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RESEARCH

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Commercial Mortgage-Backed Securities

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A Guide to Commercial Mortgage-Backed Securities

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Commercial mortgage backed securities (CMBSs) have emerged as an important market sector since 1996. With more than \$250 billion of outstanding issuance the CMBS sector has developed a broad investor base and a liquid secondary market.

This report provides a description of commercial mortgage securities, discusses the credit analysis and rating methods of the rating agencies, discusses CMBS relative value, and provides investors with some suggested analysis techniques. Salient points include the following:

- **Pooled commercial mortgage security payments to investors depend primarily on the cashflow generated from the underlying commercial properties, rather than on the credit of an issuer or borrower.** The current strength of this security is best reflected through the debt service coverage ratio (DSCR). Strong commercial property fundamentals and the long amortization terms of many commercial mortgages (typically 25 to 30 years) have made near-term loan defaults infrequent. To analyze final balloon repayment risk, investors and rating agencies focus on the expected balloon mortgage balances at maturity and possible refinance market conditions at that time using the property's loan-to-value ratio (LTV).
- **The rating agencies' credit enhancement models appear to provide excess credit protection relative to the default and loss experience of the latest real estate recession.** The rating agencies have developed methods for measuring the likelihood that a particular commercial transaction will meet its scheduled payments to investors under various economic scenarios. These methods focus on financial leverage statistics, as well as on underwriting standards, property types, and property tenancy. During the past four years, rating agencies have adjusted the commercial models to compensate for the strong collateral performance and more realistically reflect the commercial property default probability. **We expect that the rating agencies' commercial credit enhancement levels will continue to decline as the CMBS market experiences an economic slowdown and gains maturity.**
- A relatively low level of construction funding, in combination with the economic expansion of the past few years, has created strong commercial real estate fundamentals. **Seasoned CMBS transactions offer significant relative value because the underlying collateral has experienced significant appreciation since the loans were securitized, and yet, the loans remain immune from prepayment by strong prepayment penalties.**
- **Relative-value analysis of other spread products suggests that CMBSs offer significant excess return.** Considering the CMBS market's improved liquidity over the past 24 months and given similar credit risk to other rated structured debt products, CMBS seem to have collateral structure and market characteristics that justify a tighter overall spread (this is especially true for the triple-A rated classes including IOs).

A Description of CMBSs

A commercial mortgage security is backed by the cash flows of a mortgage or pool of mortgages on commercial real estate and may take a variety of different structural and legal forms. For purposes of this report, we focus on those securities that are backed by pools of performing commercial mortgages.

The structure of a commercial mortgage security (not the underlying loans) is quite similar to that of its single-family, residential counterpart. Principal and interest payments on underlying loans, after the deduction of servicing expenses, are passed through directly to the certificate holders in sequential payment order. Similar to residential securities, excess interest payments are bundled and sold as IO certificates. However, the cash flow of a CMBS IO certificate is more certain than that of residential IOs because the underlying commercial mortgages are usually locked out from prepayment for a portion of the loan term, and then the loans often have a high prepayment penalty or a defeasance mechanism. Unlike an agency residential mortgage security, CMBSs have no built-in implied government guarantee for the payment of principal and interest to the investor, making them similar to nonagency residential mortgage securities. **The bond's payment stream depends on the cash flows produced by the mortgage pool and the refinancability of the mortgages at their balloon maturity.** Figure 1 summarizes the major differences between commercial and residential mortgage bonds.

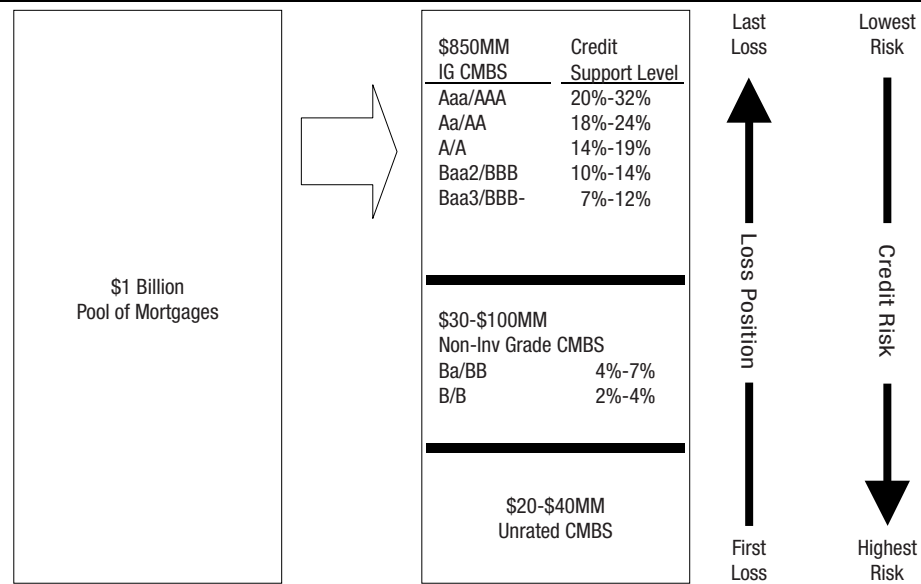
Figure 1. Commercial Mortgage Loan Versus Single-Family Loan Characteristics

Loan Characteristics	Commercial	Residential
Recourse	Nonrecourse to the borrower.	Recourse to the borrower.
Call Feature	Usually noncallable for the life. Loan prepayments usually permitted via defeasance.	Prepayable at par without penalty.
Security	Secured by income-producing assets (office building, retail property, hotel or multifamily).	Secured by single-family residential properties.
Structure	Bullet structure — typically ten-year balloon payments based on a 25- to 30-year amortizing schedule.	Fully amortizing — typically 15 or 30 years.

