using borrowers’ FICO scores. Increasingly, however, the riskiness in underlying prime mortgages is coming more from leverage and less from prepayment risk. While this has always been the case for traditional sub-prime borrowers, the increased demand for teaser rate loans (e.g., interest only, ARMs, etc.) and second liens has some risk managers more concerned with “idiosyncratic” credit risk than with prepayment risk for prime borrowers as well.<sup>9</sup>
- Home equity levels for ARM products have declined significantly – In 2004, 11.4% of ARMs were originated with negative home equity. This value increased dramatically to 32.3% in 2005. Comparatively, less than 8% of ARMs were originated with negative equity for any given year between 2000 and 2003.<sup>10</sup> Additionally, if home values decline by 10%, more than half of the ARMs originated in 2005 will experience negative equity. This is the result of many adjustable-rate mortgage borrowers stretching their financial abilities to acquire homes with small down payments and low monthly payments.

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<sup>5</sup>  $CAGR = (Ending\ Value / Beginning\ Value)^{(1 / \#\ of\ years)} - 1$

<sup>6</sup> Bloomberg, ICMO function

<sup>7</sup> “Commercial Mortgage Alert,” www.CMAlert.com

<sup>8</sup> “The State of the Nation’s Housing” report, Harvard University’s Joint Center for Housing Studies, June 13, 2006.

<sup>9</sup> Sherr, David, Global Head of Mortgage Trading/Structured Finance at Lehman.

<sup>10</sup> Cagen, Christopher L., Ph.D., “Mortgage Payment Research. The Rumor and the Reality,” First American Real Estate Solutions, February 8, 2006.

- Large commercial bank originators are increasingly self-securitizing – Large commercial banks such as Countrywide Financial and Wells Fargo are increasingly self-securitizing, which makes these institutions less reliant on investment banks for residential mortgage securitizations. This trend has led some CSE firms to pursue “vertical” business models that include origination platforms.

### Commercial Mortgage Trends

- Securitization of commercial real estate has increased dramatically – Commercial real estate securitization (i.e., CMBS issuance) increased 87% in 2005 to \$238.9 billion globally. In 2003 and 2004, CMBS annual issuances were up 22% and 30%, respectively, over the prior year.<sup>11</sup>
- Annual increases in CMBS issuance have been driven by significant growth in the U.S. combined with dramatic growth outside the U.S. Over the last decade, CMBS issuances in the U.S. have increased at a constant annual growth rate of 27% from \$15.7 billion in 1995 to \$169.2 billion in 2005. Outside the U.S., CMBS issuances grew at 52% CAGR from \$1.1 billion in 1995 to \$69.7 billion in 2005.
- Commercial banks and thrifts dominate the CMBS issuance market in the U.S. – Commercial banks and thrifts issued 63.3% (or \$103.5 billion) of all CMBS backed by U.S. conduit loans in 2005 and 60.7% (or \$55.1 billion) in 2004. Comparatively, investment banks issued 26.1% (or \$42.7 billion) in 2005 and 29.1% (or \$26.4 billion) in 2004.
- “Fusion” deals are the most prevalent CMBS deal types – Fusion deals, which involve the combining of conduit loans that would have previously been disaggregated into separate securities, accounted for more than 80% of CMBS issuances in 2005 and approximately 75% of issuances in 2004. These deals have become increasingly popular as underwriters attempt to improve the diversification of CMBS pools.
- Liquidity of CMBS has improved dramatically – There has been an influx of investors in this space. A large portion of the influx is due to improvements in available information and changes in regulations (e.g., regulations that now allow insurance companies to hold CMBS).<sup>12</sup>
- Bid/ask spreads on CMBS in the secondary market are extremely tight. As a result, CSE firms tend to focus less on market making and more on the deal pipeline.

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<sup>11</sup> “ Commercial Mortgage Alert,” [www.CMAAlert.com](http://www.CMAAlert.com)

<sup>12</sup> Sherr, David, Global Head of Mortgage Trading/Structured Finance at Lehman.

# SECURITIZATION PARTICIPANTS, BENEFITS & PROCESS

## Securitization Participants

Main participants in U.S. securitizations include loan sellers or originators, agents of the securitization trust, rating agencies, and “certificate” investors.

*Loan sellers and originators* sell (or deposit) loans into a “trust,” which is set up by the securitization underwriter. The loan seller/originator also provides representations and warranties that provide recourse (e.g., put back rights) if loans within the pool do not conform to advertised standards or anticipated performance.<sup>13</sup> After receipt of the loans, the trust sends the loan information to *rating agencies* that evaluate the collateral quality and determine subordination levels required to achieve certain bond ratings. Responsibility for coordinating and overseeing these, and other, functions falls upon “agents” of the trust.

A trust generally employs four types of *agents*—a trustee, a master servicer, a primary servicer, and a special servicer—that provide trust oversight and loan servicing in accordance with a pooling and servicing agreement.<sup>14</sup> The *trustee* serves as the fiduciary of the trust and is responsible for trust governance, which covers all agents of the trust. The trustee is primarily concerned with preserving the rights of the investor. For CMBS transactions, the trustee is also responsible for “bond administration” functions such as principal and interest distributions to bondholders, and bond and collateral reporting via report packages (i.e., investor and tax reporting). For RMBS deals, bond administrator functions are often performed by the trustee, but can also be delegated to a separate bond administrator.

Master servicers are responsible for:

- Oversight of primary servicers, with respect to the primary servicer's responsibilities.
- Reporting to the trustee.
- Providing liquidity by advancing principal and interest, as well as certain property protection expenses, on delinquent loans. If the transaction requires a special servicer, the master servicer will insure the smooth transfer from the primary servicer to the special servicer and monitor the ultimate disposition of problem loans.

Primary servicers' responsibilities typically include:

- Collecting monthly principal, interest, and escrow payments from individual mortgagors.
- Remitting and reporting to the master servicer.
- Monitoring delinquent and problem loans (which may be handled directly by the special servicer).

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<sup>13</sup> Reps and warranties are contained in Master Loan Purchase Agreements that sellers sign. Claims can be either repurchase claims, where the seller must buy back the loan, or monetary claims, where the seller is required to remit cash. Typical repurchase claims include Early Payment Default (“EPD”), which provides protection against delinquency in early months (typically within the first 3 months), and breached representations and warranties (e.g., improper income verification). Two common monetary claims include prepayment premium recapture (typically 3 months) and remittance reconciliations (e.g., true ups for payments that were made, but sent to the wrong location due to the sale of a loan).

<sup>14</sup> A pooling and servicing agreement (“PSA”) is a written agreement between a lender depositing loans to a trust, the trust, and the loan servicer. The PSA outlines the obligations of the various parties with respect to the securitized loans and usually includes some guidance with respect to the defeasance of the loans.

For commercial loans, primary servicers are also responsible for performing property inspections and collecting and analyzing property financial statements. In the absence of a master servicer, the primary servicer is responsible for the reporting and remitting of funds directly to the trustee and advancing principal and interest payments on delinquent loans. If there is no special servicer, the primary servicer handles the work-out of sub-performing and delinquent loans.

