FitchRatings

Structured Finance

U.S. Subprime RMBS in CDOs

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■ Summary

U.S. subprime residential mortgage-backed securities (RMBS) has represented the largest collateral asset class in structured finance (SF) collateralized debt obligations (CDOs) since the inception of the product in 1999. In earlier vintage SF CDOs originated from 2000–2002, subprime RMBS typically comprised between 30% and 40% of the collateral securities, generally reflective of the overall distribution of SF issuance by asset class. This range has trended higher since these early deals, in part as a result of the overall growth in subprime RMBS issuance but primarily because of the poor performance of certain sectors, namely franchise loans, 12-b1 fees, aircraft, and manufactured housing (MH) and the subsequent SF CDO negative rating actions. Following these negative rating actions, many SF CDO investors sought to avoid CDOs that contained securities from these sectors. In general, U.S. RMBS was and still is considered by many SF CDO investors to be the safest collateral asset class.

As a result, subprime RMBS now comprises 40%–60% of most diversified SF CDOs, and prime and subprime RMBS together, including all non-MH RMBS sectors, represent 60%–75% of most newly issued diversified SF CDOs. Additionally, numerous SF CDOs issued in 2004 were heavily concentrated in U.S. RMBS, with concentrations ranging from 75%–100%, a considerable portion of which frequently consisted of subprime RMBS. This has inextricably linked the performance of SF CDOs with that of U.S. subprime RMBS.

This report examines Fitch Ratings' treatment of these assets in SF CDOs and provides an overview of the subprime RMBS sector, including highlights of Fitch's rating approach. It also addresses some of the growing CDO investor concerns, including the rise of subprime interest-only (IO) mortgages and the risks posed by available funds caps (AFCs) in a rising interest rate environment.

■ Highlights

- The performance of recent vintage SF CDOs is inextricably linked to the performance of subprime RMBS and will be greatly affected should the sector deteriorate significantly.
- Fitch's three RMBS correlation categories cap potential RMBS diversification and limit confusion associated with multiple subprime RMBS product types.
- All RMBS is highly correlated to regional and national home price trends.
- Fitch's enhanced recovery rate matrix features additional collateral rating and tranche thickness categories for added granularity.
- U.S. subprime RMBS has performed better than expected to date, with 1,905 affirmations, 200 downgrades, and 207 upgrades in 2004.

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- Fitch maintains a stable outlook for the performance of subprime RMBS in light of continued economic improvements and home price appreciation (HPA), albeit at lower rates for 2005.
- Rising interest rates, coupled with a slowdown in HPA, could put stress on leveraged subprime borrowers.
- Fitch has noted an overall increase in IO mortgages, junior lien, and limited income documentation loans, which adds increased risk to subprime RMBS pools.
- Higher average Fair Isaac Corp. (FICO) scores, a decrease in low-balance and MH loans, and an increase in average subprime RMBS credit enhancement levels have helped to reduce risk in subprime RMBS.
- Fitch's approach to rating subprime RMBS incorporates multiple stress scenarios that simultaneously include reduced HPA and rising interest rates.

◼ Product Description

Subprime Mortgage Loans

Over the course of the development of the subprime mortgage market, many products and programs have been introduced. Various sectors and industry descriptions have emerged, including subprime, B/C, home equity, high loan-to-value ratio (LTV), and Alt-B, just to name a few. The different product types have led to some confusion regarding how different types of mortgage loans are defined and treated for securitization purposes. Yet these different categories have been driven primarily by lenders and span across the major characteristics of mortgages that drive default probabilities and loss severities.

Fitch generally defines a subprime borrower as one with a credit profile worse than that of a prime A quality borrower, whose credit report typically would reveal no recent mortgage delinquencies and a FICO score above 680. However, other factors may influence whether or not a particular mortgage loan would be considered subprime. These include documentation requirements, originator program, risk premium, debt-to-income ratio, loan purpose, LTV, and loan type. Regardless of mortgage subsector, mortgage credit risk is determined largely by analyzing the same underlying characteristics for all mortgage loans. These characteristics, along with Fitch's view of the sector and approach to rating subprime RMBS, are discussed later in this report.

◼ SF CDO Rating Analysis

This section will give a brief overview of Fitch's approach to rating SF CDOs, with a particular focus on the treatment of and issues surrounding subprime RMBS as collateral in CDOs.

VECTOR

An important component of Fitch's CDO rating methodology is the Fitch default VECTOR model (VECTOR), a portfolio analytics tool that uses Monte Carlo simulations that incorporate default probabilities, recovery rates, and asset correlations to calculate potential portfolio default and loss distributions. Using a multistep process, at every annual step in the simulation, the asset portfolio is updated, defaulted assets are removed, asset histories are updated, and default events and recoveries following default are recorded. VECTOR also incorporates sector-specific correlations calibrated to the term of the Monte Carlo simulation, while intra-industry correlations are evaluated by a factor analysis of industry and idiosyncratic exposures.

Rating

Fitch's assessment of default probability for a pool of collateral securities is based on the credit quality of the securities, usually measured by their ratings. Since many underlying assets in a CDO typically are rated by Fitch, this rating will be the primary reference for portfolio analysis. However, if no Fitch rating is available, Fitch will accept the lowest public rating assigned by another nationally recognized statistical rating organization unless Fitch identifies a clear difference of opinion on a particular security. This is based on research that has shown that within the SF markets, including subprime RMBS, all three rating agencies have demonstrated similar ratings performance, both at issuance and over time.