Source: Salomon Smith Barney.

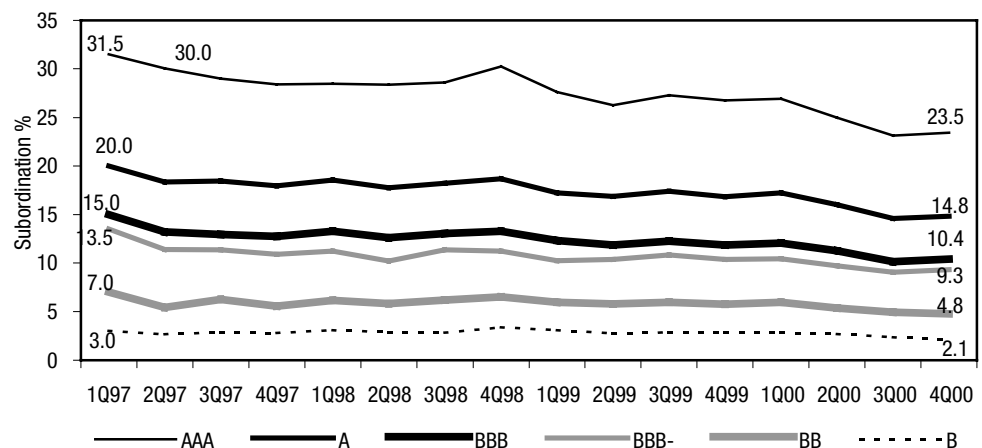
The triple-A class usually receives all loan prepayments or recoveries first.

The commercial mortgage security is structured with credit enhancement to protect against potential cash flow delays and shortfalls. This credit enhancement usually takes the form of internal support via allocation of loan losses in reverse sequential order. Loan prepayments (including any loan liquidation recoveries) are usually applied to the senior-rated classes first. Figure 2 presents a typical CMBS sequential pay structure. Some floating-rate CMBS structures may allocate principal prepayments based on a pro rata class allocation to allow for a higher likelihood of prepayment on a less diverse mortgage pool or the possibility that most of the high-quality loans prepay first.

Figure 2. CMBS Certificate Structure with Typical Subordination Levels

Source: Salomon Smith Barney.

Figure 2 also highlights the typical credit enhancement level to protect investors in a fixed CMBS conduit transaction. Early 1996- and 1997-era CMBS transactions usually featured credit enhancement levels of 30% at the triple-A level (70% of the transaction was rated triple A), while recent 2000 transactions have had triple-A subordination levels below 24%. Figure 3 presents historic CMBS credit enhancement levels.¹ Nonetheless, recent commercial transactions have featured credit enhancement as much as two to three times greater than that in residential mortgage securities.

Figure 3. Average Fixed-Rate CMBS Conduit Credit Enhancement Levels

Source: Salomon Smith Barney.

¹ See *CMBS Subordination Levels: Whatever Happened to 30%, 20%, 10%?*, Darrell Wheeler, Salomon Smith Barney, October 12, 1999.

Later in this paper, once we fully review the credit enhancement process, we discuss the adequacy of the credit protection contained in current CMBS transactions.

Loan Servicing and Advancing

Monthly mortgage debt service payments for CMBSs are collected and aggregated by a “master servicer.” On a set monthly date this master servicer remits the payments to the trustee, which makes the monthly payments to the certificate holders. If a loan defaults, certificate holders are insulated from possible short-term cash flow shortfall by the master servicer, which is obligated to make bond principal and interest advances to the trustee and pay property taxes and insurance payments to the extent that such advances are recoverable from the underlying mortgage obligation.

The special servicer is often an entity related to the subordinate certificate investor, providing an additional motivation to minimize the loan's losses.

The “special servicer” is a separate entity from the master servicer and is responsible for loan collections on defaulted loans. Any loan that has been in default for more than 60 days is usually transferred to the special servicer, which has an obligation to work out the loan with the objective of maximizing “the net present value of the proceeds realized from the loan.” The special servicer is often an entity related to the subordinate certificate investor, providing an additional motivation to minimize the loan's losses. The special servicer usually has extensive commercial real estate expertise, enabling it to evaluate whether to foreclose and liquidate the loan or to restructure the loan to enable it to be returned to the master servicer. During the loan workout, certain trigger events require the special servicer to obtain a new appraisal for the property. Usually, if the appraisal suggests that the property is worth less than 90% of the outstanding loan balance and servicer advances, the special servicer must reset the principal loan amount to the new appraisal value. This is referred to as an appraisal reduction. This appraisal reduction is meant to preserve capital for the senior-rated certificates, as it no longer makes sense to continue advances to the junior classes that no longer have an economic interest in the loan.

The agreement and mechanics of how each CMBS transaction's cash flows are handled are outlined in a pooling and servicing agreement between the issuer, servicer, special servicer and trustee. This agreement is intended to make every element of converting the mortgage's cash flow to bond cash flow very mechanical and is summarized in the prospectus.

