

Clarifying the U.S. Mortgage Crisis: CONTEXT AND CONSEQUENCES

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The crisis unfolding in the U.S. mortgage industry has given many the opportunity to opine on the villains and victims, as well as the potential solutions being put forth. However, not enough has been written about the root causes of the current crisis and the confluence of events that led to the current situation, or of the potential ramifications yet to unfold. To assess the current situation and outlook, it is important to understand how we got where we are today. From that perspective, one can then better understand why the bad loans were ultimately made, why they are defaulting now, and what the future might hold.

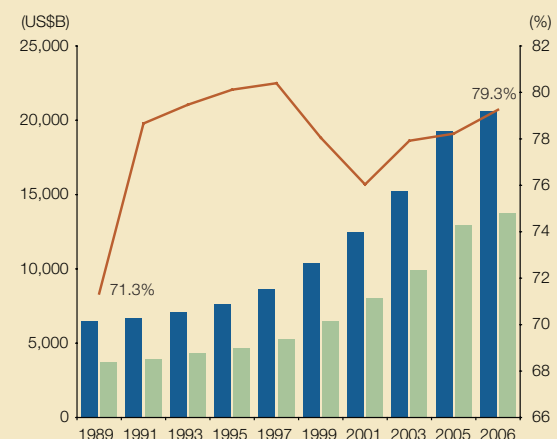
How Big Is the U.S. Mortgage Market?

The U.S. mortgage market is one of the largest pools of debt in the world, with total loans outstanding of just under \$11 trillion at the end of 2006. The U.S. Federal Reserve estimated the value of U.S. household real estate at \$20.6 trillion at the end of 2006, implying that the average household had 46.6% equity in its home (conversely, this puts loan-to-value or “LTV” at 53.4%). Excluding the 25 million homeowners who have no debt against their residence and assuming homeowners with a mortgage have homes that are valued, on average, at the same level as those with no mortgage, puts that \$11 trillion of debt against homes with a value of \$13.8 trillion. This would imply LTV of 79.3%.

While the amount of debt outstanding has roughly doubled since 2000, the increase, at an annualized pace of just over 10%, is not that alarming. As Figure 1 shows, the average LTV has increased for those borrowers with a mortgage from the level of about 20 years ago, but has actually not changed much since the early 1990s.

FIGURE 1: HOW BIG IS THE MORTGAGE MARKET?

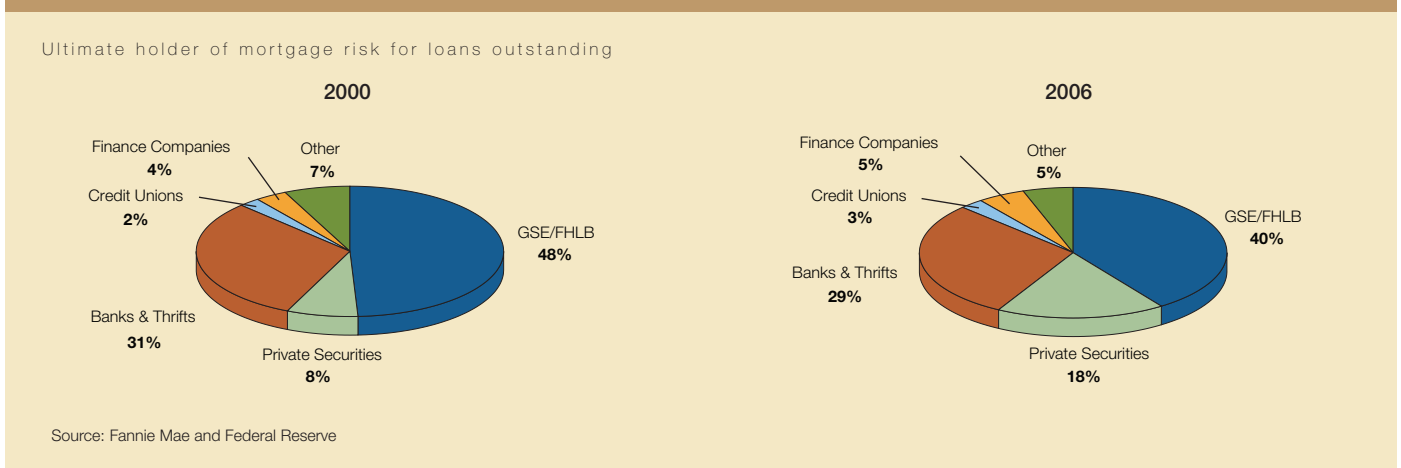
Mortgage debt outstanding vs. value of household real estate



■ Est. Value of U.S. Household Real Estate
■ Est. Value of U.S. Household Real Estate with existing lien
— Est. LTV of all mortgage debt with existing lien

Source: Fannie Mae, Federal Reserve, U.S. Census Bureau

FIGURE 2: WHO HELD THE RISK?



One of the key changes in the mortgage market this decade is the ultimate ownership of risk. In 2000, the government-sponsored enterprises (“GSEs”) Fannie Mae and Freddie Mac had yet to encounter their accounting issues and were the dominant market participants, owning or guaranteeing 48% of the risk in the U.S. mortgage industry (*Figure 2*). Banks and thrifts were the second-largest participants with 31%, and private securities (primarily nonconforming securitizations and loans) represented only 8% of the risk.

Part of the reason the GSEs and Federal Home Loan Banks (“FHLBs”) dominated the market in 2000 is that most of the loans originated at the time were conforming. For example, in 2001, 57% of loans were conforming, 9% were subprime, and only 3% were Alt-A.¹ Given the lower cost of funds enjoyed by the GSEs and FHLBs, their market share of outstanding debt remained high, as banks could not derive enough of a return from conforming mortgages to justify holding the loans. Banks typically would only be interested in maintaining ownership of nonconforming and home equity loans, which had higher rates and better asset/liability characteristics that could be matched from a funding duration perspective.