Special servicers are responsible for maximizing recoveries on nonperforming loans and Real Estate Owned (“REO”) assets, and are essential to maintaining the credit quality of a pool containing nonperforming loans and REO assets. The specific arrangement varies from one transaction to another. Typically, the loans are transferred to the special servicer at some pre-determined point based on delinquency and/or other performance measures. Currently, in residential transactions, the use of a designated special servicer is not as common as in commercial products, but the practice is becoming more widespread, particularly in loan products that are expected to have high delinquencies and therefore losses.<sup>15</sup>

### Benefits of Securitization

In addition to the obvious benefit of fee generated revenue enjoyed by underwriters, servicers, and rating agencies, securitization also provides benefits to originators and investors.<sup>16</sup> For originators, securitization can improve return on capital by converting an on-balance-sheet lending business into an off-balance-sheet fee income stream that is less capital intensive. Depending on the type of structure used, securitization may also lower borrowing costs, release additional capital for expansion or reinvestment, and improve risk management.

For investors, securitized assets offer a combination of attractive yields (compared with other instruments of similar quality), increase secondary market liquidity, and generally provide more protection by way of collateral overage and/or guarantees by entities with high and stable credit ratings. Securitized assets also offer flexibility because their cash flows can be structured to meet investors’ particular requirements. Additionally, structural credit enhancements and diversified asset pools free investors of the need to obtain a detailed understanding of the underlying loans.

### Securitization Process

Residential and commercial mortgage securitization is comprised of four sub-processes: (1) loan origination or acquisition, (2) loan accumulation, (3) security structuring, and (4) sale of securities. At the onset of the securitization process, the security underwriter sets up a trust (i.e., special purpose vehicle (“SPV”)) that serves as the legal entity responsible for the various securitization functions and cash distributions.

**For residential mortgages**, the SPV either purchases loans from an outside seller in bulk or through a loan conduit, or from a vertically integrated “retail” origination facility (as well as from outside sellers). Some firms, such as Goldman Sachs, Merrill Lynch, and Morgan Stanley, have historically purchased loans primarily through bulk purchases in which the loan sellers aggregate loans and put out packages to bid on.<sup>17</sup> Other firms (i.e., Lehman Brothers and Bear

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<sup>15</sup> Source: Fitch Corporate, [www.fitchratings.com](http://www.fitchratings.com)

<sup>16</sup> Comptroller of the Currency, “Asset Securitization; Comptroller’s Handbook,” November 1997.

<sup>17</sup> Merrill Lynch has a fairly large sub-prime origination platform in the UK (that generated approximately \$63 million in revenue on \$2.8 billion in origination and servicing assets), but limited origination in the US.

Stearns) have large origination facilities and conduit loan programs that are used in conjunction with bulk purchases.

Bear Stearns began originating loans through *Bear Stearns Residential Mortgage* in April of 2005. As of April 2006, Bear originated \$1.5 billion in loans through this platform; and is projecting \$5.0 billion in originations for 2006 and \$11 billion in 2007. While Bear Stearns' origination program is growing rapidly, its conduit program<sup>18</sup> currently provides a much larger source of loan product for securitization, particularly in the alt-A and sub-prime space.

Among its CSE peers, Lehman Brothers has the largest origination facility at \$51.9 billion in origination volume for 2005. While Lehman Brothers has had an origination facility for a number of years, other CSE firms such as Morgan Stanley and Merrill Lynch have recently purchased mortgage origination facilities. On August 10, 2006, Morgan Stanley announced that it will purchase Saxon Capital, a sub-prime residential mortgage lender. Merrill Lynch, on September 5, 2006, announced that it will purchase three mortgage businesses—First Franklin, Home Loan Services, and NationPoint. First Franklin is a wholesale originator of non-prime residential mortgage loans, Home Loan Services is a mortgage servicing company, and NationPoint is an online retail residential mortgage lender. In addition to the vertical integration experienced in the U.S. market, several of the CSE firms have purchased sub-prime originators outside the U.S., particularly in the U.K.

Loan Acquisition and Accumulation									Securitization and Sale					
Time (Days)	Receive bid tape	Bid submitted / won		Receive initial pool listing from seller	Perform due diligence and negotiate contracts / Send initial pool to rating agencies			Confirm diligence kickouts / finalize pool	Settle date / funding	Begin structuring process	Finalize structure	Price securitization	Settle securitization / sell residual	
	0	7	14	21	28	35	42	49	56	60	67	74	81	90
	Put on hedges									Loans go on balance sheet				Loans go off balance sheet / Remove hedges

Following loan origination/acquisition, loans are accumulated in the SPV for approximately 60 days until the pool of loans reaches a desired size after which point they are structured into various securities, which generally takes 2 to 3 weeks, and then are priced and sold. In total, the entire residential securitization process takes approximately 90 days to complete (as depicted in the table above).

For bulk purchases from sellers, the acquisition and accumulation phase consists of several steps that precede the securitization and sale of the pooled loans.

- Receipt of bid tape – On day one, CSE firms receive a bid tape from the seller that contains preliminary data on loan pools. The seller typically also sends a request to settle in 60 days. At this point some investment banks put on hedges to mitigate the risk that changes in interest rates will impact the value of the loans that they are bidding on.

<sup>18</sup> Through conduit programs, CSE firms purchase newly originated closed loans from mortgage banks and/or mortgage brokers through bulk and flow channels.

- Bid submitted – After approximately one week of reviewing the bid tapes, the investment bank submits a bid for the pool of loans.
- Receipt of initial pool listing from seller – If the investment bank wins the bid for the loans, the seller will send an initial pool listing. This pool listing is much more specific providing loan-by-loan detail for the mortgage pool. The initial pool listing is generally received by the investment bank approximately 3 weeks after the bid is won (which is 28 days into the total process).
- Due diligence, negotiation, and rating – Over the next 28 to 30 days, the investment bank performs due diligence on the pool listing, negotiates contracts with the seller, and sends the initial pool to rating agencies. The collateral term sheets and structural term sheets are written and approved by the seller, the depositor, underwriter and rating agencies, then distributed to investors for feedback on potential deal structure and pricing.
- Confirm and finalize – Upon completion of due diligence and receipt of pool rating, the investment bank notifies the seller of any loan kick outs, which are returned to the seller (typically for credit toward future purchases) and the loan pool is finalized. For example, loans may not meet underwriting standards or they may not meet performance requirements such as early payment default by the borrower.
- Settlement and funding – Following pool finalization, the investment bank settles with the seller at which time funding occurs. This generally occurs on the 60<sup>th</sup> day (as initially requested by the seller) at which time the loans are placed on the investment bank’s balance sheet.

Following settlement and funding for the pool of loans, the process enters the structuring phase of securitization. By structuring loans into securities, investment banks are able to split credit risk into several tranches, placing the risk with parties that are willing or best able to absorb the risk. A simple example of tranching securities is to separate the loans’ cash flows into three tranches—a first loss tranche, a second loss tranche, and a senior tranche. The first loss tranche is usually capped at levels approximate to the “expected” level of portfolio credit losses. For example, if the pool of residential mortgages is expected to have losses equivalent to 3 percent of the total cash flows, then the first loss tranche would be capped at that level. The second loss tranche covers losses in excess of the first loss tranche, but is generally capped at some multiple of the pool’s expected losses (typically 3 to 5 times). Because of subordination, the senior tranche generally has little exposure to credit risk, but may be exposed to other risks such as interest rate risk and prepayment risk.

The structuring of cash flows into various tranches is done utilizing subordination and other credit enhancement methods, which can be provided either through external guarantees (i.e., third-party or seller guarantees) or internally through structural or cash flow driven methods. Aside from coupon payments to investors, the cost of credit enhancement is usually the largest securitization expense with external credit enhancement typically costing more than internal enhancement. The type and size of credit enhancement are negotiated with rating agencies, and are dictated by the desired credit rating. For CSE sponsored deals, subordination and other internal credit enhancements are the primary tools used to achieve the desired credit ratings for RMBS tranches.