Correlation

Fitch has identified six sectors and 45 subsectors in the U.S. for the calculation of correlation across SF products. RMBS represents one of the six primary sectors, and three subsectors have been identified within RMBS. These are: prime; subprime; and MH. In assessing correlation within RMBS, it is necessary to ask, "What populations exist within RMBS that are more likely to move together in a way not expected by chance alone?" Although numerous product types exist within the residential mortgage arena, only three categories have exhibited relatively unique profiles that have historically shown distinct performance patterns under stress. Although loan types and credit

RMBS Correlation Matrix
(%)

	Prime	Subprime	MH
Prime	30	—	—
Subprime	25	45	—
MH	20	25	55

RMBS – Residential mortgage-backed securities.
MH – Manufactured housing.

U.S. Corporate Correlations
(%)

	Intersector	Intrasector
Average	14.5	22.3
Minimum	5.9	14.0
Maximum	22.4	37.3

risks may vary across mortgage products, Fitch caps the potential diversification credit by limiting possible classifications to three. The reason for this is that from a correlation perspective, all RMBS sectors are highly correlated with each other because their performance is largely dependent on home price trends. The Fitch categories allow for some diversification benefit within these three populations, but they are still relatively highly correlated to each other.

In terms of assigning specific RMBS portfolios to the Fitch subsectors, all nonprime, non-MH RMBS is generally grouped into the subprime RMBS category. This would include most RMBS pools with weighted average FICO scores of less than 700, those categorized as A–, Alt-B, home equity, high LTV, hybrid adjustable-rate mortgage (ARM), and other product types. This results in the most conservative treatment possible for what is usually the largest SF CDO asset type, subprime RMBS.

The matrix in the table above shows Fitch's intrasector and intersector correlation assumptions for RMBS subsectors. These correlations are also shown on the VECTOR Inputs page in VECTOR.

As can be seen from the above matrix, the highest correlation within RMBS is the intrasector correlation for MH of 55%. This is the highest correlation level assigned within the VECTOR. This is because the MH industry is highly dependent on a few players and servicers, which was evident in the downfall of the MH industry; the bankruptcy of its largest player, Conseco Finance Corp., had a domino effect throughout the industry. The lowest RMBS intrasector correlation of 30% is assigned to the prime sector, the largest sector within all of SF in terms of number of lenders and servicers, as well as the largest number of regions and borrowers. In terms of intersector correlations, the lowest correlation assumed within RMBS of 20% is between the MH and prime sectors, which clearly vary the most across the three sectors. However, 20% is still relatively

high in consideration of the correlation of all RMBS to overall movements in residential home prices.

To put these numbers in perspective, the table above shows the average, lowest, and highest Fitch intersector and intrasector correlation assumptions for corporate sectors. As can be seen from the table, the average U.S. corporate intrasector correlation is 22.3%, with a range of 14%–37%. This compares with the lowest RMBS intrasector correlation of 30%. Similarly, the average U.S. corporate intersector correlation is 14.5%, with a range of 6%–22%. This compares with the lowest RMBS intersector correlation of 20%. The reason for the conservatism in RMBS sectors relative to corporate sectors is twofold. First, correlation assumptions across SF are more conservative than those used for corporate debt due to the lack of data. SF lacks the robust and long histories of the corporate markets through varying economic cycles. Second, all RMBS is correlated to U.S. residential housing markets.

Recovery Rate Assumptions
Recovery rates for RMBS depend on a security's priority within the capital structure of the issuer, the credit rating of the respective tranche, and the tranche size within its own capital structure. In general, the smaller a tranche is in relation to the total amount of the capital structure, the greater the loss absorbed by that tranche. Fitch takes this into account by applying lower recovery rate assumptions to nonsenior tranches, as well as to smaller sized tranches. Fitch's newly enhanced recovery rate matrix, shown in the table on page 4, features three categories of tranche thickness as a percentage of original capital structure: 0%–5.99%; 6%–10%; and greater than 10%. It also features additional collateral rating and seniority categories, which add granularity and can accommodate multiple asset types.

Fitch generally assigns lower recovery rates for SF than for comparably rated corporate securities. This is because of the senior-subordinate structure of most SF securities, as well as the uncertainty associated with SF recovery rates due to lack of data. For example, for most diversified SF CDOs, the most common type of

Fitch Ratings Recovery Rate Assumptions for RMBS in CDOs
(%)

Collateral Security	Liability Stress					
	'AAA'	'AA'	'A'	'BBB'	'BB'	'B'
SF Senior 'AAA'	80	83	86	89	92	95
SF Nonsenior 'AAA'	65	70	75	80	85	90
SF Senior 'AA'	65	69	73	77	81	85
SF Nonsenior 'AA' (Greater Than 10%)	50	56	62	68	74	80
SF Nonsenior 'AA' (6%–10%)	45	51	57	63	69	75
SF Nonsenior 'AA' (0%–5.99%)	40	46	52	58	64	70
SF Senior 'A'	60	64	68	72	76	80
SF Nonsenior 'A' (Greater Than 10%)	40	47	54	61	68	75
SF Nonsenior 'A' (6%–10%)	35	42	48	55	61	68
SF Nonsenior 'A' (0%–5.99%)	30	36	42	48	54	60
SF Senior 'BBB'	55	59	63	67	71	75
SF Nonsenior 'BBB' (Greater Than 10%)	30	38	46	54	62	70
SF Nonsenior 'BBB' (6%–10%)	25	33	41	48	56	63
SF Nonsenior 'BBB' (0%–5.99%)	20	27	35	42	50	55
SF Senior 'BB'	50	54	58	62	66	70
SF Nonsenior 'BB' (Greater Than 10%)	15	19	23	27	32	35
SF Nonsenior 'BB' (6%–10%)	10	14	18	22	27	30
SF Nonsenior 'BB' (0%–5.99%)	5	9	13	17	21	25
SF Nonsenior 'B' (Greater Than 10%)	12	16	20	24	28	32
SF Nonsenior 'B' (6%–10%)	8	11	15	19	23	27
SF Nonsenior 'B' (0%–5.99%)	3	7	11	14	18	22
SF Rated Lower Than 'B'	0	4	8	12	16	20