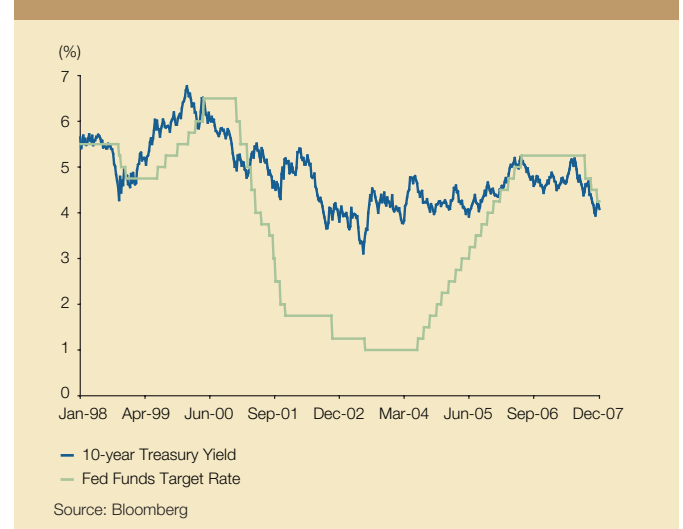
How Did the Rate Cuts of 2001 to 2003 Contribute to the Mortgage Bubble?

Much of what transpired from 2004 to 2006 resulted from actions in the period from 2001 to 2003. To put that time period in context, key issues from 2001 to 2003 were the technology/media/telecom (“TMT”) bust, “fallen angels” (corporate credit ratings that fell from investment grade to default, typically because of some type of corporate malfeasance), recession, and the fear of Japanese-style deflation. It is worth noting that in November 2002, Ben Bernanke made his

widely repeated statement about a “helicopter drop” of money to fight deflation. This comment reflected the seriousness of deflation fears, especially as Japan, at the time, was showing no signs of recovery.

Given all of these concerns, the Federal Reserve Open Market Committee (“FOMC”) slashed the federal funds target rate from 6.50% in mid-2000 to 1.00% in mid-2003. Over the same time period, 10-year Treasury yields declined from over 6.75% in early 2000 to just over 3.00% in mid-2003 (*Figure 3*). A number of factors drove the decline in the 10-year yield, including mortgage servicer hedging requirements and the U.S. Treasury’s discontinuation of 30-year bond issuance. Ultimately, the decline in the 10-year Treasury yield was the most significant, as this note forms the basis for the rate charged on most 30-year fixed rate mortgages.

FIGURE 3: THE FED SLASHED INTEREST RATES



The decline in the 10-year yield led to a refinancing boom, as borrowers were able to lower their mortgage payments and, in many cases, extract cash at tax-advantaged rates to pay down other non-mortgage debt, renovate their homes, or do any number of other things. As Figure 4 shows, the MBA Refinancing Index hit hitherto unseen levels as a result.

A corollary to the refinancing of mortgage loans, however, was that the investors who had funded the old mortgages found their loans being prepaid at levels never seen before. The Constant Prepayment Rate (“CPR”) on bonds issued by Fannie Mae rose to an annualized pace of over 70% in mid-2003 as the 10-year yield bottomed. This rate implies that a 30-year fixed rate mortgage would have had duration of only 1.5 years versus the more normal assumption of 5-7 years (Figure 5).

In 2003 alone, 30% of all U.S. mortgage debt outstanding was refinanced. Total mortgage origination of \$3.95 trillion included \$2.8 trillion of refinanced loans. Mortgage volume in 2003 was 37% above the previous year’s record \$2.89 trillion and 78% above 2001 levels.

For mortgage borrowers, the decline in rates was a tremendous tailwind that kept reducing their debt service burden. But for the investors who ultimately funded the loans (bank treasurers, insurance companies, pensions, asset managers, etc.), the environment was anything but good. They watched their mortgage portfolios, which were then yielding 6% or higher, be prepaid when they could only reinvest the funds in new mortgages with coupons as much as 200bps lower than the ones being replaced or, worse yet, hold cash equivalents paying a mere 1%.

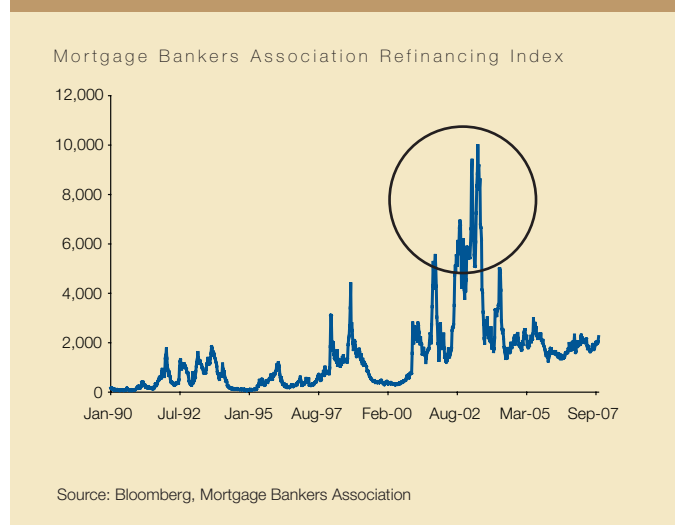
While many investors chose to replace prepaid mortgages with new ones yielding 4-5%, others chose a different path.

Why Did Investors Embrace Nontraditional Mortgages?

As the TMT bubble burst and Enron and WorldCom failed, the 2001-2003 period was clearly one of weak credit quality in the corporate sector.

By contrast, mortgages were considered a safe alternative. Historically, mortgages had much lower credit losses with, as one would expect, lower yields reflecting the lower risk. In the period from 2001-2005, however, the mortgage risk seemed to decrease even further, to abnormally low levels. With record refinancing and with lower interest rates making more expensive homes affordable, real estate prices rose at a dizzying pace.