The three most common types of *external credit enhancement* are third-party letters of credit (“LOCs”), surety bonds, or limited guarantees by the seller to cover a certain percentage of cash flow shortfalls. Third-party LOCs are generally utilized by issuers with credit ratings below the level sought on the security. Similar to a seller guarantee, an LOC covers a certain amount of loss, or percentage of losses, and any draws on the LOC are often repaid by excess

cash flows (if available). Surety bonds are guarantees issued by third parties, usually AAA rated mono-line insurance companies, that guarantee (or wrap) 100 percent of the principal and interest payments.

*Internal credit enhancements* include the use of excess spread, spread accounts, cash collateral accounts, collateral investment amount (“CIA”), and subordinate security classes.

- Excess Spread – Portfolio yield on a pool of assets is generally greater than fees and expected losses. This excess spread or “residual” amount (if available) can be used by the trust to cover unexpected losses. Any unused residual may revert to the seller as additional profit or may be retained by the investment bank or other external investors.
- Spread Account – A spread account involves using monthly finance charges from the underlying pool of assets to cover unexpected losses.
- Cash Collateral Account – A cash collateral account is a segregated trust account that can be drawn on to cover principal or interest shortfalls if excess spread is reduced to zero. The cash collateral account can be funded by the issuer, but is usually funded with a third-party loan that is repaid only after all certificate holders are repaid in full.
- Collateral Investment Amount (“CIA”) – A CIA is an uncertified, privately placed, ownership interest in the trust that is subordinate in payment rights to all investor certificates. CIAs serve the same purpose as cash collateral accounts—they make up for shortfalls if excess spread is negative.
- Subordinate Security Classes – Subordinate classes are junior in claim to senior debt. Additionally, securities often contain more than one class of subordinate debt, and one subordinate class may have a higher claim than others.

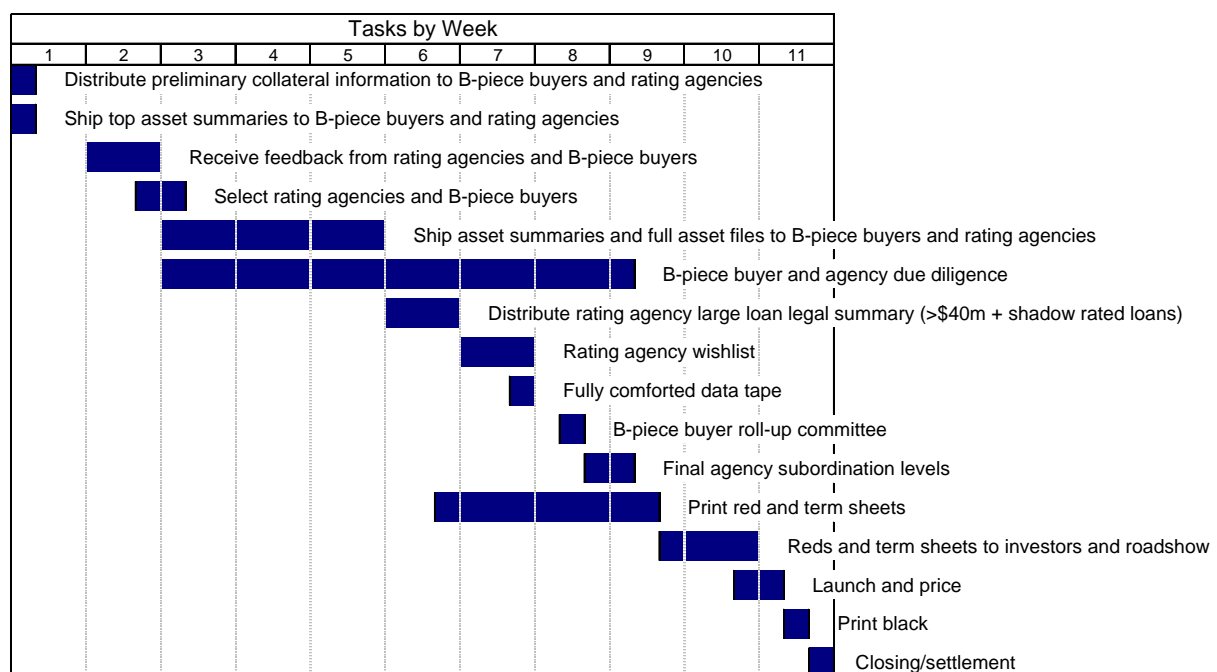
Two key documents for this portion of the securitization process include the Prospectus and the Pooling and Servicing Agreement (“PSA”). The Prospectus is drafted and reviewed by all parties to the transaction including the seller, depositor, underwriter, master servicer, servicers, trustee, and rating agencies. The PSA is drafted based on the final structure described in the Prospectus, and also incorporates rating agency requirements and the general industry standards for a transaction. Once the Prospectus is finalized, it is distributed to investors prior to the closing or settlement date. The PSA (along with any additional servicing agreements) are finalized and approved by all applicable parties (i.e., the seller, depositor, underwriter, servicers, trustee, and rating agencies). Following the distribution of the Prospectus to investors and finalization of the PSA, the pool of loans are offered as securities to the market and documents are filed with the Commission.

***For commercial mortgage securitizations*** in the United States, investment banks generally originate and securitize commercial mortgage loans versus syndicating the loans directly to investors. In Europe and Asia, some CSE firms syndicate a portion of commercial loans in whole loan form. Even though whole loan syndication is not common practice in the US, many of the CSE firms pointed out that they do frequently combine their commercial loans with loans from other institutions in “fusion” deals, where the intent is to diversify across property types, or to achieve a desired securitization deal size.

Another important distinction between RMBS and CMBS transactions is the amount of upfront effort, in CMBS deals, that goes into structuring subordinate bonds rated BB+ and below. This includes distributing preliminary collateral information to “B-piece buyers” and rating agencies, and receiving feedback prior to final selection of the rating agencies and B-piece

buyers. CSE firms stated that this is the case because, unlike RMBS, the intent is to immediately sell all CMBS bonds created during the securitization process. Practices are similar in the U.S. and Europe with the exception that European CMBS are not usually tranching below BB because the market is not very well developed.

As depicted in the table below, the first few weeks are dedicated to ensuring that B-piece buyers and rating agencies are fully informed on the deal and have an opportunity to provide input. By being in early contact with B-piece buyers and rating agencies, the investment banks hope to (1) assess the level of demand for the deal (especially the non-investment grade pieces of the deal), (2) determine what, if any, additional structuring is required to make the deal successful (e.g., combining the loan with other commercial loans to provide greater diversification), and (3) get an idea about how the rating agencies feel about the deal (e.g., what the proper subordination levels might be).



Once rating agencies and B-piece buyers are selected and due diligence is done, the “red” prospectus (draft copy) is written and approved by the depositor, issuers/underwriters, master servicer, special servicer, trustee, and rating agencies. The red prospectus and term sheets are distributed to investors after which the issuer/underwriter finalizes the pool of assets, prices the deal, and prints and distributes the “black” prospectus (final) to the investors.