RMBS – Residential mortgage-backed securities. CDOs – Collateralized debt obligations. SF – Structured finance.

security would be a 'BBB' rated subprime mortgage bond that is part of a senior-subordinate capital structure and represents a relatively small portion of the entire capital structure. This would correspond to the SF 'BBB' Nonsenior (0%–5.99%) category from the table above. The recovery rates range from 20% in an 'AAA' scenario to 55% in a 'B' scenario. This compares with Fitch's recovery rate assumptions for a senior unsecured investment-grade corporate security, which range from 44% in an 'AAA' scenario to 55% in a 'B' scenario.

The correlation and recovery rate assumptions in this report are current as of the date of publication. For Fitch's latest recovery rate and correlation assumptions, see the VECTOR Inputs page in VECTOR, available on Fitch's web site at www.fitchratings.com. For more information on Fitch's rating methodology for CDOs, see Fitch Research on "Global Rating Criteria for Collateralised Debt Obligations," dated Sept. 13, 2004, also available on Fitch's web site at www.fitchratings.com.

Servicer Concentration Limits
In addition to Fitch's CDO portfolio default and recovery analysis, Fitch has developed guidelines for limitations on a CDO's exposure to individual servicers of RMBS within a particular CDO. In general, a CDO may not have more than 7.5% of the collateral pool invested in securities that are serviced by any one servicer rated below a Fitch 'S2' or with a long-term financial rating lower than 'A–', if there is no servicer rating available. Fitch's servicer concentration guidelines are shown in the table below. In some cases, Fitch has been comfortable with exceptions to these guidelines, particularly in situations where the underlying loans are originated by a third party or the loans are special serviced with an underlying primary servicer. This mitigates the exposure to the crash of a particular origination shop or vintage. Frequently, this is the case in some RMBS concentrated CDOs. Exceptions to the guidelines have also been allowed for highly rated collateral securities that are less likely to be affected by the circumstances of a particular originator/servicer or for securities distributed across different asset types, particularly if they are serviced by different groups within the institution.

Fitch Ratings Servicer Concentration Guidelines for RMBS in CDOs
(%)

Servicer Rating/Long-Term Financial Rating	Portfolio Limit
Below 'S2'/'A–'	7.5
'S2'/'A–'	15.0
'S1'/'AA–'	25.0

CDO – Collateralized debt obligation. RMBS – Residential mortgage-backed securities.

Fitch rates residential and commercial mortgage primary, master, and special servicers on a scale of 'S1' to 'S5', with 'S1' being the highest rating. Fitch servicer ratings were established to provide investors and other market participants with a clear indication of servicers' capabilities based on a quantitative benchmark assessment.

Available Funds Caps

Some CDO investors have inquired about the effect of rising interest rates on AFCs in subprime RMBS. AFCs represent a mechanism in many subprime mortgage deals that prevent the coupon on floating-rate liabilities from rising above the periodic weighted average coupon on the fixed-rate assets in a rising interest rate environment. From a rating agency perspective, barring any other hedging techniques that address the fixed-rate asset/floating-rate liability mismatch, the AFC prevents a negative excess spread situation. However, excess spread compression still must be factored into a rising interest rate scenario. Fitch's RMBS group does exactly this in its rating analysis by modeling RMBS transaction cash flows under various interest rate and prepayment scenarios. These will be discussed later in this report *(see Prepayment Speeds, page 8, and Interest Rate Mismatch, page 9)*.

In terms of the risk to RMBS investors of the coupon being capped at the AFC (AFC risk), many subprime RMBS transactions contain caps and corridors that protect investors substantially from this scenario. These bonds may also be sold at a discount to account for the AFC risk. Another potential mitigant to AFC risk has been the issuance of bonds that follow a similar path as the underlying hybrid ARMs in the portfolio. For example, a portfolio of newly originated 2/28 ARM subprime mortgages would have fixed-rate assets for two years that would then revert to floating-rate coupons. The RMBS security would also offer a fixed-rate coupon for two years and then revert to a floating-rate spread over the London Interbank Offered Rate (LIBOR). Although the match may not be perfect, it would decrease the probability of the coupon on the bond reaching the AFC in a rising rate environment.

For typical 'AAA' subprime RMBS floaters, Fitch's RMBS group expects that most AFCs would not be triggered unless LIBOR increased by 400–500 basis points. Caps and corridor hedges usually provide protection for LIBOR increases of up to 800–900 basis points. For 'BBB' subprime RMBS floaters, Fitch's RMBS group estimates that a LIBOR increase of approximately 250 basis points could trigger AFC risk. Analyses have also shown that as long as defaults remain low, excess spread may be available to cover AFC shortfalls in many deals.