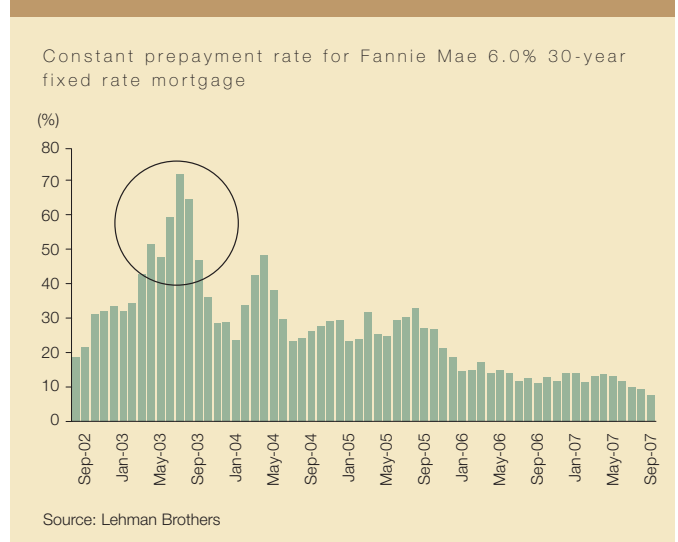
FIGURE 4: REFINANCING EXPLODED



While each city and state in the United States had historically seen home price trends driven primarily by local dynamics, such as employment trends, population migration, and supply constraints, lower interest rates drove prices upward on a national basis. Through our work with Professor Emma Rasiel, PhD, Director of Undergraduate Economics of Duke University, Lazard Asset Management found that the correlation of home prices rose from a level of 0.75-0.80 in the 1980s to over 0.95 in the period from 2000-2005. Effectively, the drivers of home prices shifted from local economic factors to more national financing factors.

The lower interest rates, lower debt-service burdens, and ensuing home price increases combined to ensure that even

FIGURE 5: PREPAYMENT RATES REACHED RECORDS



A subprime mortgage is a loan to a borrower with a FICO® score of less than 620. This score is a gauge of a borrower's expected propensity to satisfy financial obligations. Subprime mortgages are not mortgages for low-quality or low-cost properties. As these loans were extended to borrowers with a demonstrated history of problematic debt payments, subprime mortgages typically carried a higher interest rate and fees.

An Alt-A mortgage is a loan extended to a borrower who has incomplete documentation of income, assets, or other variables that are important to the credit underwriting processes. These loans were originally extended primarily to the self-employed or recent immigrants lacking multiple years of documentation of steady income. To mitigate the risk of the reduced documentation, Alt-A mortgage loans were originally structured to require more equity from the borrower and a higher interest rate or fees.

Nontraditional mortgages are subprime and Alt-A loans for the purposes of this paper. This term should not be confused with nonconforming mortgages, which include jumbo loans (*see definitions below*).

Government-sponsored enterprises (GSEs) are financial services corporations created by the U.S. Government to encourage affordable home ownership. In the context of home finance, the term primarily refers to Fannie Mae (the Federal National Mortgage Association) and Freddie Mac (the Federal Home Loan Mortgage Corporation). The term can be used more broadly to include Ginnie Mae (the Government National Mortgage Association) and Federal Home Loan Banks.

Agency-eligible mortgages are loans that meet the qualifications set by regulators for purchase or guarantee by GSEs.

Nonconforming mortgages are loans that do not meet the standards that allow purchase by GSEs. The primary requirements are loan-to-value (LTV) equal to or less than 80% (implying the buyer has at least 20% equity) or private mortgage insurance to cover excess risk. The loan amount is also capped each year based on guidance from OFHEO (the Office of Federal Housing Enterprise Oversight), the regulator of the home finance GSEs. This limit is based on the change in the average home price based on an annual survey by the Federal Housing Finance Board conducted each October. It is released in the final week of November each year. The conforming limit has been \$417,000 since 2006.

A jumbo mortgage is a loan that exceeds the conforming limit and which GSEs therefore cannot purchase or guarantee. The limit for 2006, 2007, and 2008 has been \$417,000.

borrowers encountering difficulties, such as job loss, could sell their homes and retain the accumulated equity. In other cases, borrowers could refinance into lower payments or tap undrawn equity from the accumulated home price appreciation to fund necessities until the difficult period had passed.

From the perspective of investors, it became “clear” that mortgages were even safer than had been previously assumed. One key assumption in the nontraditional mortgage business was that the underlying drivers of default were essentially the same between prime and subprime borrowers. The common belief about prime borrowers had long been that the last bill a borrower would fail to pay was his mortgage. After all, a person needs somewhere to live. Thus, the ultimate driver of losses in prime mortgages was considered unemployment. The leap of faith was that the same applied to subprime borrowers.

If mortgages were safer, it made sense that nonconforming mortgages might be a great solution to the prepayment dilemma, as these loans had higher interest rates and generally carried prepayment penalties. In fact, the loan structure was ideal, in that most subprime loans came with a 2- or 3-year fixed-rate period after which the loans would reset to a floating rate. The typical loan started with an interest rate of 7-8% for the initial period with a reset to something on the order of LIBOR plus 600bps thereafter. Considering the alternative of prime mortgages with yields less than 5%, these loans looked very attractive to investors.