The Typical Commercial Mortgage

Commercial mortgages differ from single-family residential loans in several ways. Commercial mortgages are backed by income-producing properties, such as office buildings, retail shopping centers, multifamily apartments, industrial/warehouse properties, and hotels. In 2000, the average fixed-rate conduit had the following property composition: 29.76%, multifamily loans; 14.3%, anchored retail; 10.1%, other retail; 18.5%, office; 6.6%, industrial; 8.0%, hotels; 2.1%, healthcare; and 2.4%, manufactured housing. The mortgages on such properties tend to have shorter stated maturities than their residential counterparts. Moreover, many of the commercial mortgages are either nonamortizing or partially amortizing and, hence, mature with a significant outstanding principal balance or “balloon.” In addition, commercial mortgages are larger-sized loans, ranging in size from \$300,000 to several hundred million dollars. Finally, commercial mortgages, particularly industrial/warehouse properties, may be subject to more environmental risk than single-family properties.

The typical commercial mortgage is a balloon loan, with a 30-year amortization schedule and a balloon payment due after ten years. Unlike residential mortgages, most fixed-rate commercial loans have very strong call protection (or lock-out) on prepayments for several years and then a prepayment penalty or defeasance for several more years. The mortgage loan may be structured to offer prepayment flexibility via three mechanisms that are designed to maintain the collateral pool’s cash flow or to compensate the investors for lost payment:

- 1 **Yield maintenance**, which makes the lender whole for the loss of an above-market coupon on a net present value basis (so that in effect there is generally no economic incentive for the borrower to refinance);
- 2 **Defeasance**, which involves the borrower pledging to the holder of the mortgage US Treasury securities whose cash flows equal or exceed that of the mortgage; or
- 3 Rarely, a **declining fee** proportional to the remaining balance; for example, a “5-4-3-2-1” schedule means that the penalty is equal to 5% of the outstanding loan balance in the first year of the penalty period, 4% during the second year, and so on.

Commercial borrowers will prepay and incur prepayment penalties if there is excess equity in the property to cash out.

An owner may make a voluntary prepayment and incur the yield maintenance or defeasance cost if they have a compelling necessity to sell. In the case of yield maintenance, the fee is usually distributed via a formula that will maintain each certificate’s return and usually enhances the IO return. In many instances, the early repayment may actually increase the IO holder’s yield. In the case of defeasance, the US Treasury collateral remains in the trust and the bondholders receive their regular monthly mortgage payments. Certificates from pools that have had a significant number of loans defease are good candidates for rating agency upgrades as the underlying loan collateral has been replaced with US Treasuries.

The intent of these prepayment restrictions was to create securities with low loan prepayment expectations to maximize cash flow certainty. A typical 1997- or 1998-era CMBS transaction would be MCFI 1998-MC3, a \$908 million deal priced by

Salomon Smith Barney in December 1998. At the time of issuance, virtually all (more than 99%) of the loans were balloons, the majority having the balloon payment due after ten years. All of the loans have restrictions on prepayments: about 98% have a lock-out period followed by either yield maintenance (about 78% of the loans), defeasance (19% of the loans), or a declining fee schedule (just under 1% of the loans). The remaining 2% of the loans have a prepayment penalty equal to the greater of yield maintenance or 1% of the unpaid principal balance; for some loans, this is followed by a declining fee penalty schedule. However, since 1998, prepayment restrictions on most CMBS have relied heavily on defeasance with many recent CMBS pools having all loans locked out until three months prior to maturity only permitting mortgage prepayments via defeasance.

Restrictions on prepayments usually end about three to six months before the balloon date, referred to as the free or open period. The objective is to allow the borrower time to refinance the loan and, hence, make the balloon payment. Later in this report, we will discuss how CMBS mortgage prepayments affect pricing scenarios.

The borrower on larger mortgages (more than \$1 million) is usually structured as a special purpose entity (SPE) to insulate the property's cash flow from the parent company. The SPE is usually restricted via covenants to only owning and operating the property and prevented from incurring further liabilities. Often, on larger loans (more than \$2 million), the SPE will have a special legal opinion that says it is separate from its parent's operating activities (bankruptcy remote) in an effort to prevent the loan from being involved in any bankruptcy proceeding that might evolve from a future troubled parent company. The loan may also have an independent director as an additional safeguard to prevent fraudulent bankruptcy filings by the SPE.

Commercial mortgages usually require the borrower to fund an escrow account with one month's payment of debt service, as well as ongoing reserves for real estate taxes and property insurance. On many commercial tenanted mortgage loans there may also be an escrow reserve amount for future releasing costs such as tenant inducement payments or leasing commissions. The borrower will also likely be required to provide annual financial statements and tenant rent rolls to enable the servicer to monitor property performance. The servicer usually uses these statements to recalculate the loan's debt service and makes that information available to certificate holders, via the servicer's web site.

Market Development

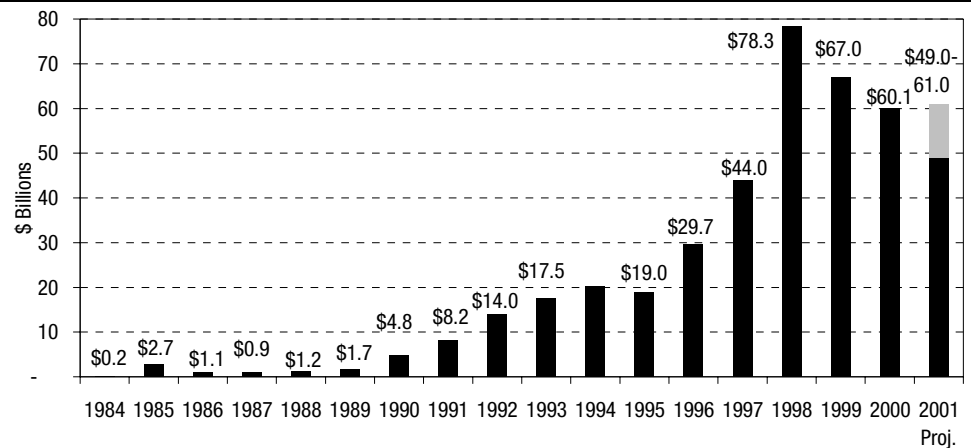
Prior to the early 1980s, a market for trading commercial mortgages existed, but it was limited and the loans were typically not sold in security form. Instead, financial institutions would trade such loans among themselves either as whole loans or as commercial mortgage participations.