SF CDO asset interest cash flows may be affected by AFC risk in a rising interest rate environment. This is because the coupon on the affected security could be lower than expected if the cap were reached. Although VECTOR has the capability to incorporate AFCs for individual securities, currently, they are not accounted for specifically in Fitch's CDO transaction analysis. There are a number of reasons for this. Collateral security amortization schedules usually are provided by CDO structurers on an aggregate basis for an entire portfolio. This means that AFC risk could only be accounted for using a rule-based, portfolio approach. Given the layering of worst-case variables that already exists in the cash flow modeling of CDOs, this methodology would be too imprecise to yield accurate, meaningful results. This is only further complicated for revolving transactions that are exposed to this risk on a changing basis during ramp-up and over time. However, in its effort to provide more granular, accurate analysis, Fitch is exploring various avenues to properly account for AFCs and other security-specific features in CDO cash flow analysis.

■ Performance and Outlook for Subprime RMBS

Subprime mortgage loan performance has remained strong. According to Fitch's subprime delinquency indexes as of March 2005, delinquencies of 60 days or more (as a percentage of original balance) reached 1.19% at the five-month mark for vintage 2004, versus 1.56% and 1.54% at the five-month mark for vintages 2003 and 2002, respectively. Contributing to the positive trend was a historically low interest rate environment, despite one-month LIBOR increasing to 2.61% by February 2005 from 1.12% in January 2004, and, more importantly, a strong housing market. The chart on page 6 shows subprime delinquencies of 60 days or more expressed as a percentage of original balance for vintage years 1997–2004. The chart shows poorer performance for vintages 2000 and 2001 versus performance for the more recent vintages, which had the benefit of declining interest rates through early 2004 and strong HPA.

Home prices appreciated nationally by 11.9% during 2004, versus 8.9% in 2003, with HPA reaching

Subprime Annual Delinquencies of 60 Days or More

— 1997	— 1998	⋯ 1999	— 2000
▪ 2001	▲ 2002	✕ 2003	○ 2004
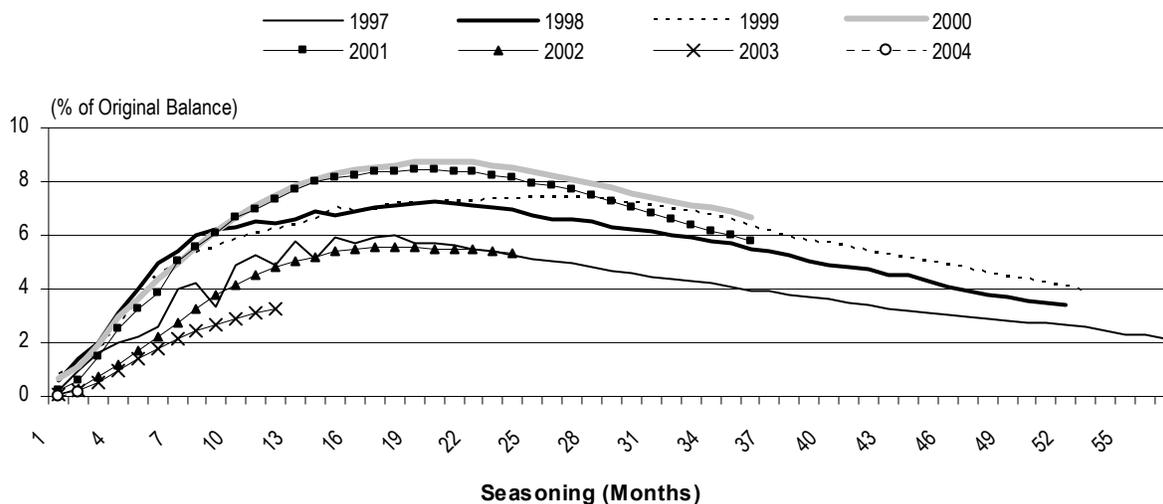
Source: Fitch Ratings subprime mortgage loan performance.

17.8% on the coasts, where many of the securitized pools are concentrated. Subprime RMBS transactions benefited from high rates of voluntary prepayments and stable severities caused by increasing home prices. As home prices increased, borrowers were able to monetize new equity build-up and pay off their existing mortgages or other forms of debt, lower their overall debt burdens, and in turn, lower their default risk. Subprime RMBS has also performed well despite declines in the amount of excess spread available to cover losses due to rising interest rates. The reason for this compression in excess spread is that many transactions are backed by collateral (assets) that have fixed-rate coupons for some period of time while the bond (liabilities) coupons float. As interest rates rise, the interest liabilities become more expensive, while the interest received from assets remains fixed.

Fitch's outlook for the sector in 2005 remains stable as a result of continued economic improvements and HPA. Nevertheless, rising short-term interest rates may continue to compress the excess spread available to cover losses in some subprime RMBS transactions despite recent tightening in spreads. This is likely since lenders generally have not increased coupons on subprime loans at the same pace that LIBOR has increased. Furthermore, subprime borrowers could come under stress if interest rates rise at a faster pace than anticipated and HPA slows substantially. The combination of higher debt costs and less equity to cash out will slow prepay speeds as the incentive to

refinance decreases. If that scenario were to occur, more borrowers would lose the ability to lower household debt burdens, potentially increasing default probabilities. Loss severities also could see increases due to the slower equity build. However, the effect in the near term should not be severe due to continued HPA, albeit at a lower rate. Economy.com projects 2005 HPA at a healthy 9.1% nationally and 12.3% on the coasts, as well as continued economic improvement in the form of low unemployment and reasonable gross domestic product growth. Continued HPA should have a positive impact on both defaults and severities, offsetting the squeeze on excess spread.