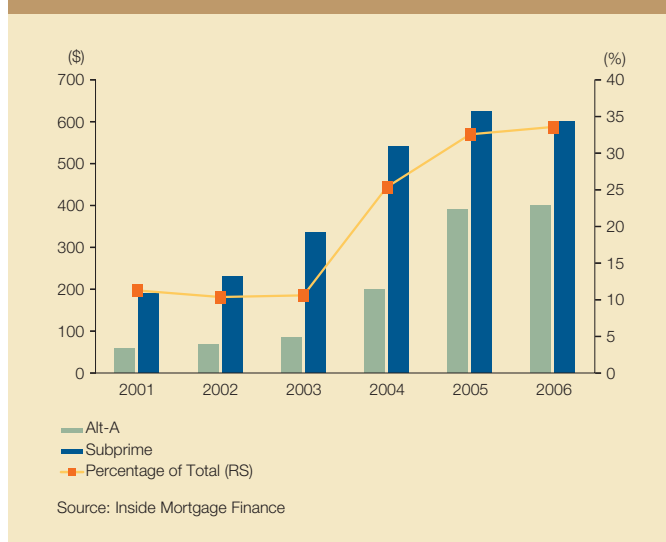
And just as demand for nonconforming mortgages was expanding, mortgage originators began to see refinancing volume decline. As rates stabilized in 2003 and most of the borrowers who had the incentive to refinance worked their way through the system, mortgage origination firms that typically recognized income in a gain-on-sale model realized that they needed a new source of loan volume to absorb the excess capacity that had developed through the refinancing bubble.

Thus, the needs of investors and originators coalesced. Investors wanted yield and duration, and origination firms wanted volume and higher gain-on-sale margins. Subprime and Alt-A were the answer. From 2003 onward, these nontraditional loans became the mainstay for many gain-on-sale originators as the FOMC took away the proverbial punch bowl and began raising interest rates in 2004.

From 2001 to 2003, the combined volume of subprime and Alt-A mortgages represented roughly 11% of total originations each year, rising in tandem with overall originations from \$190 billion of subprime and \$60 billion of Alt-A to \$335 billion and \$85 billion, respectively, an increase of 68%. In 2004, volume really began to lift off. By 2005, subprime origination totaled \$625 billion and Alt-A volume hit \$390 billion. This \$1 trillion of nontraditional volume now represented 33% of all mortgages originated (*Figure 6 on the next page*).

Not only did volume soar, but quality also collapsed. From 2000 to 2006, underwriting standards were thrown by the wayside as investors continued to enjoy strong credit performance, even from nontraditional mortgages. Why? This was because home prices had continued to increase rapidly, with the biggest increase seen in 2006, when the average home price across the United States rose almost 16%. While the increase in home prices was partly driven by low absolute rates, they were also driven by new financing structures in the nontraditional space and beyond that had brought new marginal buyers into the market. Their impact could be seen in the volume of purchase loan origination in 2005 and 2006, which continued

FIGURE 6: SUBPRIME AND ALT-A ORIGINATIONS SOARED



to rise even though interest rates had increased. This higher purchase volume represented the addition of less creditworthy borrowers in the marketplace. These additional buyers contributed further to home price increases.

Mortgage originators had also realized that the golden product they had created, one that every two years, when the interest rate on a subprime mortgage would reset, would typically be refinanced because the reset payment would no longer be affordable. When the subprime borrower refinanced, he would pay new origination fees that would accrue to the originator, who would then sell the loans into the market at a large gain-on-sale margin. The borrower felt good, as appreciation in the price of his home sustained more debt and payments remained low. Originators were happy, as they got more fees. Investors were happy, as credit losses remained low because the loans were “re-underwritten” every 2-3 years.

Unfortunately, by the end 2006, the seeds of today’s crisis had been sown. In 2000, only 20-30% of subprime loans had reduced documentation. By 2006, almost 50% of these loans did not have full documentation. In 2000, only 5% of subprime borrowers had no equity. By 2006, 60% of subprime loans used to purchase a home (as opposed to refinance) had LTV of at least 100%.²

How Were These Loans Funded?

Given what we know now, it is natural to ask why or how anyone would fund these loans. To answer that, we need to look to Wall Street.

The process of securitization had been around for a long time by 2003. It was most commonly used for credit cards, automobile loans, and mortgages. With nontraditional mortgages, investment banks took securitization to another level, as they effectively were resecuritizing the tranches of a residential mortgage-backed security (RMBS) for which there was not enough demand.

Figure 7 on the next page illustrates how subprime loans were securitized into an RMBS, which was itself then sold into further structures alongside nonmortgage assets. This illustration is extremely important to understanding where the risk went, and even where it is today.

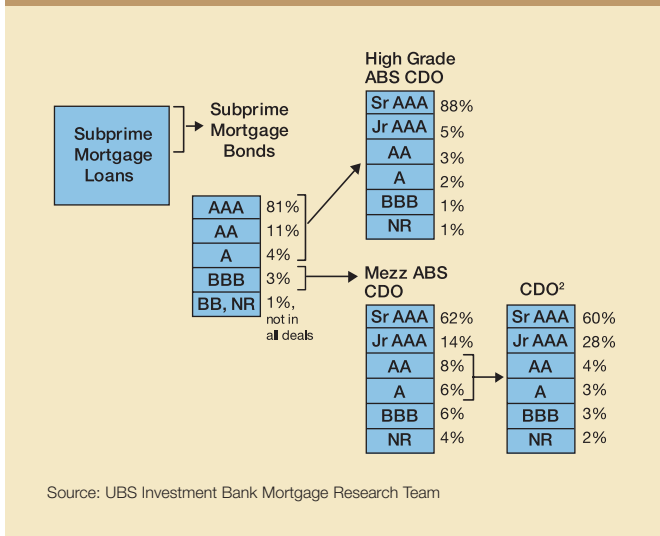
The average subprime mortgage is about \$200,000. Thus, if an investment bank were to put together a \$500 million securitization it would need a portfolio of 2,500 loans. These loans would be put into a trust where the cash flow of all the loans would be pooled and then disaggregated according to the layers of risk purchased by each investor. There are several key factors that made the RMBS an effective mechanism for funding loans.

- **Excess collateralization:** While 2,500 loans were needed in the example above, these structures typically had excess collateral. That is, there might be 2,550-2,575 loans with debt of \$510-515 million backing \$500 million of bonds. The goal of having excess collateral was to absorb some of the early losses expected from subprime loans.