In the mid-1980s, however, commercial mortgage originators began to utilize the securities market, albeit slowly. A few insurance companies turned to the Eurobond market, where they issued securities that carried S&P ratings based on the credit of the respective insurance company. The primary benefit that they received from issuing in the Eurobond market was that they faced no Securities and Exchange Commission (SEC) registration requirements. Securitization in the domestic market also began in the mid-1980s, helped partly by the development of the collateralized mortgage obligation (CMO), the introduction of the rating criteria for certain commercial mortgage transactions, and the Tax Reform Act of 1986, which authorized a new mortgage security vehicle known as a Real Estate Mortgage Investment Conduit (REMIC).

The first pooled commercial mortgage security was issued in 1984 — a \$205-million CMO issued by Penn Mutual Life Insurance Company. In 1985, estimated issuance of pooled commercial mortgage securities totaled a healthy \$2.7 billion. Issuance slowed thereafter, however, totaling approximately \$10.5 billion in cumulative issuance by year-end 1991 (see Figure 4). Compared with the single-family market, where roughly 50% of outstanding mortgages are securitized (representing about \$1.3 trillion), the proportion of securitized commercial mortgages initially was quite small.

It wasn't until the real estate recession of the early 1990s that CMBS issuance increased. The Financial Institutions Reform, Recovery and Enforcement Act (FIRREA) of 1989 was the catalyst for the CMBS market, because it chartered the Resolution Trust Corporation to manage and resolve insolvent thrifts formerly insured by the Federal Saving and Loan Insurance Corporation (FSLIC) and placed in receivership. FIRREA also included new regulations, making it more onerous for savings institutions to hold certain amounts of commercial real estate loans. The new capital standards required savings institutions to maintain total regulatory capital equal to 7.2% of their total risk-weighted assets in 1992 and at least 8% thereafter. Under FIRREA, commercial real estate loans held by commercial banks and thrifts had a 100% risk-weighting classification.

In addition, the 1989 Act imposed categorical asset restrictions on savings institutions, limiting secured nonresidential real property loans to 400% of regulatory capital. The new requirements were onerous for many thrifts, which were forced either to liquidate commercial mortgages or, at a minimum, to curtail originating them. Figure 4, which shows CMBS issuance since 1984, demonstrates the large increase in CMBS issuance that took place after 1990.

Figure 4. Pooled Commercial Mortgage Pass-Throughs and CMBSs — Estimated Issuance, 1984–2001P (Dollars in Billions)

P Projection.

Source: Salomon Smith Barney.

The CMBS market evolved a strong secondary market only after 1998.

Early issuance was driven by weak real estate markets, rising loan losses, and the RTC's need for an efficient loan exit strategy. Over the years, sourcing of CMBS issuance collateral has moved from RTC distressed loans to commercial mortgages specifically originated and warehoused for securitization. Early annual issuance levels were low. **It was not until 1997 and 1998 that outstanding issuance was sufficient to justify third-party reporting services and dealer secondary trading efforts, which have since increased liquidity and enabled relative value comparisons with other debt products.** Today's CMBS market has evolved to include a variety of CMBS pool types. Figure 5 summarizes the various CMBS classifications that are based on pool loan diversity.

Figure 5. Major CMBS Pool Types

Transaction Type	Market Size (MM)	Description
Regular Conduit	\$96,300	Pool containing more than 50 loans, usually with no one loan representing more than 10% of the total balance.
Fusion	\$49,236	Pool containing fewer than 50 loans with one loan representing more than 10% of the pool.
Large Loan	11,913	Pool containing less than 30 loans with several loans each being more than 10% of the total pool balance.
Single Asset/Single Issuer	21,023	Pool collateralized by a single asset or a pool of assets all owned by the same entity. Usually a low-leverage loan that the rating agencies can give an investment-grade rating on a stand-alone basis.
Floating-Rate Conduit	25,100	Pool collateralized by any number of loans with mortgages paying based on a floating-rate benchmark.

Source: Salomon Smith Barney.

Figure 6 presents recent historic issuance sorted by these different product categories. The most notable change is the decline in fixed-rate transaction size, which has dropped by 16% for conduit transactions and 23% for fusion transactions. We expect that fixed-rate issuance size will remain above \$750 million in the future because smaller transactions hurt issuance economics.