Fitch's RMBS group stresses both HPA and interest rates in its rating analysis. Fitch's interest rate stresses include LIBOR up, down, and flat scenarios. These are overlaid with Fitch's prepayment stresses that capture, among other things, the potential reduction in excess spread resulting from fixed-rate mortgages and floating-rate RMBS in a rising interest rate environment. Fitch's market value decline (MVD) stresses also account for regional historical home price volatility so that home prices in areas that have experienced wide swings, such as parts of California and the Northeast, are severely haircut in the rating analysis. For example, the Bergen-Passaic New Jersey 'AAA' MVD stress is approximately 64%, San Francisco's is approximately 57%, and some regions in California have 'AAA' stresses in excess of 70% *(see charts, page 7)*. Fitch continues to

MVDs for Bergen-Passaic, NJ: Down 64.16% 'AAA'
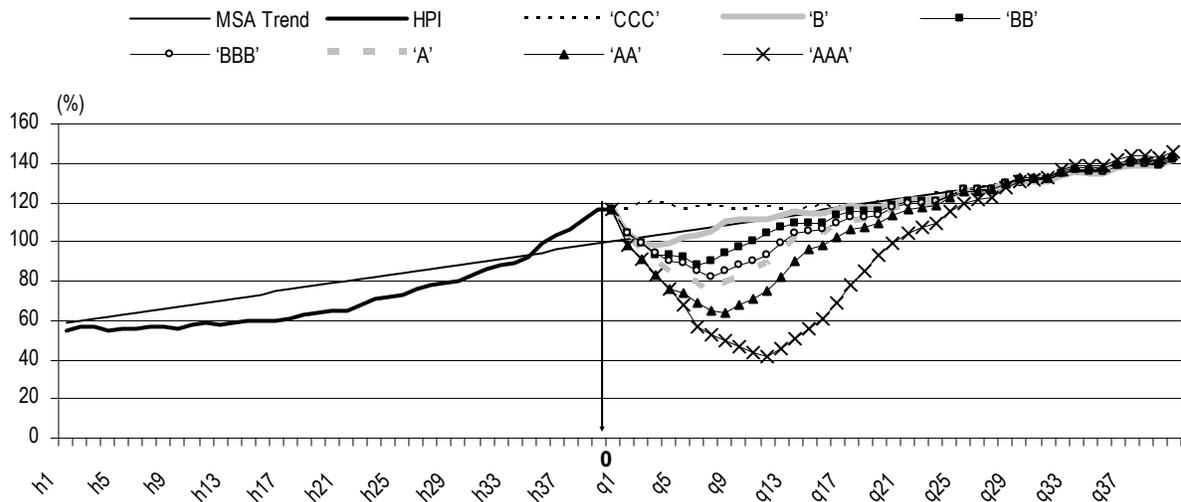
MVDs – Market value declines. MSA – Metropolitan statistical area. HPI – Home Price Index. h – Historical quarter. q – Quarterly forecast.

monitor the performance of this sector, as well as the various factors affecting performance.

■ **Subprime RMBS Rating Analysis**

Collateral Analysis

As with most SF collateral types, an important component of the collateral analysis for a pool of subprime mortgage loans involves the development of a default probability and loss severity (LS)

assumption for each loan in the pool, at each rating category. For all types of residential mortgage loans, because borrower default most often results in the foreclosure of the property, the default probability is often referred to as the frequency of foreclosure (FOF) of the loan. Primary FOF drivers include: the amount of the loan divided by the value of the home (LTV); the borrower's credit history, usually in the form of a FICO score; mortgage product type; risk premium (a Fitch-defined variable measuring relative

MVDs for San Francisco, CA: Down 56.80% 'AAA'
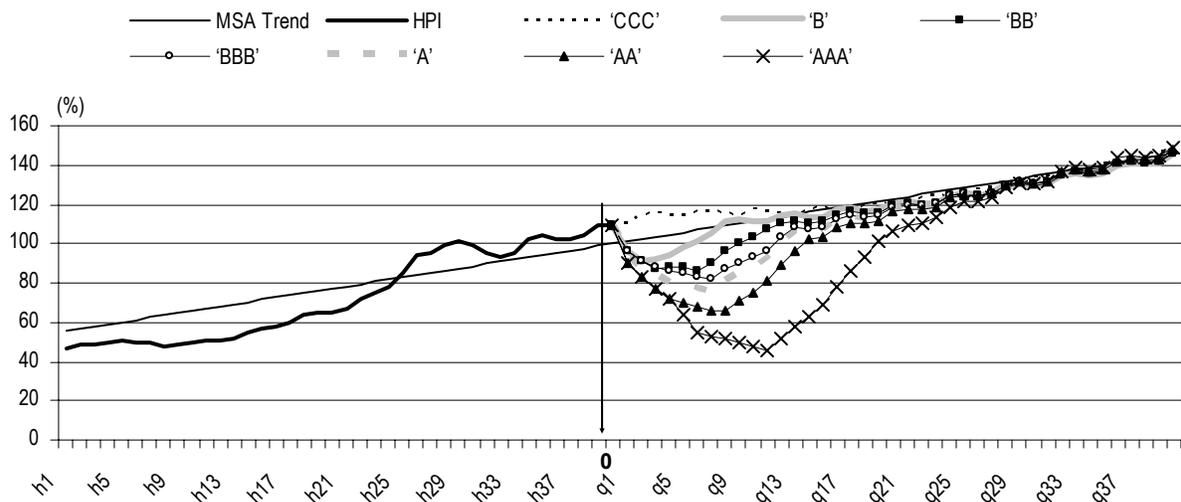
MVDs – Market value declines. MSA – Metropolitan statistical area. HPI – Home Price Index. h – Historical quarter. q – Quarterly forecast.

interest cost given the interest rate environment at origination); debt-to-income ratio; job stability; documentation requirements; lien status; loan purpose; property type; and relative regional economic foreclosure risk. Economic risk is based on forecasts of expected foreclosure rates, housing starts, and unemployment to reflect current conditions of a particular region. Drivers of LS include LTV, regional economic factors, the value of the home at the time of default, and the time and expenses associated with the foreclosure and sale process.