While the CMBS structure is being marketed to investors, details on how the deal will be governed are also being negotiated:

- The Pooling and Servicing Agreement (PSA) is drafted based on the special servicer provisions, trustee provisions, rating agency requirements, master servicer bid letter terms and the general industry standards for a CMBS transaction.
- PSA is finalized by agreement of the named parties in the document.
- The master servicer completes negotiations with each individual primary servicer and finalizes the Primary Servicing Agreements
- The depositor offers the pooled assets as securities to the market and files the official documents to complete the transaction with the Commission.

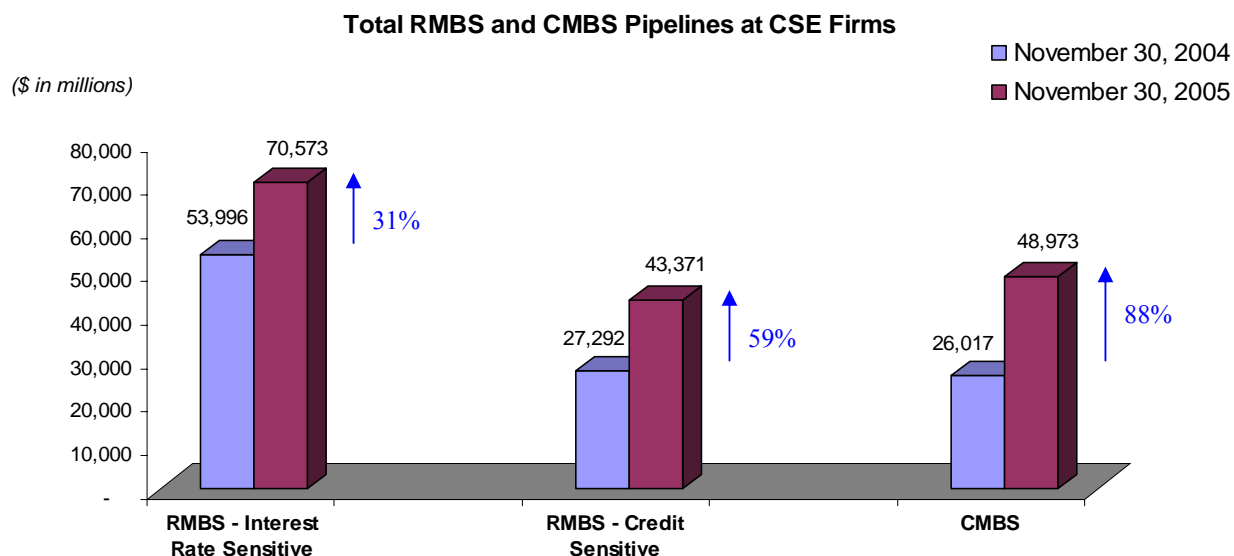


## RMBS AND CMBS PIPELINES AT THE CSE FIRMS

When analyzing data from the CSE firms, we looked at CMBS and RMBS securitizations separately, and then segregated RMBS further into interest rate sensitive instruments and credit sensitive instruments.<sup>19</sup> Additionally, the data included residential and commercial whole loans that are in the pipeline awaiting securitization as well as RMBS and CMBS residuals. Data were aggregated as follows:

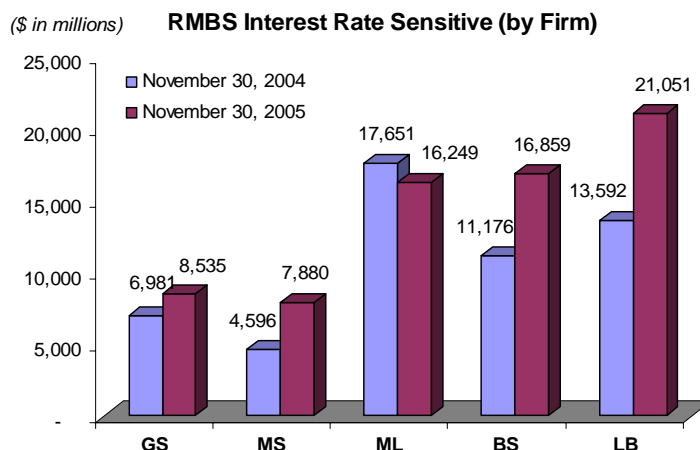
Residential Mortgage Loans and Securities		
Interest Rate Sensitive	Credit Sensitive	Commercial
Loans	Loans	Whole Loans (US)
Prime fixed rate loans	Sub-prime	Whole Loans (Europe and Asia)
Prime hybrid ARM loans	Non-performing	Securities
Alt-A	Scratch and Dent	
FHA/VA loans		
Securities	Securities	
Agency CMO	Sub-prime	
Prime fixed rate securities	Non-performing	
Prime hybrid ARM securities		
Alt-A		
FHA/VA securities		
REMIC residuals		

The graph below shows that RMBS Credit Sensitive and CMBS pipelines increased significantly, on a percentage basis, from year-end 2004 to year-end 2005 while RMBS Interest Rate Sensitive increased modestly. This is similar to the increases encountered in the overall RMBS and CMBS markets. CMBS holdings at the CSE firms increased by 88% from \$26 billion to \$49 billion, RMBS credit sensitive loan volumes were up 59% to \$43 billion, and RMBS Prime was up 31% to \$71 billion.

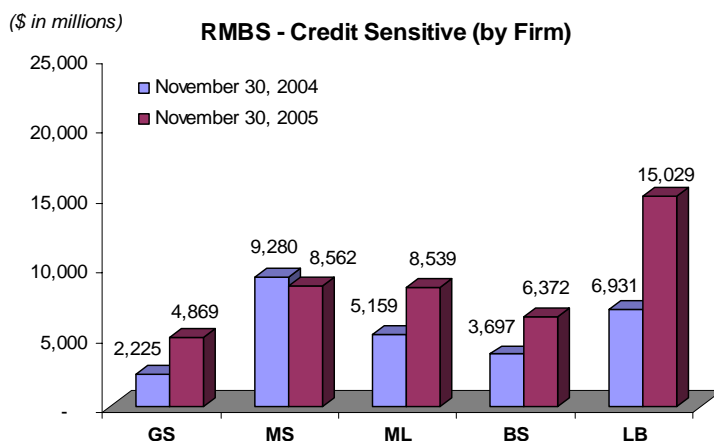


<sup>19</sup> Interest rate sensitive instruments are primarily exposed to the risk that the value of an instrument will decline due to increases in interest rates. Credit sensitive instruments are primarily exposed to credit spread risk, which is the risk that the spread over a reference rate will increase for an outstanding debt obligation.