Figure 6. CMBS Issuance, 1999 and 2000 (US Dollars in Millions)

Type	1999				2000			
	Total	Pct. of Total	Average Size (\$MM)	No. of Deals	Probable Forecast	Pct. of Total	Average Size (MM)	No. of Deals
Conduit	\$29,319	43.7%	\$887	33	\$22,995.4	38.3%	\$766.51	30
Fusion	7,765	11.6	1,294	6	5,256.9	8.8	1,051.38	5
Floating Rate	5,510	8.2	662	8	10,940.7	18.2	607.81	18
Single Borrower	7,078	10.6	413	17	5,238.8	8.7	238.13	22
Other	6,236	9.3	338	18	2,689.9	4.5	537.98	5
Lease Backed	1,262	1.9	228	6	109.7	0.2	109.69	1
Large Loan	—	0.0	—	—	949.9	1.6	237.48	4
International	9,847	14.7	308	31	11,890.1	19.8	371.57	32
Total	\$67,018	100%	\$557	119	\$60,071.3	100%	\$513.43	117

Source: *Commercial Mortgage Alert* and Salomon Smith Barney.

Today's CMBS market is supported by a broad array of institutional investors that hold CMBSs to diversify their bond portfolios. New institutional investors continue to recognize the benefit of the underlying asset diversity and credit enhancement structure. **This wider investor base has combined with strong underlying collateral fundamentals to create an asset class that has become a capital safe haven in times of economic distress. The market has evolved to the point where several hundred million CMBS certificates can be bought and sold in minutes at bid/ask spreads of 1bp or 2bp for triple-A certificates.** The liquidity in triple-A CMBS (75% of the issuance) is similar to that of agencies and less like that of many other structured debt products. Much of the liquidity has been driven by the rating agency diversity guidelines and B-piece investor reviews, which have formed homogeneous pools and attracted more investors to CMBSs. **If the secondary CMBS market continues to experience the strong secondary market that has existed since 1999, we feel that CMBS spreads can tighten further relative to the liquid agency debt product.**

Commercial Loan Evaluation and the Rating Process

The rating agencies have developed analytical models that take much of the investigative onus off the investor. After extensive analysis, the agencies provide investors with a consistent measurement of the likelihood that cash flow from underlying mortgages will be sufficient to meet scheduled payments of principal and interest on the security at each certificate rating. At higher rating levels, mortgage cash flows are expected to hold up under increasingly severe economic conditions. Thus, for a given pool, progressively greater credit support is needed at higher rating levels. **When the rating agencies initially developed their models the real estate market was emerging from a severe recession, the commercial mortgage market suffered from a lack of standardization, and there was a shortage of historical delinquency and foreclosure data. As a result, the rating agencies developed subordination models based on very conservative default and loss assumptions.**

The process used to rate commercial mortgage securities is, in some respects, similar to the residential mortgage rating process: the primary focus of the analysis in each case is on the credit quality of the underlying collateral; however, significant differences exist. Commercial mortgages are nonrecourse loans, so securities are backed only by income-producing properties whose profit-oriented owners' motivation depends on different factors than those affecting a residential homeowner. Of primary concern in analyzing a commercial mortgage is the property's underlying net operating income (NOI) and net cash flow (NCF), and all factors that influence them. Therefore, an analysis of the credit quality of a commercial loan requires a careful review of underlying tenants' creditworthiness, the structure and term of underlying leases, the historical level of vacancies and rents on the property and on other properties in the region, and the real estate and economic cycle within the local market. All of this analysis feeds into a review of the mortgage's loan-to-value ratio (LTV) and debt service coverage ratio (DSCR).

In reviewing a property's cash flow, a rating agency will typically reduce the property's cash flow to the lower of the rental market or the contractual lease rent. A higher contractual rent may be accepted as cash flow if the underlying tenant is publicly rated and the term of the lease extends beyond the term of the mortgage loan. The property's occupancy may also be adjusted downward to reflect surrounding market conditions on the assumption that even a fully occupied building will eventually lose tenants and stabilize at the market occupancy rate. The property's operating costs are assessed at historic levels adjusted for inflation with any lower-than-market costs increased to reflect a third party's cost in anticipation of the possibility the mortgagee may have to foreclose and operate the property. The NOI, which is derived from revenues less operating expenses, is then further adjusted by estimated annual market releasing commission and tenant inducement costs that reflect the building's scheduled lease expiries and releasing costs for similar buildings. Finally, the agency subtracts a capital expenditure allowance in anticipation of ongoing structural repair costs that will not be reimbursable from tenants. The rating agencies' resulting NCF is usually 3%-5% less than the

underwriter's figure, but reflects an objective opinion of the property's likely ongoing cash flow in a stressed environment. Figure 7 illustrates typical property costs with summary comments on the typical rating agency adjustments.

Figure 7. Typical Cash Flow Underwriting Adjustments for a Commercial Property

Revenue	Mark to sustainable market (may be trailing 12 months or current annualized rent roll or current rent roll with above-market rents marked to recent market rates). May allow for above-market rents for rated credit tenants that expire beyond term. Rent roll and similar market lease comparables are analyzed to determine appropriate subject rental rate.
Vacancy	Market vacancy (subject to agency minimums of 5%-10% for various property types). In the case of lodging properties, the historic occupancy is assessed as a base.
Management Fees	Marked to market based on third-party independent cost to manage property.
Operating Costs	Historic figures inflated (review three years of historic figures).
Net Operating Income	Revenue less vacancy, management fees, and operating costs.
Tenant Allowance	Stabilized amount based on average turnover and recent concessions (subject to agencies' minimum standards). May exclude investment-grade tenants expiring beyond the loan term. Usually requires a separate reserve for any large single-tenant expiry.
Commissions	Average turnover times standard amounts (i.e. 2.5% for renewals, 5% for new).
Capital Expenditures	A structural reserve for items not recoverable from tenants. Usually based on the greater of engineer's report or agencies' standardized allowances (usually \$0.15-\$0.40 psf for retail and office and \$200-\$250 per unit for apartments).
Net Cash Flow	Net operating income less tenant allowance, commissions, and capital expenditure reserves.

psf Per square foot.