To calculate an LS for a mortgage loan, Fitch utilizes regional home price forecasts and market value stress scenarios. Fitch, along with the econometric forecasting group Economy.com, has developed a system of econometric models that are used to forecast single-family home prices. Analysis of regional economic conditions, such as employment growth, financial market performance, demographics, housing starts, home price equilibrium trends, and bubble pricing are combined with historical home price data to generate home price forecasts. These are rolled up into six stress scenarios for each of 80 regions tracked by Fitch. MVDs are increased for non-owner-occupied properties, non-single-family properties, very low valued properties (less than or equal to $50,000), and high value properties (greater than six times the median property value for the region), reflecting volatility in the values, which often results in increased LS.

LS is determined on a loan-level basis by first reducing the property value by the appropriate MVD. In addition, a quick sale adjustment is made to reflect the distress sale of the property. Foreclosure and carrying costs are then subtracted, and any liens senior to the subprime mortgage are deducted to determine what amount, if any, remains to cover the loan balance. The cost of interest advancing is a function of the borrower's interest rate and the property location. Foreclosure timelines are broken down by state and are consistent with those employed by Fannie Mae and Freddie Mac. Foreclosure costs on first mortgages generally are assumed to be from 10%–15% of the outstanding principal balance of the loan.

The loss expectation for each loan is calculated within each rating category according to the following formula:

$$\text{Expected Loss}_{Loan} = \text{FOF}_{Loan} \times \text{LS}_{Loan}$$

For a portfolio of mortgages, the loss expectation at each rating category would be calculated as follows:

$$\text{Expected Loss}_{Pool} = \sum (\text{Expected Loss}_{Loans})$$

Structural Analysis

Subprime loans usually have higher coupons than comparable prime loans to compensate lenders for the increased default risk associated with subprime borrowers. Excess spread refers to the additional interest cash that is created from the interest revenue on the mortgage loans less financing costs, such as bond coupons, servicing fees, and trustee fees. Many subprime mortgage loan securitizations take advantage of this excess spread by applying it toward potential losses incurred from borrower defaults. Excess spread usually is used in two ways. Monthly losses are reimbursed to the senior noteholders by paying an equal amount of available excess spread as principal, and if the current monthly losses are less than the available excess spread, the extra cash may be used to pay additional principal to the senior noteholders, thereby building overcollateralization.

Since a number of variables affect the amount of excess spread over time, scenarios that stress each of these variables allow the rating analyst to more realistically value excess spread over the life of the transaction. These variables, further discussed below, include losses, prepayments, and interest rates.

Losses

Based on extensive mortgage loan pool history, Fitch has developed a loss curve for a typical pool of subprime mortgage loans that is shown in the chart on page 9. Individual loan losses usually are not fully realized until the underlying property is liquidated, and foreclosure proceedings are lengthy in many states. However, loans with junior liens or small balances may be written off after 180 days, and early payment defaults in nonjudicial states (associated with shorter foreclosure timelines) may result in losses by month seven. As a result, Fitch assumes that losses start in month seven, ramp up to a peak in months 28–42, and end at month 120.

Prepayment Speeds

Since residential mortgage loans may be prepaid by the borrower, if a larger than anticipated portion of borrowers in a mortgage loan portfolio prepay their loans, the amount of interest coverage available to cover losses will be lower than originally anticipated.

**Fitch Ratings Subprime Mortgage Loan Default Curve**
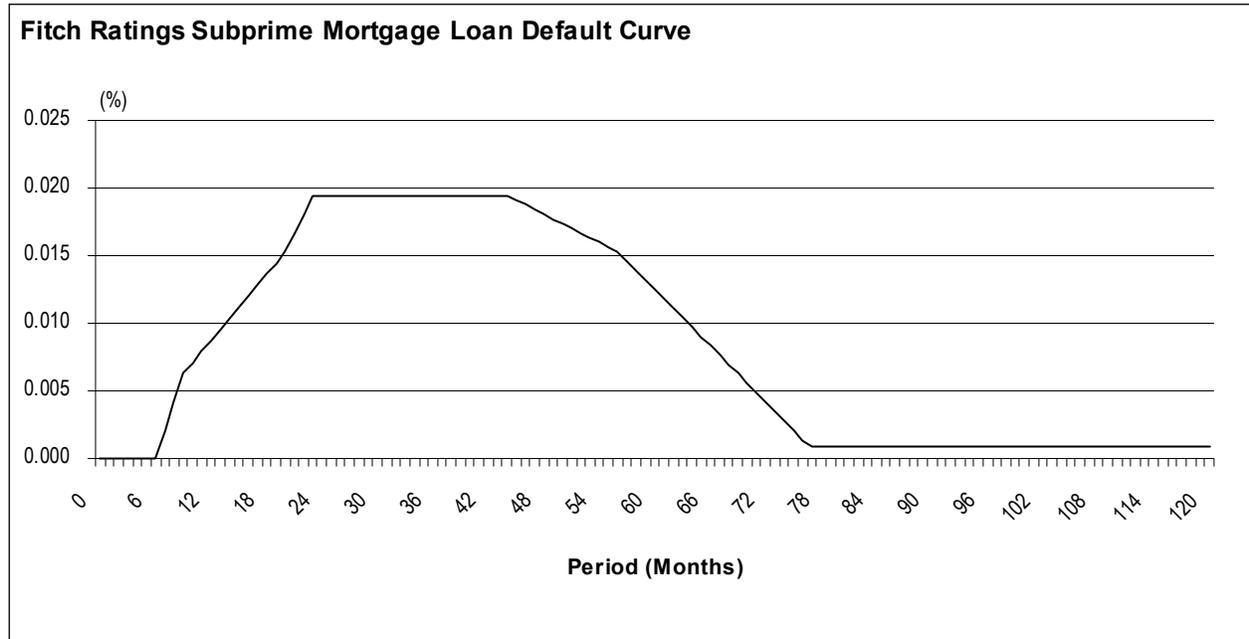
Therefore, varying levels of prepayments must be factored into the credit analysis.