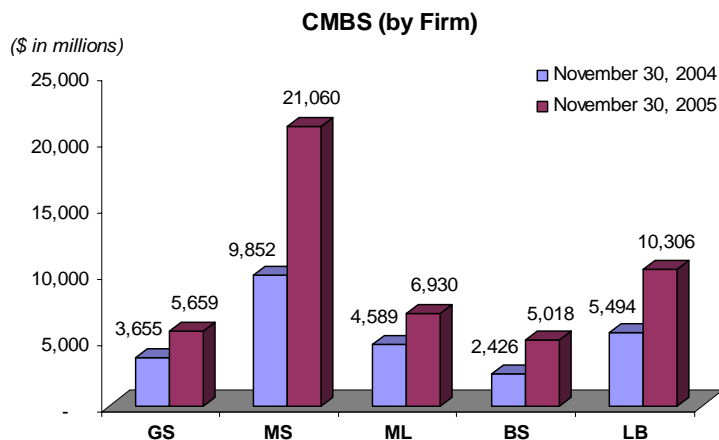
The increase in RMBS Interest Rate sensitive instruments was primarily a function of significant increases in hybrid and option ARM products. Lehman's and Bears' volumes increased substantially combined with smaller increases at Morgan Stanley and Goldman Sachs. These increases were partially offset by a decline in volume at Merrill Lynch. Lehman's increase was driven primarily by an increase in option ARM products, which increased from virtually zero in the 4<sup>th</sup> quarter of 2004 to \$5.2 billion in the 4<sup>th</sup> quarter of 2005. Approximately 90% of the option ARM products were to Alt-A quality borrowers. Bear Stearns' increase was driven by an increase in ARMs and Alt-A loans. Similar to Bear Stearns, Morgan Stanley experienced significant growth in residential ARM products. Merrill Lynch, who as of November 30, 2004 had the largest RMBS rate sensitive pipeline, has traditionally underwritten variable rate securities tied to one or six month LIBOR. In recent years, Merrill began issuing mainly 3/1 and 5/1 hybrid ARMs that have fixed interest rates for a specified amount of time (3-years for a 3/1 and 5-years for a 5/1) after which time they become adjustable rate instruments with annual resets. This is consistent with what has occurred in the residential mortgage market as a whole.



CSE firms' RMBS Credit sensitive pipelines increased for all firms with the exception of Morgan Stanley. The largest increase occurred at Lehman Brothers where the primary driver was non-prime loans (which consists of sub-prime, scratch and dent, and sub-prime second liens) that increased by \$8.1 billion from November 30, 2004 to November 30, 2005. At Bear, the primary driver was sub-prime loans that increased from \$2.8 billion to \$4.5 billion on the same dates. Goldman Sachs and Merrill Lynch experienced growth in sub-prime loans of \$2.3 billion and \$3.4 billion respectively. Although Morgan Stanley's RMBS credit sensitive pipeline declined slightly at year-end 2005 (compared to year-end 2004), the volume remained relatively high.



The *CMBS* graph to the right shows that Morgan Stanley was, by far, the largest contributor to growth in *CMBS* volumes across CSE firms. Morgan Stanley's *CMBS* pipeline increased significantly to \$21.1 billion on November 30, 2005 due to dramatic growth in Asia and Europe and significant growth in the United States. Morgan's *CMBS* pipeline in Asia was more than six times larger at the end of 2005 than it was at year-end 2004—increasing from \$0.6 billion at year-end 2004 to \$4.5 billion at year-end 2005. The firm's European pipeline increased more than three fold from \$1.1 billion at year-end 2004 to \$3.6 billion by the end of 2005 while the U.S. *CMBS* pipeline increase by 61% from \$8.1 billion to \$13.0 billion over the same period. Lehman experienced the second largest increase in *CMBS* pipeline volume also driven by dramatic growth in Europe and Asia, and significant growth in the U.S. From November 2004 to November 2005, European positions increased from \$0.9 billion to \$3.1 billion, Asia increased from \$0.4 billion to \$1.2 billion, and the U.S. pipeline increased from \$4.2 billion to \$6.0 billion.



## RISK MANAGEMENT

Although mortgage securitization businesses face numerous risks (i.e., interest rate risk, credit spread risk, prepayment risk, default risk, and structuring risk), the major risks are interest rate risk (including prepayment risk) and credit spread risk.<sup>20</sup> The degree to which each of these risks impacts the overall risk profile is dependent upon factors such as the loan type (i.e., are the loans residential or commercial) and by the product mix (e.g., fixed rate versus variable rate, prime versus sub-prime, etc.). For example, *CMBS* are susceptible to interest rate risk and credit spread risk, but not necessarily to prepayment risk. Additionally, fixed rate loans, especially residential loans, are much more susceptible to interest rate risk and prepayment than are variable rate loans. For prime and near-prime residential mortgages, the predominant risk factor is interest rate risk. For sub-prime residential mortgages and commercial mortgages, the dominant driver of risk is credit spread exposure.

While firms monitor and track their sensitivities to interest rate and credit spread moves; a sudden shock to credit spreads is a risk that garners special attention from both the business and risk management. Because securitization businesses naturally run a long credit spread

<sup>20</sup> Interest rate risk is the risk that the value of an instrument will decline due to increases in interest rates. Credit spread risk is the risk that the spread over a reference rate will increase for an outstanding debt obligation. This risk is typically driven by perceived credit deterioration by market participants. Prepayment risk is the risk that falling interest rates will lead to heavy prepayments of mortgages or other loans—forcing the investor to reinvest at lower prevailing rates. Default risk is the risk that a bond issuer will default, by failing to repay principal and interest in a timely manner. Structuring risk is the risk that subordination levels change dramatically resulting in the inability to successfully execute the deal, or requiring that the deal be priced down to gain market acceptance.

profile, all the CSE firms, with varying degrees of formality, track the exposure their securitization pipelines have to a significant widening of credit spreads.

The business model across all the CSE firms' mortgage securitization businesses is one of earning a spread rather than taking directional bets or relative value coupon plays and has been dubbed a "moving not storage" business. In this vein, much of the management of the risks mentioned above surrounds making sure that instruments move through the securitization pipeline. To ensure this occurs, there are both upfront risk management processes as well as on-going risk monitoring that takes place. For residential mortgages, the upfront processes include the underwriting (if originating the loans), re-underwriting, and due diligence to ensure that the loans comply with the firm's stated guidelines. In the commercial mortgage business, in addition to due-diligence and underwriting performed on the loans originated, all large loans generally go to both a business and management level committee for approval. Independent risk management functions are represented on the management level committee. In addition to monitoring the key risk sensitivities and market values against established limits, special emphasis is placed on monitoring of aged inventory. This is a key metric in highlighting changes in market conditions and whether inventory may be incorrectly priced.

### Residential Mortgage Backed Securities

In the RMBS space, there are particular risks associated with certain types of residential products that present unique risk management challenges. These exposures include prepayment sensitivity on alternative mortgage products and exposure to residual tranches of residential mortgage securities. While these exposures are generally mitigated through a "moving not storage" business strategy, we have periodically seen concentrated exposures in both these areas.

With respect to prepayment sensitivity, data is quite limited on mortgage products such as option-ARMs and other alternative mortgage products that CSE firms (and the industry in general) have recently been securitizing in large volumes. At least one firm has from time-to-time had significant positions of highly prepayment sensitive interest only tranches based on option-ARM loans and other less transparent mortgage products. In this particular case, these securities are thinly traded, and as such, there is a fair amount of disagreement over what the correct prepayment sensitivities should be. Consequently, risk measurement and price verification efforts can be challenging.

With respect to exposure on residual tranches, sub-prime residential mortgages have required additional scrutiny in recent months. While the vast majority of sub-prime RMBS are sold quickly (and pre-sold through forward sales agreements in many cases), the CSE firms have tended to keep a portion of the residual tranches for several months, the belief being that, due to lack of information, the market has miss-priced these instruments. After a proper amount of seasoning of the pool of loans, the firms have generally been able to sell the residual tranches at a handsome return on investment. While this practice remains the norm in the industry, some firms (e.g., Bear Stearns) have begun selling out these residuals more aggressively. In Bear Stearns' case, the firm was faced with a residuals book that had grown in excess of \$1 billion, which necessitated a change in the businesses' philosophy. Bear Stearns has partnered with a small group of hedge funds to sell, on a forward basis, some of the residual interests that they would have typically held in the past. In exchange for providing the residuals, Bear

Stearns receives a fee from the hedge fund investors. While the upside is limited, this strategy feels much more like “moving not storage.”