Figure 7 on the next page shows a “BB, Not Rated” tranche of the RMBS. This tranche was often called the “equity” tranche, as the owners took the equity risk. Typically 1% of the bonds were considered BB. Below these bonds, there was typically 2-3% of excess collateral. [This excess collateral is not shown. The percentage figures next to each rating class are indicative and, while similar in magnitude, could differ in each deal.]

- **Diversification benefits:** By pooling hundreds, if not thousands, of loans across a range of geographies and borrowers, securitization greatly reduces the risk of lending in the wrong neighborhood or to a class of borrower that might be adversely impacted by local economic events.
- **Losses work their way up the capital structure:** In the example in the illustration, a bond investor in the equity tranche would earn a very high interest rate, typically 20%. To the extent there were credit losses beyond the level of the excess collateral, the equity investor’s capital would be at risk. However, in the period from 2001 to 2006, losses were

FIGURE 7: HOW WERE THE LOANS FUNDED?



rare. As noted above, borrowers typically could not make the payments on a subprime mortgage after the interest rate reset. These borrowers would thus refinance, and when they refinanced, the bond owners were prepaid and no credit losses were incurred. Equity investors therefore enjoyed 20% returns even while federal funds rates were anywhere between 1% and 5%.

Given this environment, equity tranches were easily sold by the Wall Street firms securitizing subprime mortgage loans. At the other end of the capital structure, the AAA tranches were also easily sold or retained by the Street, as they were deemed to be very safe.

- Expected cumulative losses: Even with diversification, the RMBS was structured with an expectation that there would be losses. Over the life of the loan, the assumed cumulative loss rate was in the mid-single digits. Structures were designed with an “absolute worst case” scenario of 6-8% cumulative losses in 2005 and 2006, even as recent experience had fallen well short of such losses. In fact, some people considered these loss rates excessively conservative.

Selling the equity and AAA tranches raised over 80% of the capital for the RMBS. The middle tranches were a more difficult story, since the risk associated with those was much higher than that of the AAA tranche and the coupons were nowhere near 20%. Instead, these tranches yielded anywhere from tens of basis points above LIBOR at the AA level to perhaps 100-200bps over LIBOR at BBB.

This is where asset-backed security collateralized debt obligations (“ABS CDOs”) were important. Rather than retain these risky layers, investment banks sold them into ABS CDOs. There are two types of ABS CDOs, as shown in Figure 7: High Grade ABS CDOs and Mezzanine ABS CDOs. The former take their collateral almost entirely from the A to AAA tranches of the RMBS (and from other ABS CDOs). The Mezzanine ABS CDOs take the bulk of their collateral from the tranches that are rated BBB+ and below. Key considerations in an ABS CDO include:

- Other assets: In a High Grade ABS CDO, anywhere from 40-50% of the collateral in the structure is comprised of subprime mortgages. Collateral composition has varied over time, with an additional 10-20% being other ABS CDOs, 20-40% being prime mortgages, less than 5% second liens on mortgages, and the remainder (10-20%) other collateral, including auto and credit card loans. Importantly, in High Grade ABS CDOs, the percentage of the subprime collateral that was AA- or AAA-rated fell from roughly 90% in the first half of 2005 to only 60-65% in the second half of 2006, while the A-rated portion made up the difference.³

In a Mezzanine ABS CDO, the collateral composition varied over time as well. In the first half of 2005, roughly 60% of collateral was comprised of subprime mortgages, 20% was prime mortgages, less than 5% was other ABS CDO paper, less than 5% was second liens on homes, and about 15% was other forms of debt, such as auto and credit card loans. By the second half of 2006, the collateral composition had deteriorated to being over 80% subprime, with an additional 5% of other ABS CDOs. Over the same period of time, the portion of subprime collateral rated BBB or below rose from roughly 85% to almost 100%.

- Excess collateralization: There is no excess collateral in these structures.
- Diversification benefits: The structures and the related credit ratings are premised almost entirely on the presumed diversification benefits of mixing other RMBS tranches and non-subprime mortgage collateral.
- Losses work their way up the capital structure: As with an RMBS, ABS CDOs prioritize cash flows. However, these structures often have additional features including rating-related triggers that can reprioritize cash flows among the tranches to ensure that AAA tranches are protected, to the extent possible, if credit deteriorates.

To the extent there was not enough natural demand for ABS CDOs, Wall Street created ABS CDO² (“CDO-squared”) structures that were comprised of tranches of other ABS CDOs. The amount of such structures outstanding is small, but nonetheless highlights the degree to which Wall Street practitioners had convinced themselves that risk could be disaggregated into ever-smaller pieces and diversified away.

What Turned a Mortgage Crisis Into a Credit Crisis?

The first cracks in the subprime mortgage industry began to appear in the fall of 2006. At that time, the first meaningful instances of early payment defaults (“EPDs”) were encountered. An EPD is a situation in which the mortgage borrower fails to make even the first payment. But this issue seemed to go away—until early 2007, when it came back with a vengeance.

The primary reason for the surge in EPDs appears to be a combination of fraud (on the part of mortgage brokers and borrowers) and the end of home price appreciation in many parts of the country. Home prices peaked in a range of metropolitan areas between late 2005 and late 2006. With no more home price appreciation to bail out borrowers encountering problems, defaults began to rise.

The markets were quick to recognize the issue and shut off a significant portion of the funding that had been available to subprime mortgage originators. Originators found themselves required to buy back loans under representation and warranty provisions related to EPD situations, yet unable to raise the funds necessary to buy back the loans. These firms started to sell out in distress and close their doors. The ABX Index, which measures the cost of buying protection against the various tranches of RMBS structures, gained prominence in early 2007, as speculators shorted subprime mortgages by buying protection in the credit default swap market.

After the first quarter of 2007, the subprime environment seemed to stabilize. But that stabilization was short-lived.