Source: Salomon Smith Barney.

Property Underwriting and Assessment Variables

Before reviewing specific rating agency methodology, we briefly discuss the loan underwriting variables considered in an analysis of commercial mortgage securities:

- Debt service coverage ratio
- Loan-to-value ratio
- Mortgage payment structure
- Mortgage amortization/term
- Tenancy
- Property location

DSCR is calculated as follows:

- 1 The current NOI on a property divided by the actual mortgage debt service obligation. This is the NOI DSCR, which is usually provided by the underwriter and reported on an ongoing basis by the servicer.
- 2 The estimated cash flow (after leasing costs and capital expenditures not recoverable from the tenants) divided by the actual mortgage debt service obligation.
- 3 The cash flow after leasing cost and capital expenditures not recoverable from the tenants divided by a stressed refinance constant (a debt constant that is higher

than the actual rate to account for potential unfavorable refinance conditions when the balloon comes due). This is referred to as a “stressed DSCR” and is used by rating agencies to perform their analysis.

LTV refers to the ratio of the outstanding loan balance on a property to the estimated valuation of that property. **LTV is assessed as an important indicator of potential loss severity, because the analysis of how much will be lost upon default relies heavily on the property value relative to the outstanding debt on that property.** Loss severity can also be affected by state foreclosure laws. If a state’s foreclosure laws could delay the mortgage servicer’s property liquidation, the agency may toughen the LTV parameters for that state. **The rating agencies treat DSCR as the best indicator of default probability, while LTV is viewed as the best indicator of loss severity.**

DSCR is considered an indicator of default probability, while LTV usually gives a good indication of potential loss severity.

Similar to the residential market, floating-rate structures in the commercial market are viewed as inherently more risky than fixed-rate structures. **The potential inability to meet undefined or floating debt service payments in the future increases the risk that the borrower may default.** The presence of a floating-rate lessens somewhat the reliance of the analysis on a DSCR. To compensate, rating agencies usually assess the loan’s DSCR at a higher debt constant, creating a lower DSCR that requires higher credit enhancement levels. If the borrower has the benefit of an interest rate cap agreement, the rating agency may recognize the contract’s benefit by using the contract interest rate to calculate DSCR. Furthermore, many floating-rate commercial mortgages are secured by buildings that are in a value enhancement stage, intensifying the default and refinance risks because cash flow may never stabilize. **Overall, floating-rate mortgages are viewed as more risky by the agencies and carry significantly more credit enhancement.**

Whereas most residential mortgages fully amortize over a 15- or 30-year life, many domestic commercial mortgage structures either are partially amortizing or do not amortize at all (interest only). Most carry shorter terms than residential mortgages, and a large majority mature with an outstanding balloon payment. From a credit perspective, fully amortizing mortgages are the least risky. As a loan amortizes, principal is paid down, reducing the indebtedness of the borrower and reducing the risk of default (equity buildup is an important protector against default in the commercial market, as well as minimizing loss severity). A partially amortizing loan will have paid down only part of its principal by maturity, and a nonamortizing loan will have paid only interest and no principal by maturity, translating into little or no equity buildup. Partial or no-amortization loans will mature with a significant remaining principal balance — a “balloon payment” — that must be made. For example, after ten years of amortization a loan has usually only paid 15% of the principal, if the loan is on a 30-year amortization schedule. Typically, the borrower will try to refinance that balance into a new mortgage, creating refinancing risk in the credit equation.

Various factors may impair the borrower’s ability to refinance the remaining principal at maturity:

- 1 An increase in interest rates

- 2 A decline in property value
- 3 More restrictive underwriting criteria
- 4 A relatively large number of vacancies
- 5 Tight credit conditions

All, or any of these factors, may inhibit lenders in the primary market from providing refinancing on the mortgage. Given this potential risk, the rating agencies focus on the coupon rate of the mortgage and analyze the ability of the property to support a new mortgage in the amount of the balloon at a potentially higher interest rate level. **Moody's and Fitch use a maximum refinance interest constant for the collateral, which is typically 9.25% for Moody's and 8.88% to 11.33% for Fitch, depending on the property type and loan amortization to the balloon.**

These refinance constants are based on historic rates and reflect a worst-case DSCR. The resulting stressed DSCR is usually 0.10-0.15 times lower than the underwriter's DSCR. For reference, a typical CMBS transaction may have a NOI DSCR of 1.35-1.45, a CF DSCR of 1.20-1.40, and a "stressed DSCR" by an agency such as Fitch of 1.05-1.20.

The rating agencies also look at the expiration dates for major leases on the property relative to the maturity date of the mortgages to help determine vacancy potential and, thus, the releasing risk exposure that will be evident on the balloon date. If many leases expire near the loan maturity date, the loan will usually be structured to accrue a sufficient releasing reserve to mitigate the risk. To the extent the rating agencies perceive lease rollover risk, they will increase their probability of default assessment and sometimes decrease their specific estimated loan recovery, leading to higher subordination levels.

The rating agencies also take into account the structure of the loans to evaluate the level of credit support necessary to protect against balloon risk. In many cases, the loans may have an early permitted repayment date of ten years, after which the interest rate steps up and all cash flows are captured in a lockbox controlled by the lender to amortize principal (an anticipated repayment date (ARD) loan). The ARD loan structure provides a built-in loan restructuring, because after the anticipated loan repayment date, the lender receives all the property cash flow without having to foreclose.