Additional risks worth mentioning include counterparty credit risk and legal and operational risk. Counterparty credit risk arises from exposure to originators regarding representations and warranties and put-back rights for bad loans. We have seen some of the smaller, new entrants into sub-prime origination close up shop or have disputes in settling with CSE firms. As firms become more vertically integrated, adding both origination and servicing components, and generally focusing on sub-prime and alt-A borrowers, legal and operational risks increase as well.

### Commercial Mortgage Backed Securities

For commercial loan securitization, bond execution (i.e., securitizing and selling commercial loans as CMBS) is primarily a function of rating agency subordination levels, treasury rates, the shape of the treasury yield curve, swap spreads, and CMBS spreads. Because of this, the risks associated with commercial mortgage securitization that garner the most attention by CSE firms are interest rate risk and credit spread risk, with credit spread risk typically being dominant. Other risks, such as prepayment risk, do not necessarily impact commercial mortgages because commercial borrowers do not tend to prepay like residential mortgage borrowers. Most commercial mortgages contain either prepayment penalties or yield maintenance features that deter borrowers from prepaying. For fixed rate loans, CSE firms mitigate interest rate risk and credit spread risk primarily by hedging with interest rate swaps<sup>21</sup> and CMBS total return swaps (“TRS”). Interest rate risk on floating rate CMBS are typically not hedged because the instruments are less exposed to interest rate movements due to the resetting nature of their coupon. Additionally, since variable rate CMBS generally trade over one month LIBOR, they are not exposed to changes in the shape of the LIBOR yield curve.

Regarding rating agency subordination levels, a key concern is the need to obtain an investment grade rating for the higher pieces of the capital structure. This requires creating sufficient subordination in the capital structure, or tranches that take the losses from defaults before the losses affect the value of the investment grade pieces. CSE firms seek to minimize the subordination required by the rating agencies through various techniques, notably by diversifying the loan assets that form the basis for a particular deal (e.g., by mixing loans backed by properties of different types or in different locations).

Hedging credit spread risk is fairly common for subordination levels down to BBB (i.e., investment grade structures), but becomes more difficult for non-investment grade instruments. Hedging investment grade credit spread risk generally involves shorting baskets of AAA CMBS via total return swaps on an index such as Lehman’s CMBS Index. Since such indexes are not readily available for non-investment grade CMBS, CSE firms have historically placed heavy emphasis on placing the non-investment grade bonds early on in the process. This is an area where some firms have indicated that it is important to be in the moving and not storage business, while other firms (as mentioned below) have begun to relax this standard.

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<sup>21</sup> For investment grade CMBS, CSE firms utilize interest rate swaps to hedge interest rate risk and may use treasuries to hedge the non-investment grade portion if they are not placed early on in the process.

Additionally, the following recent trends in the industry have impacted the risk profile of these businesses: (1) increased exposure to non-investment grade positions stemming from greater retention of mezzanine loans and/or B-notes by some firms; (2) movement down the credit spectrum driven by bridge equity investments; and (3) an increase in large, highly concentrated, “trophy” properties being securitized. The result of these trends has been an increase in the exposure to non-investment grade commercial real estate mortgages and an increase in concentration risk.

Traditionally, CSE firms have brought in buyers (“B-piece buyers”) who purchase the lower part of the capital structure of the deal early in the securitization process. As a result, the lower and non-rated tranches are typically sold out when the securitization is complete, and the firm is only exposed to this risk during the ramp-up phase. More recently, however, firms have increased the amount of loans that they segregate prior to securitization. Rather than contributing all loans to a pool to be securitized and having various levels of tranches from AAA to un-rated, firms have chosen with increased frequency to tranche the loan into three components prior to securitization—investment grade, mezzanine, and first-loss. The firm then contributes the investment grade loan to the pool to be securitized, sells off the first-loss tranche and keeps the mezzanine loan. The rationale for holding onto the mezzanine loans may vary but typically include: (1) taking a view on underlying property, or property manager, where they believe that an event will take place that will lead to a significant credit upgrade and then the firm will either sell the loan later at a profit or contribute it to a securitization; (2) increasing control over a subsequent refinancing or recapitalization; and (3) wishing to aggregate these mezzanine loans to structure a Collateralized Debt Obligation (“CDO”).

At many CSE firms, another recent trend has been to move further down the credit spectrum in the commercial real estate financing business in what is referred to as “Bridge-Equity.” With the increase in the number of properties going up for sale, coupled with the short auction time-frames, the big commercial real estate investors/sponsors, such as Tishman Speyer and Beacon Capital Partners, need partners for both the debt financing and for the equity until they can bring in additional investors such as pension funds or international investors. The agreement is that the CSE firm will be taken out by the new equity investors. If they are not, similar to a bridge loan in the corporate lending space, there are onerous conditions (e.g., the payment of high fees) that are intended to pressure the investor/sponsor into finding additional investors and take the investment bank out of its commitment. If the sponsor is unable to sell the equity, the agreement allows the investment bank to syndicate the equity much more broadly. This equity is typically priced at a discount to the market value, which provides an additional cushion. Lehman Brothers has engaged in these transactions for quite some time,<sup>22</sup> but other CSE firms, including Morgan Stanley and Goldman Sachs, have recently expanded into this practice as well.

While commercial mortgage securitization pipelines generally consist of a diversified portfolio of mortgages across property type (e.g., office properties, multi-family, retail, etc.) and geography, some CSE firms engage in the origination of out-sized commercial loans on single-assets. One of the most extreme examples of this is Goldman Sachs’ \$1.7 billion loan for the acquisition of Rockefeller Center in 2005.<sup>23</sup> One way CSE firms mitigate the concentration

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<sup>22</sup> Lehman Brothers provided more than \$500 million of debt and equity capital to Beacon Capital Partners in 2003 to facilitate the acquisition of the John Hancock Tower in Boston.

<sup>23</sup> There are relatively few block-buster single asset securitizations that occur during a given year.

risk to large single asset loans is by participating in “fusion deals.” For example, a fusion deal may involve the combining of a large single asset loan that has marquee value with other loans to reduce the idiosyncratic exposure to the marquee property. By diversifying in this manner, CSE firms are generally able to achieve better subordination levels from rating agencies.

### The Evolution of Hedging Options

While mortgage securitization businesses have traditionally had a variety of instruments available to hedge the interest rate risk associated with their pipelines, there have been few options for hedging credit spread risk inherent in these portfolios. As a result, both residential and commercial mortgage pipelines at the CSE firms were running up against certain market risk limits, such as credit spread widening scenario limits. However, with the advent of new mortgage derivative instruments, CSE firms have been able to substantially grow their pipelines while mitigating the risk of the businesses to a systemic shock to credit spreads.