As summer came, the first signs of problems at the Bear Stearns High-Grade Structured Credit Strategies Fund and the Bear Stearns High-Grade Structured Credit Strategies Enhanced Leverage Fund arose (hereafter, “BSAM funds”). The question that was asked by most market participants at the time was how two funds that were “high-grade” could be having problems.

The underlying issue was that the assets owned by the funds were in fact highly rated by credit rating agencies, but the underlying collateral backing these highly rated assets was, in reality, largely subprime mortgage exposure. And loss expectations for subprime mortgages originated in 2005 and 2006 were rocketing.

Assumptions for cumulative losses in RMBSs quickly rose from the traditional 4-5% to 12-15% by late summer. The increase in cumulative loss assumptions invalidated the key assumptions of the ABS CDOs that had been issued over the prior years. As importantly, the demise of structures that had been deemed to be safe due to the virtues of models and financial alchemy led investors to question the underlying credit ratings of an entire range of structures.

Soon after the BSAM funds hit the headlines, subprime exposures began to crop up in a range of unexpected places. The German bank, IKB Deutsche Industriebank, had to be rescued after it consolidated off-balance-sheet vehicles with subprime holdings and lost access to liquidity. Within days, American Home Mortgage extended the maturity date of its outstanding extendible asset-backed commercial paper and then declared bankruptcy. BNP Paribas froze withdrawals from three investment funds, citing an inability to accurately calculate net asset values. Market participants began to panic, leading the European Central Bank to inject funds into the marketplace in an attempt to stabilize the banking sector.

The following week, on 16 August 2007, Countrywide Financial Corporation tapped its bank credit lines after finding itself unable to secure short-term funding in the commercial paper markets at reasonable rates. The following day, the U.S. Federal Reserve cut the discount rate by 50bps and encouraged major money center banks to borrow at the discount window, traditionally a last-resort source of funds, so as to encourage other banks facing liquidity problems to borrow.

At this point, panic had truly set into the financial system. Risk in the financial system is often measured by the “TED spread,” the difference between the 3-month LIBOR and 3-month T-Bill rates. The difference reflects the incremental yield paid by banks for financing above the rate paid by the U.S. government. As shown in Figure 8 on the next page, the TED spread exploded from as low as 13bps in 2003 to 240bps on 20 August 2007. (The only time the spread was higher in the last 25 years was on 20 October 1987, when the TED spread hit 300bps as the U.S. equity markets crashed.) Similarly, the cost of protection on subprime mortgages, as measured by the ABX Index, exploded again (*Figure 9 on the next page*).

Why Did the Subprime Music Stop in 2007?

Home prices stopped rising across much of the United States between late 2005 and late 2006. Through 2007, home price appreciation turned into home price depreciation. According to OFHEO, in the third quarter, almost 48% of metropolitan areas showed a sequential decline in home prices over the previous quarter (*Figure 10 on the next page*). Areas that previously had scorching increases in prices are now seeing nominal increases at best. OFHEO reports on the prices of transactions for homes that qualify for conforming loans. Given that these loans are capped at a mortgage of \$417,000, the sample has its shortfalls (e.g., fewer than 20% of California transactions were included in 2006), but the data are useful as a read on national home prices.

Another notable gauge of home prices are the S&P/Case-Shiller® Home Price Indices published by Standard & Poor's. These indices include repeat transactions for condominiums and homes across all price ranges, but only in 20 metropolitan areas. Thus, the series captures a better sample of the high-end home market, but it has limited geographic breadth. According to Case-Shiller, as of October 2007, for the second consecutive month every metropolitan area measured saw home prices decline from the prior month. There could clearly be seasonality to these numbers, but comparisons to the prior year period showed that 17 of the 20 areas saw home prices decline. Tampa, Miami, San Diego, Las Vegas, Phoenix, and Detroit led the declines from a year ago, with price depreciation in excess of 10%.

FIGURE 8: THE TED SPREAD SPIKED

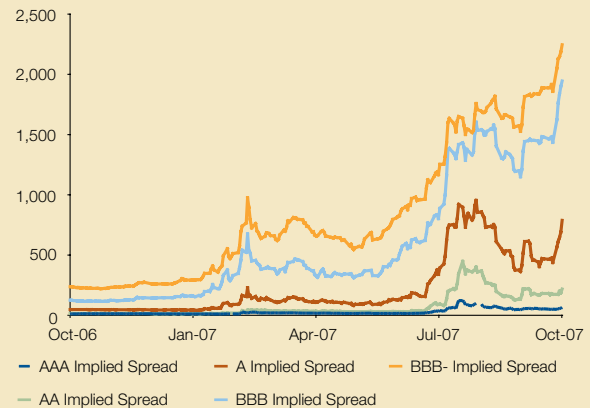
Spread between 3M T-bills and 3M LIBOR



Source: Bloomberg

FIGURE 9: ALL CONFIDENCE EVAPORATED IN SUBPRIME MARKETS

ABX.HE 06-1 Spreads



Source: Lehman Brothers

It is clear from the points made thus far that home price appreciation was the lynchpin sustaining the entire subprime mortgage industry.

So in 2007, when home prices declined instead of appreciating, the model broke as its underlying assumptions were disproved. Market expectations for cumulative losses on subprime mortgages rocketed to levels as high as 25-30% for the 2006 origination year (Bear Stearns projection, which assumes 50-60% of loans defaulting and a 50% loss given default).

Should 25-30% cumulative losses be experienced in the context of original securitization assumptions of 4-5%, even AAA-rated tranches could face losses. Moreover, the ABS CDOs that were constructed primarily from lower-rated tranches could end up seeing the entire subprime mortgage component of collateral written off.

Needless to say, the ability of nontraditional mortgage borrowers to refinance loans has disappeared. Where subprime mortgage origination totaled \$600 billion in 2006, origination fell to only \$28 billion in the third quarter of 2007; Alt-A origination, which had totaled \$400 billion in 2006, fell to only \$54 billion. Put another way, \$250 billion per quarter of origination declined to \$82 billion, a fall of 67%. The spillover contaminated the entire nonconforming mortgage arena, as only loans guaranteed by Fannie Mae and Freddie Mac found buyers. This lack of financing has continued to put downward pressure on home prices, as buyers cannot obtain financing and sellers become more distressed.