The rating agencies also evaluate the flexibility of the servicer in situations where refinancing risk is present. The question of whether a workout will be attempted is an important one — in terms of whether a default will occur, and if it does, what the loss severity will be. Traditionally, commercial lenders have maximized recoveries when afforded flexibility in these loan workout situations. In some cases, they have extended the term of the mortgage; in other cases, they have reduced the monthly payments on the mortgage. While the servicer's ability to extend loans may lead to a maximum loan recovery, it also affects the certificate's average life and has an impact on the investor's yield if they paid a premium or a discount for their bonds.

Sometimes a forced foreclosure and cash sale of property will result in much higher losses than a workout negotiation whereby the current borrower is allowed to continue under new terms. In addition to a potentially low sales price, the expenses

incurred in a foreclosure are generally higher than those associated with a lender/borrower cooperative loan workout, particularly if the borrower uses bankruptcy as a delaying method. Even in cases where the underlying property does not support the outstanding loan balance, a reduction of the debt claim and avoidance of the above-mentioned expenses may result in higher recovery levels. Therefore, the ability of the servicer to manage a workout is a critical factor in minimizing potential loan losses. Such ability will be a function of servicer experience, knowledge of the local markets and of the pertinent property type, and finally, workout volume capacity. **As previously mentioned, most recent CMBS transactions give the special servicer the ability to modify loans subject to a standard of care to maximize expected loan net present value. Therefore, rating agencies assess the special servicer's abilities and may adjust the credit enhancement levels by 0% to 1% based on the evaluation.**

Finally, the viability of an income-producing property depends on its tenants and the property location's ability to attract replacement tenants. The loss of a major tenant can cause insolvency. **Most recent commercial mortgage defaults have been caused by either lease expiries or leases not being affirmed by a bankrupt entity.** Leases rolling over to lower market rents can create a lower DSCR and lead to defaults. Thus, rating agency models favor multi-tenanted buildings and, in addition, will look to the creditworthiness of the individual tenants, particularly the anchor tenant in a transaction backed by mortgages on shopping centers. Single-tenanted buildings are usually penalized with higher subordination levels to ensure that there is sufficient loss recovery should the individual tenant vacate and cause a default and loan liquidation. Tenant concentration may be somewhat offset by a strong property location and the resulting ability to attract new replacement tenants at low re-tenanting costs.

Rating Agency Model Mechanics

The number of mortgages in the pool and the relative size of the larger loans as a percentage of the pool are major determinants of agency subordination. This is the key reason that CMBS pools are classified by loan size. Smaller pools and pools with loan or borrower concentrations merit closer scrutiny, because they represent greater risk and, thus, require greater credit support.

As loan sizes increase, the agencies' loan size analysis can create an "add-on" to subordination of 0% to 4% for a diverse pool, 3% to 10% for a fusion pool and anywhere from 10 to 20% for a large loan pool or single asset transaction. The increase in credit enhancement generally steps up to ensure the default of a single loan concentration will not affect the rating of the pool. This lumpiness-requires-subordination approach, ensures that in the event of a random default of a large loan, the loan recovery will be sufficient to pay down the upper-rated classes and maintain the original relative subordination and credit rating. On more diverse pools the rating agencies rely less on the pool's ability to withstand an individual loan's default and

focus more on the pool's anticipated cumulative lifetime defaults being similar to the experience in the early-1990s default studies.²

Thus, the loan pool's size diversity decides whether the rating agencies use a property-specific approach (with the ratings based on each property's characteristics) or an actuarial analysis. **The actuarial approach relies on an evaluation of credit characteristics from a sample of the overall pool.** An analysis of pool credit quality through aggregate loan characteristics generally will be sufficient if the pool was originated with uniform underwriting standards, contains a sufficiently large number of loans, and the distribution of the loan balance is not widely skewed. To the extent any of these conditions is lacking, the rating agency may rely more on a loan-by-loan analysis.

To determine the loss coverage required on a commercial mortgage pool, each rating agency reviews a large sample (40%-60%) of the individual loans to assess the pool's cash flow underwriting and asset valuation by property type. This assessment of cash flow underwriting by property type is extrapolated to the entire pool to determine the DSCR and LTV characteristics. This leverage analysis is the core of the agencies' assessment — they feed the DSCR and LTV into a “base pool” loss matrix that produces a foreclosure frequency and loss potential of the loans at various rating levels. Thus, for a given LTV and DSCR, the rating agency's base matrix provides a foreclosure frequency and principal loss value.

The rating agencies view LTV as the key determinant of loss severity following loan default. To estimate collateral values used in the calculation of LTV, the rating agencies capitalize³ their estimated cash flow at yields that reflect property type, property-specific characteristics, and local market conditions. The rating agencies assess fixed and variable liquidation/workout expenses in the loss severity calculation. For smaller loans, fixed expenses can have a significant impact on loss severity. State foreclosure laws also affect loss severity. Accrued interest and deteriorating property performance will increase losses; the longer it takes for the mortgage servicer to gain control over the property and to liquidate it, the higher those losses will be.

In Figure 8 we present a generic example of how a rating agency matrix might translate debt service to an actual subordination level. For simplicity, the example is based on an early Fitch default and loss table, which has since evolved considerably.

² “Update to Commercial Mortgage Defaults,” Mark P. Snyderman, *The Real Estate Finance Journal*, Vol. 10, No. 1, Summer 1994.