For sub-prime residential mortgages, the main hedge against credit spread risk is pre-selling (i.e. forward sales) of certain tranches that is done prior to securitizing the loans. These pre-sales are typically done for very homogenous products for which it is fairly certain that the product will be originated and purchased for securitization by the investment bank. In 2005, additional hedging options such as CDS on Asset Backed Securities (“ABS”) were introduced that allows CSE firms to hedge securitization pipelines. These instruments are dubbed Pay-as-you-go (“PAUG”) swaps,<sup>24</sup> and are used to hedge sub-prime residential, CMBS tranches, and other ABS. The hedges reference security tranches ranging from AAA to BB. Most of the activity in the CMBS space has been in the AAA tranche while sub-prime residential hedging has typically focused on the BBB tranche.<sup>25</sup> In February 2006, CDS IndexCo and Markit Group Limited launched ABX HE, a synthetic ABS index on U.S. home equity (i.e. sub-prime).<sup>26</sup>

For commercial loans, most firms have traditionally used TRS referencing CMBS indices to hedge a portion of the exposure to CMBS spreads for the Investment Grade portion (AAA to BBB) of their pipeline. More recently, similar to the residential side, new synthetic instruments have been created to hedge CMBS spread risk including: (1) CDS on ABS (i.e., PAUGs); (2) new U.S. CMBS CDS benchmark indices (AAA through BBB-); and (3) other products such as CMBS Credit baskets and tranches of CDOs referencing CDS on ABS. It is important to note that while these synthetic positions provide a means for hedging risk, they also introduce new risks (e.g., cash/CDS basis risk and correlation risk) that have not traditionally been associated with RMBS and CMBS securitization businesses. With the advent of CDOs comprised of residential and commercial mortgage assets, issuing firms have become exposed not only to losses from widening credit spreads, but also to changes in the correlation of defaults of the underlying collateral for the deal. This risk is difficult to measure and hence to manage.

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<sup>24</sup> In a pay-as-you-go settlement approach, a credit event triggers a series of payments over time, instead of a one-time settlement as in a corporate CDS. This contract, which uses failure to pay as the sole credit event, attempts to replicate a financial guarantee contract. Rather than making a one-off payment, the protection seller would make good on any shortfall from the asset-backed bond throughout the life of the instrument.

<sup>25</sup> Source: John Schrader’s presentation on “Mortgage CDS (P.A.U.G.s)” to Bear Stearns’ Executive Committee.

<sup>26</sup> ABX HE is based on ISDA’s Pay-As-You-Go template, and is has five sub-indices that are based on the rating of the reference obligations (AAA through BBB-).

## CAPITAL

This section of the report discusses the capital treatment of both commercial and residential whole loans and securities by the five CSE firms. Our intent is to highlight where there are consistencies across the firms as well as highlight firms that are outliers.

One of the first questions when it comes to capital is whether a position is in the trading book or banking book. For the commercial and residential mortgage securitization businesses, the vast majority of the CSE firms' positions are in the trading book. However, there are a couple of exceptions. First, Bear Stearns and Lehman Brothers categorize certain lower or non-rated retained interests in securitizations (e.g., residuals) as banking book positions and have applied higher charges to these positions than would otherwise be generated in the trading book. These charges generate a substantial portion of Bear Stearns' and Lehman Brothers' capital charges for their mortgage securitization activities. With that said, the scope of products to which these charges apply as well as the application of the charge differ substantially between Bear Stearns and Lehman Brothers (see details below).

Secondly, Merrill Lynch has a significant amount of prime mortgages in its investment portfolio. The firm's Prime Loan Trading ("PLT") operation buys Prime loans in bulk and originates prime loans through its Global Private Client financial advisors. As a result of the firm's increased focus on other areas such as sub-prime, the PLT portfolio has decreased over the past few years from 88% of the total average residential mortgage assets in 2003 down to 63% for 2005. These loans are bought for investment and thus considered held to maturity. As such they are in the firm's banking book. At December 31, 2005, the investment portfolio had around \$15 billion of Prime Mortgage loans and generated \$780 million in capital. In contrast, Merrill Lynch's other residential whole loans and RMBS in the trading book stood at \$15 billion as well and generated \$506 million in capital charges (mostly from specific risk add-ons).

The calculation of capital charges for the mortgage securitization businesses at the CSE firms varies but generally consists of a combination of VaR based charges plus standardized specific risk add-on charges (i.e. Reg-Y add-ons). As stated above, a couple of firms (Bear Stearns and Lehman Brothers) also have classified certain retained interests (e.g., residuals) as banking book positions and have applied higher charges on these positions than would otherwise be generated in the trading book. Unlike the other product areas analyzed in OPSRA's cross-firm projects, namely event-driven lending and hedge fund derivative products, the mortgage securitization businesses do generate a material amount of their capital charges from the VaR related component. However, overall, a majority of the capital held against these businesses still comes from both Reg-Y add-on charges and/or charges on banking book positions. As such, the similarities and differences of the firms' approaches in this area are discussed in detail below.

### Regulation-Y add-on Charges

While all CSE firms take some form of add-on charges for these businesses, the application of these charges is not uniform. The scope of positions subject to add-on charges or banking book charges vary firm-to-firm. Some firms take Reg-Y specific risk add-ons on both non-investment grade securities and a portion of the loans awaiting securitization, whereas others just take charges on the non-investment grade security tranches. In addition, the capital treatment by a firm may differ for its residential and commercial mortgage businesses. For



example, one firm, Goldman Sachs, takes no specific-risk charges on its residential mortgage business while taking specific risk charges on virtually all of its commercial whole loans and non-investment grade CMBS tranches.

Below is the scope of the Reg-Y add-on charges on a firm-by-firm basis:

#### Bear Stearns

- 1). Residential – Specific risk add-on charge of 8% is applied to non-investment grade tranches of RMBS. Residential loans do not receive a specific risk add-on charge. (See banking book charges for additional charges on certain residuals).
- 2). Commercial – Specific risk add-on charge of 8% is applied to B-Notes as non-investment grade equivalents. B-Notes are commercial loans (not CMBS tranches) which are not yet investment-grade quality and are not currently slated for inclusion in a securitization. The firm also subjects any commercial loan to undiversified properties (e.g., single asset loan) that is > \$200 million with an 8% specific risk add-on charge. At December 31, 2005, no such exposures existed. As a matter of business practice, Bear Stearns' commercial mortgage securitization business does not typically originate as many concentrated single asset loans as compared to others such as Morgan Stanley and Goldman Sachs. Finally, in contrast to most other firms, Bear does not apply a specific risk charge to its non-investment grade CMBS tranches.

#### Lehman Brothers

- 1). Residential – Specific risk add-on charge of 8% is applied to all non-investment grade tranches of RMBS that are in the trading book (i.e. not 1<sup>st</sup> loss positions). Residential loans do not receive a specific risk add-on charge. (See banking book charges for additional charges on certain retained interests).
- 2). Commercial - Specific risk add-on charge of 8% is applied to all non-investment grade tranches of CMBS that are in the trading book. This is a negligible amount since Lehman puts CMBS positions rated BB and below in its banking book calculation—a very conservative stance compared to its peer firms. (See banking book charges for details). Commercial loans do not receive a specific risk add-on charge.

#### Goldman Sachs

- 1). Residential – unlike all other CSE firms applying Basel II, Goldman Sachs does not take specific risk add-on charges on its residential mortgage securitization positions.

At the time of the review, Goldman had no specific risk charge for residual tranches<sup>27</sup> of its RMBS securitizations. However, the firm was contemplating a variety of options with respect to the capital treatment for such positions including: (1) putting them in the banking book; (2) keeping in the trading book but applying a Reg-Y type add-on; or (3) proving there is a two-way market for these residuals and keeping the current treatment.