What Is the Market Implying Now?

Based on analysis conducted by Lehman Brothers, the ABX Index currently implies cumulative defaults of 15-25% for the loans originated in the second half of 2006. The wide range reflects the number of variables incorporated in the modeling of such loss expectations and the pricing of different tranches.

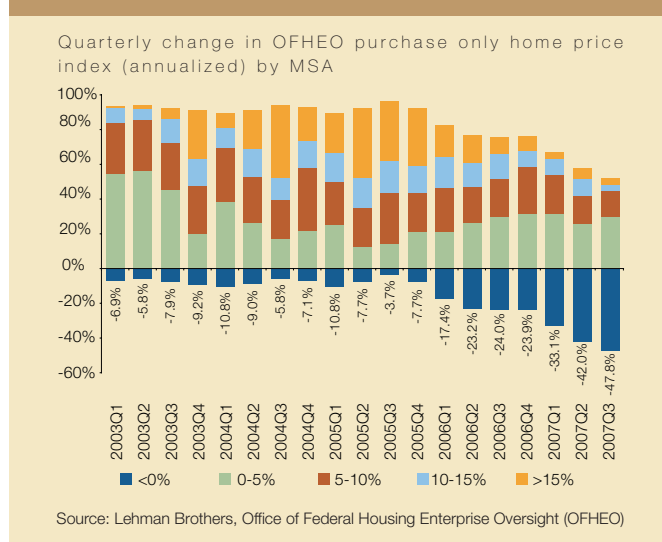
Adding to the loss expectations is the large pipeline of loans originated in late 2005 and through 2006 that will reset over the next several quarters. In each month through late 2008, subprime mortgages of \$15-25 billion will be resetting to higher rates that are typically unaffordable to mortgage borrowers. In light of these pending resets, Lehman Brothers forecast that as many as 900,000 homes will see foreclosure in 2008, and that another 1 million will in 2009 (*Figure 11 on the next page*). Bear Stearns estimates that as many as 450,000 homes will see foreclosure in the fourth quarter of 2008 alone.

Foreclosures are a problem, in that the price received for a home as a result of foreclosure is typically as much as 20-25% lower than it would be otherwise.⁴ In an environment in which home prices are already declining at double-digit rates in key bubble markets, the addition of thousands of homes at even deeper discounts is likely to only aggravate the situation.

Another vexing consideration in this scenario is the potential percentage of total home sales comprised of foreclosures. Lehman Brothers anticipates total home sales of approximately 5 million (1 million new homes and 4 million existing homes) in 2008 and 2009. This would suggest that 18% of home sales in 2008 and 20% in 2009 could be as a result of foreclosure. These figures compare to a more typical 3-6%. Significant additional downward pressure on home prices could thus be a result.

It is important to remember that we defined subprime mortgages as those loans to borrowers with blemished credit histories. Thus it is the borrower, not the home, that is subprime. Analysis by Lehman Brothers showed that subprime loans are often next door to prime loans. Lehman found that subprime mortgages comprise between 25-75% of the loans in 55% of the ZIP codes in the United States. Therefore, the remaining 25-75% of the loans in those ZIP codes are not subprime. We can consider these ZIP codes as having moderate overlap between subprime and non-subprime loans, accounting for 57% of all U.S. mortgages. Going one step further, 24% of all U.S. mortgages are in the 21% of ZIP codes where 40-60% of mortgages are subprime loans, implying that in these ZIP codes there is an almost equal representation of prime and subprime loans. So this is not an issue of select “subprime” neighborhoods; the situation is widespread.

FIGURE 10: HOME PRICES ARE FALLING



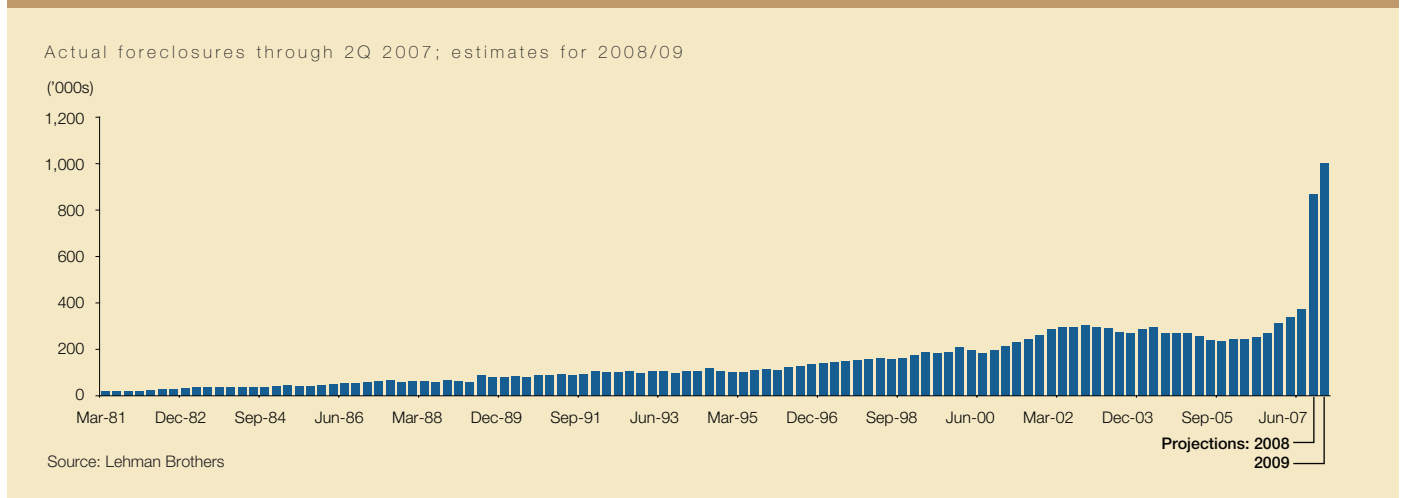
What Are the Milestones to Watch?