Based on industrywide historical performance, Fitch has developed multiple prepayment curves by product type, including fixed, six-month LIBOR, two-year, three-year, and five-year hybrid ARM loans with and without prepayment penalties for each. Fixed-rate speeds without prepayment penalties ramp up to a 35% conditional prepayment rate (CPR) over 12 months and flatten out at 31% after month 30, while the hybrid

ARM curves ramp up from an 8% CPR to 82% by the reset dates. In general, Fitch's CPR curves with prepayment penalties run 20%–25% slower.

Interest Rate Mismatch

In addition to prepayment and loss scenarios, the impact of interest rate mismatch must be evaluated. For example, if the mortgage loans have fixed-rate coupons and the issuer plans to issue floating-rate bonds based on one-month LIBOR, a mismatch would be created. In this case, LIBOR movement

Fitch Ratings Upward LIBOR Stresses

LIBOR – London Interbank Offered Rate.
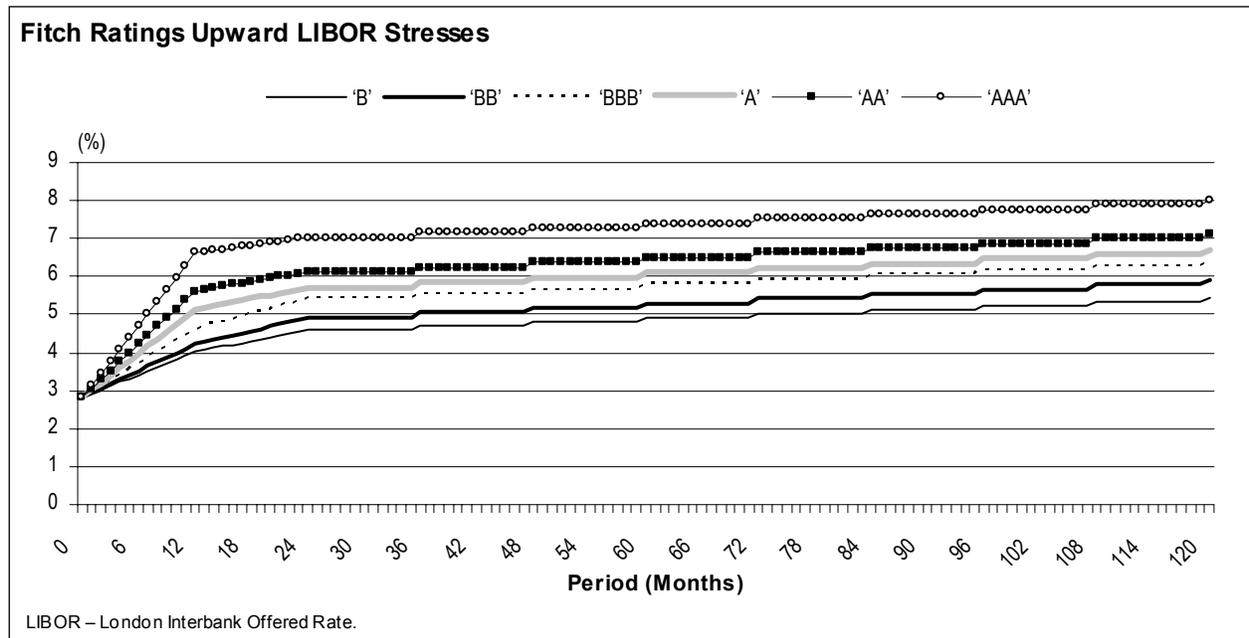
scenarios would be modeled to test the strength of the deal structure to withstand such movements. In the 'AAA' upward scenario, LIBOR is increased from the then-existing one-month and six-month LIBOR by 520 basis points. The first 420 basis points are applied over the first 24 periods *(see Fitch Ratings Upward LIBOR Stresses chart, page 9)*.

The combination of Fitch stress scenarios of borrower default rates, home prices, and interest rates yields the credit enhancement requirements for each rating category. Given the collateral trends discussed below, combined with rising rates and the prospect of slowing of home price growth, Fitch's credit enhancement levels have been trending upward *(see chart, page 11)*. This additional enhancement for Fitch-rated transactions should help protect both RMBS and CDO investors from possible deterioration in subprime mortgage performance.

■ Recent Trends in Subprime Mortgage

Recent trends in the subprime mortgage sector include the emergence of IO loans, increased concentrations of lower documented loans or stated income loans, and junior lien loans. In addition, predatory lending continues to be a focus. IO loans hit the subprime mortgage scene in 2004, moving to roughly 25% of total subprime production, with concentrations for specific issuers reaching as much as 60%. The product is designed to allow a borrower to make IO payments for a fixed period of time ranging from two to 10 years, depending on the lender. The majority of IO loans, approximately 60%, have five-year IO periods, while 30% have two- or three-year IO periods. The remainder carry 10-year IO periods. IO loans effectively lower the monthly payment and may allow the borrower to qualify for a larger loan than would be possible with a conventional fully amortizing loan. The large majority of IO loans, up to 70%, are originated in California. This is attributable largely to California borrowers seeking ways of affording housing in a market experiencing strong HPA. More recently, Fitch has observed some geographic diversification in this product type.