- 2). Commercial – while its approach to capital on the residential mortgage side was less conservative than its CSE peers, Goldman applies specific risk add-on charges to a larger scope of its commercial mortgage positions than most of its peers. All commercial whole

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<sup>27</sup> The business stated that they almost always keep the first loss piece off of residential deals.

loans and all non-investment grade CMBS are subject to specific risk add-on charges. Most of the positions will be subject to an 8% charge, but at December 31, 2005 the average charge applied for loans was 5.2% and 7.8% for security tranches. The reason for the lower percentage, particularly with respect to the loans, is that for large loans in excess of than \$250 million, the Credit department will rate the whole loan and, if it is investment grade, it will receive a lower charge. This seems somewhat counterintuitive, the largest positions (e.g. Rockefeller Plaza) will be more likely to be rated by Credit and have lower charges than less concentrated positions.

#### Merrill Lynch

1). Residential – for those positions in the trading book, the firm applies the standard Reg-Y specific risk add-ons for both investment grade and non-investment grade loans. Investment grade loans receive a 1.6% capital charge (equivalent to a 20% risk weight). Similar to the other firms, non-investment grade loans receive an 8% capital charge (equivalent to a 100% risk weight).

2). Commercial - the firm applies the standard Reg-Y specific risk add-ons for both investment grade and non-investment grade loans. Investment grade loans receive a 1.6% capital charge (equivalent to a 20% risk weight). Similar to the other firms, non-investment grade loans receive an 8% capital charge (equivalent to a 100% risk weight).

#### Morgan Stanley

1). Residential - the firm applies the standard Reg-Y specific risk add-ons for both investment grade (mostly 1.6%) and non-investment grade loans and RMBS (8%).

2). Commercial – the firm applies the standard Reg-Y specific risk add-ons for both investment grade (mostly 1.6%) and non-investment grade loans and CMBS (8%).

#### Banking Book Charges (Residuals)

As discussed above, both Bear Stearns and Lehman Brothers apply some rather large charges on a portion of their lower and non-rated retained interests from securitizations. These particular charges represent a substantial portion of both firm's capital for their mortgage securitization businesses and, based on the size of their mortgage businesses relative to their entire operations, they represent a material amount of the capital charges for the firms as a whole. The other firms, Goldman Sachs, Merrill Lynch, and Morgan Stanley are much more diversified, whereas Bear Stearns and Lehman Brothers are heavily weighted towards their mortgage operations (particularly residential mortgages).

Below we discuss both the scope of products which receive a banking book type charge and the calculation of the charge for Bear Stearns and Lehman Brothers:

#### Bear Stearns

For Bear, these charges apply only to unrated residuals within the firm's residential mortgage business. At December 31, 2005, the total amount of these unrated residuals stood at \$1.540 billion.

Rather than calculating a capital charge on these positions per se, Bear simply deducts 50% of the value of the residuals, \$770 million as of December 31, 2005, straight from Tier 1 and Tier 2 capital. These pseudo banking book charges represented over 51% of the total

capital charges for the residential mortgage business and roughly 48% of the total mortgage securitization business at December 31, 2005.

As stated previously in the write up, Bear Stearns has started to shift away from holding its residuals and has moved to pre-selling a substantial portion of these tranches. Any substantial change in the amount of these positions held on the books will greatly change the amount of capital required to be held at Bear.

### Lehman Brothers

For Lehman, these banking book charges apply to a much wider variety of lower and non-rated security tranches for both the commercial and residential mortgage securitization businesses. Also, the firm applies a dollar for dollar charge against these positions (equivalent to a 1250% risk weight).

The banking book for residential mortgages consists of non-rated positions, residuals, NIM residuals and first loss positions in Lehman originated deals.<sup>28</sup> This excludes new issue residuals (NIMs),<sup>29</sup> which are captured in VaR as part of the trading book. As of December 31, 2005, these positions were approximately \$307 million.

The banking book for the commercial mortgage business consists of all CMBS tranches rated BB and below. The banking book capital charge for this business was less than the RMBS space, as the firm typically does not retain non-investment grade tranches on CMBS deals. As of December 31, 2005, these positions were \$150 million.

The banking book charges at Lehman Brothers at December 31, 2005 were \$457 million. This represented 57% of the capital charge for the mortgage securitization businesses. Adding in specific risk charges on non-investment grade securities, these non-VaR charges represented over 62% of the capital charge for the mortgage securitization businesses.

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<sup>28</sup> Unlike Bear, we have recently confirmed that Lehman's business strategy regarding residuals, particularly off of sub-prime deals, continues to be to hold and wait for the underlying loans to season before looking to an exit strategy.

<sup>29</sup> During the review, the firm stated that these positions were approximately \$200 million and roll-off quickly (i.e. short duration).

## GLOSSARY

### Loan Type Definitions

**Adjustable Rate Mortgages (“ARMs”)** – Mortgage loans in which the interest rate changes periodically, usually in relation to an index, and payments may go up or down accordingly.

**Alt-A Loans** – Alt-A mortgage loans consist primarily of loans that are first lien loans made to borrowers whose credit is generally within typical Fannie Mae or Freddie Mac guidelines, but that have loan characteristics that make them non-conforming under those guidelines. For instance, the loans may have higher loan-to-value (“LTV”) ratios than allowable or may exclude certain documentation or verifications. Therefore, credit decisions are more reliant upon the borrowers’ credit scores and the adequacy of the underlying collateral

**Hybrid ARMs** – Hybrid ARMs provide a fixed initial interest rate for a fixed period of time, followed by periodic rate adjustment, typically once a year. For example, a 3/1 hybrid ARM has an initial fixed rate for the first three years, after which time the interest rate shifts to variable, resetting annually.

**Conventional Loans** – Loans that meet the size and underwriting criteria set by Fannie Mae and Freddie Mac. The current limit is \$417,000 for single family loans.

**High Loan-to-Value Loans (“HLTV”)** – HLTVs are mortgages where the loan is greater than 85% of the value of the property. Normally the loans are made to borrowers with good credit ratings and are used for debt consolidation.

**Jumbo Loans** – Loans that exceed size limits set by Fannie Mae and Freddie Mac, but conform in all other respects.

**Option ARM** – An adjustable rate mortgage loan with the option of four different monthly payment amounts: minimum payment, interest only, full principal and interest (30-year term) and full principal and interest (15-year term). These loans typically have a low initial fixed interest rate for a specified period of time. Beyond the fixed interest period, rates are subject to adjust monthly based on the specified index. Payment option amounts after the initial fixed interest period are subject to change annually. Deferred interest, or negative amortization, is possible with these loans.

**Second Mortgages/Home Equity Lines of Credit (“HELOC”)** – Loan made after there is already one mortgage recorded against the property. Typical reasons usually include cash out, debt consolidation, establishing an equity line of credit.

**Sub-prime Loan** – Loans to borrowers whose creditworthiness or loan quality does not meet the standards of a conventional mortgage. Sub-prime borrowers are segmented into A-, B, C, C- or D based on the credit, income, and LTV ratios. Such loans have a higher risk of default than loans to conventional borrowers. Generally, sub-prime borrowers display a range of credit risk characteristics that may include one or more of the following:

- Two or more 30-day delinquencies in the last 12 months or one or more 60-day delinquencies in the last 24 months.
- Judgment, foreclosure, repossession, or charge-off in the prior 24 months.
- Bankruptcy in the last 5 years.
- Relatively high default probability as evidenced by, for example, a credit bureau risk score (FICO) of 620 or below (depending on the product/collateral).
- Debt service-to-income ratio of 50% or greater, or otherwise limited ability to cover family living expenses after deducting total monthly debt-service requirements from monthly income.