What began almost seven years ago as an attempt to avert deflation and mitigate the pain of the bursting of the TMT bubble and ensuing recession led to a series of events that continue to unfold today. The search for yield and duration amidst the refinancing boom and the simultaneous need of originators for new products to replace decreasing volume led to “affordability products” that have become anything but affordable. It is now clear that these products were funded based on a series of assumptions including diversification benefits, excess collateral, and, most importantly, low cumulative losses. While the low losses were premised largely on strong employment trends, the real driver was home price appreciation, which itself was a result of providing credit to new uncreditworthy borrowers.

With home prices now declining in the vast majority of key metropolitan areas, the road ahead is uncertain. Further pain in the mortgage industry is a given, but it is not clear how far prices have to fall to reach a new equilibrium based on credible underwriting and sustainable financing. To ascertain where the industry and ultimately the economy are headed, we at Lazard Asset Management are watching a number of factors. Our ultimate objective is to determine which scenarios are most probable, so we can value companies in the various environments in which they might operate. Based on this analysis, our objective is to build bottom-up portfolios that can perform well in a range of macroeconomic scenarios.

Among the most important questions are the degree to which the subprime mortgage crisis will spill over into the prime mortgage arena and the impact this spillover might have on the

FIGURE 11: FORECLOSURE EXPECTATIONS HAVE JUMPED



overall economy. Given that the troubles are no longer ring fenced, we are watching a range of items, including, but not limited to:

1. The impact of mortgage rate resets on default rates.
2. Potential mitigating factors, such as the Paulson plan announced early in December.
3. Foreclosure rates through 2009 and their impact on overall home prices (which further affects losses on loans that have defaulted).
4. Risk to consumer confidence and spending.
5. The potential impact on unemployment.
6. The degree to which economic growth slows.
7. The potential impact of an economic slowdown on the value and financing of commercial real estate (and the potential that problems here aggravate a recession to the extent one occurs).
8. Political and regulatory risk.

Perhaps the most important factor for determining future economic patterns and the impact on company profitability is how the government responds to the current crisis. There are calls for Washington to intervene and change the terms of existing mortgages to protect the borrowers. Such a precedent could be extremely dangerous as one of the primary reasons why the United States has been a destination for capital for so many years is the confidence investors have in the sanctity of contracts.

Mortgages are governed by contracts, as are the various securitization processes. A lender can agree to change the terms of a loan, but some current proposals in Washington involve third

parties adjusting the terms of contracts on behalf of investors who funded the loans. Changes to loan terms are allowed under the pooling and servicing agreements (PSAs). However, based on existing contracts, these changes are required to be based on examination of the individual borrower, with the ultimate decision based on the best interests of the investors who funded the loan. Simply making a sweeping adjustment to loan terms would not comply with these contract requirements. To date, Congress has shown no willingness to legislate protection for the servicing companies to make such changes. In our view, any such legislation could well breed yet another set of unintended consequences, much as did the rate cuts of 2001-2003.

Having said that, it is clear that there will be significant amounts of discussion and debate about the causes and consequences of the subprime mortgage boom and bust. What is clear to us is that investors must always be diligent about understanding the assumptions underlying their decisions to invest or not invest in any security. Simply assuming that the assertions of others are correct (e.g., unemployment drives all mortgage losses) can be detrimental to an investor's results. Moreover, as we have all learned before, risk does not go away, it simply moves. The theory that innovation in the securities industry can eliminate risk has been discredited yet again. We believe prudently assessing risk and returns based on a lucid analysis of the underlying drivers is the only way to succeed over the long term in investing. As we move forward, our objective is to deploy the deep expertise of our investment platform to assess each opportunity diligently to build a disciplined portfolio that can perform well in a range of macroeconomic scenarios.

Investing at Lazard

At Lazard Asset Management, we invest on a bottom-up basis. While the focus is on each individual company, the analysis we perform requires an understanding of the larger macroeconomic factors that influence each company's profitability. Our work on mortgages is a great example of the value a deep industry expertise can have in identifying which investment opportunities offer the best risk/reward profile. In this case, our fundamental research kept us away from the vast majority of mortgage-related investments. Lazard's fundamental research process focuses on return analysis and accounting validation that are used to enhance our modeling, valuation, and recommendation around each stock.

- We look for the key profitability drivers for each company, ranging from company-specific to macroeconomic factors. Investigating how management can influence company profitability leads us to the right questions to ensure that we clearly understand strategic plans and the capital requirements to achieve them.
- Accounting validation involves understanding the relationship amongst the statement of cash flows, the income statement, and the balance sheet. By taking into account material company-specific accounting decisions that might impact actual cash flow and profitability as well as on- and off-balance-sheet risk factors, we can better compare the returns and valuation of companies within and across industries and countries.
- Return analysis and accounting validation are then used in the modeling and valuation assessment of each stock, with the objective of identifying key potential scenarios for each company and the probability of their occurrence. We are then able to decide if a stock fits into a portfolio given the parameters and objectives of each client's mandate.

Beyond the individual stock analysis, our portfolio management teams carefully examine our holdings to ensure that we do not take unwanted or unintended risks within or across sectors. By incorporating risk and reward analysis in addition to an understanding of key drivers for each company, we are able to construct a portfolio that is designed to achieve each client's objectives in a range of macroeconomic scenarios.

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NOTES

- 1 Source: Inside Mortgage Finance
- 2 Source: Bear Stearns
- 3 Source: Lehman Brothers
- 4 Source: Anthony Pennington-Cross, "The Value of Foreclosed Property" (a Federal Reserve Bank working paper), September 2004

IMPORTANT INFORMATION

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