Since there is payment shock associated with this type of loan, when the principle payments begin, Fitch assumes higher default rates. Currently, Fitch assumes 11% higher FOF assumptions than for conventional subprime mortgage loans to capture the additional payment shock risk. Loss severities for IO loans also are higher due to the lack of amortization.

In another effort to address affordability due to strong HPA in certain regions, Fitch has observed an increase in LTVs. The weighted average LTV was as low as 76.5% for collateral securitized in vintage 1997 and reached just greater than 80% for vintage 2004. There also has been an increase in junior lien loans, which increases the overall combined LTV associated with the loan.

While borrowers look for ways to keep up with home prices and lenders offer options like IO loans, second-lien loans, and, most recently, 40-year amortization loans, origination of lower documentation or stated income loans continues to rise. Stated loans are loans where a borrower's income and/or assets are not verified by the lender. These loans represented 18% of collateral backing securitizations during vintage 1999 and have reached 36% for vintage 2004. Fitch's FOF assumptions for these borrowers are approximately 30%–50% higher than baseline expectations.

Predatory lending legislation continues to evolve. More states, including Massachusetts and Indiana, passed uncapped assignee liability regulations in 2004, which may result in significant liability costs if a loan is deemed to be illegal. Fitch continues to review lender procedures and controls designed to prevent predatory or high-cost loan originations. Also, Fitch increases its overall loss expectations and looks to strong representations and warrants to address this issue.

Although some trends in collateral attributes have increased risk in the sector, other factors help to offset or mitigate this risk. FICO scores have increased to 626 for vintage 2004 from a low in vintage 2000 of 602. In addition, low-balance loans typically associated with high loss severities have fallen to less than 2%, compared with 5% or more in prior vintages. Furthermore, it is rare to see concentrations above 2% of MH loans in subprime RMBS transactions. Prior to 2002, it was not unusual for subprime RMBS transactions to include in excess of 5% MH loans. However, most importantly, credit enhancement levels for subprime RMBS transactions have been increasing steadily.

The chart on page 11 shows credit enhancement in the form of subordination plus overcollateralization from January 2002 through December 2004 for 'BBB' rated subprime RMBS. As can be seen in the chart, credit enhancement has been increasing steadily due to a combination of factors. MVD assumptions have risen due to potentially overheated markets in specific

'BBB' Rated Subprime RMBS Subordination and Overcollateralization

RMBS – Residential mortgage-backed securities.
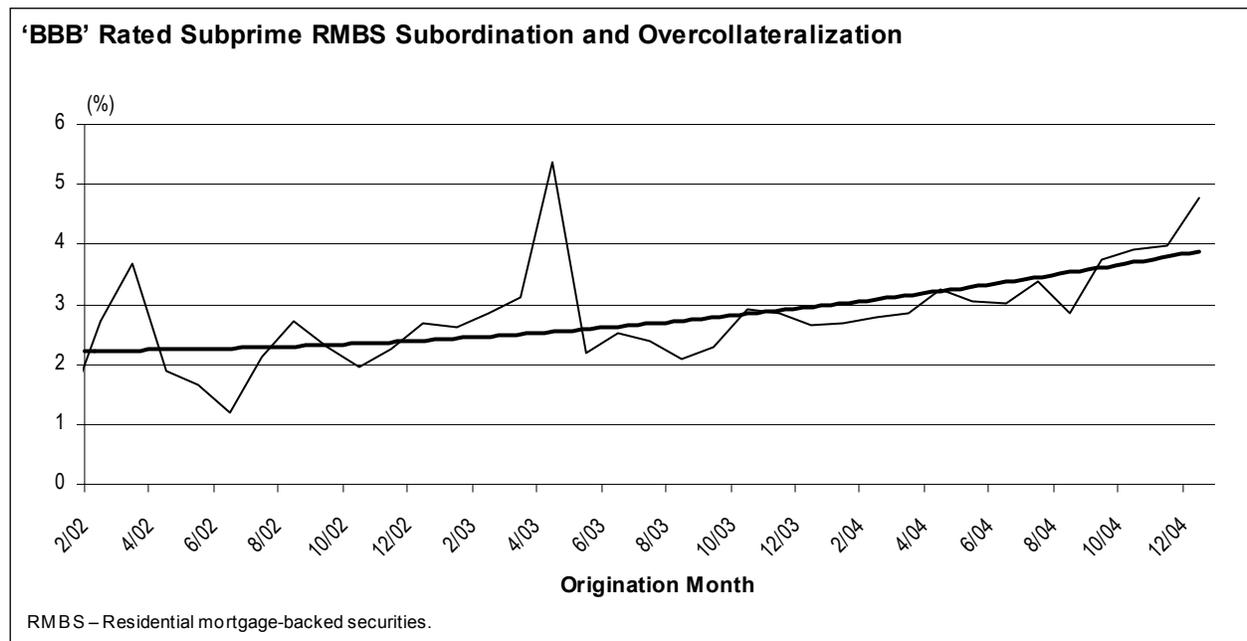
regions. Additionally, interest rate stresses have increased because of the potential reduction in the amount of excess spread available to cover losses in a rising rate environment. Finally, the increase in loan types with a higher risk of default, such as IO loans and stated income loans, increases Fitch's loss expectations.