³ One of the simpler commercial real estate valuation methods is to divide a property's expected cash flow by a required property yield. The required property yield is commonly referred to as a “cap rate.”

Figure 8. Loan Subordination, Using Default and Loss Matrix and Loan with 1.15 Times Coverage

Loan DSCR	Default Prob.	x Loss Prob.=	A Level Loss	A Level Enhance	Class Gearing	Initial Subord.=	+ Add-On Subord.=	Final Level
0.10	80%	40%	32.00%					
0.50	65	40	26.00	AAA	AA x 1.25	22.4%	6.3%	28.7%
0.80	55	40	22.00	AA	A x 1.28	17.9	5.0	22.9
0.90	45	40	18.00	A	A x 1	14.0	3.9	17.9
1.00	40	40	16.00	BBB	A/1.39	10.1	2.8	12.9
1.15	35	40	14.00	BBB-	BBB/1.125	9.0	2.5	11.5
1.25	32	40	12.80	BB	BBB/1.9	5.3	1.5	6.8
1.34	28	40	11.20	B	BBB/4.2	2.4	0.7	3.1
1.50	25	40	10.00					
1.75	20	40	8.00					

Source: Illustration using Salomon Smith Barney assumptions and Fitch DSCR Default and Loss Matrix.

Fitch has a matrix of different refinance constants based on historic loan interest rates for different property types, which it adjusts for loan amortization and other structural recovery features. All of the agencies supplement the DSCR analysis with a loan-to-value loss matrix, which accounts for the differences in property types by valuing the properties using property-specific capitalization rates. The loan in the example has a 1.15 times DSCR based on the rating agencies' assessment of cash flow and a higher-than-actual property specific debt refinance constant. The Fitch table assigns the 1.15 times coverage ratio a 35% probability of default with an expected loss of 40%.

Although this example assumes that each loan has a 40% loss severity, the agency would actually adjust the loss severity for LTV, loan amortization, and state foreclosure laws. In addition, the rating agencies capitalize their re-underwritten cash flow at a cap rate or property yield that they feel is sustainable for the specific property. After adjusting the cash flow and using a higher cap rate, the rating agencies' LTVs typically will be 15%-20% higher than the those of the underwriters. So, an underwriter's LTV of 65%-70% is usually assessed as an 80%-88% LTV by a rating agency. Typical rating agency loan loss expectations range from 30% to 50%, depending mostly on the agency's assessment of LTV. The Fitch default and loss variables were based on events during the previous recession, which Fitch considered an A-level recession (meaning any loan rated less than A leverage was expected to have defaulted). Thus, its matrix creates credit enhancement at the A credit level. **Therefore, the loan in the example that has a 35% chance of default times a 40% expected loss requires a 14% credit enhancement at the single-A credit level.** Fitch then gears that 14% credit enhancement up and down the credit classes based on gearing multiples that it estimates reflect an appropriate level of relative credit risk protection at each level.

To create their base default and loss matrixes, the rating agencies have had to make some generic assumptions about the underlying mortgage pool. **To the extent that the pool varies from the generic assumptions (or concentrations based on the grouping analysis) then the subordination levels are increased or decreased by an additional subordination "add-on."** In the above example, the "add-ons" are added to the initial loan's leverage credit enhancement to create the final loan's

credit enhancement levels. The subordination add-ons can be pool- or loan-specific features that differ from the characteristics considered in the default and loss matrix. If a loan deviates from the base pool characteristics, the rating agencies adjust levels by changing the loan's foreclosure frequency and/or principal loss. In Appendix A, we review the full list of pool characteristics that would cause each agency to adjust its overall credit enhancement levels (such as geographic concentration, underwriter quality, special servicer quality, property type, loan amortization, property quality, leasehold mortgages, secondary debt, environmental issues, and operating history).

Rating Agency Credit Enhancement Levels Provide Excess Protection

Figure 3 showed that CMBS credit enhancement levels declined from 30% in the second quarter of 1997 to 23.4% in October of 2000. Our original report, *CMBS Subordination Levels — Whatever Happened to 30%, 20%, 10%*,⁴ attributed two-thirds of the decline in subordination to improved underwriting, decreased leverage, and a declining proportion of volatile property types being underwritten in recent years. With most of the decline in triple-A subordination levels occurring in the past year, many investors are asking whether current subordination levels provide sufficient credit protection.

Since October 1999 we have made only a couple of adjustments to Salomon Smith Barney's subordination model. One model adjustment accounted for the amortization of the loan balance, a major change from determining the loss factors based on the loan balance at origination. We feel that adjusting for loan balance amortization is reasonable, given that loan defaults usually take place only after the mortgage has had time to amortize to some extent. The rest of the subordination level decline can still be accounted for by further improvements in the composition of loan pool property types and decreased leverage. **Overall, our original model, with the couple of adjustments, continues to match the rating agencies' levels, suggesting that there have been few other agency modifications caused by "agency competition."**

So, what has caused underwriters to drastically improve their underwriting standards over the past year, creating the improved subordination levels? The answer lies in the 1998 bond market crisis, during which many subordinate CMBS buyers were eliminated from the market, leaving a group of five or six buyers for the double-B, single-B, and unrated CMBS classes. With limited competition, these B-piece buyers have had tremendous buying clout and have been able to remove any questionable loans from CMBS pools and request that certain property types (such as limited service hotel) not be included. This has shaped underwriting standards and the pools' property composition.

The B-piece buyer clout is demonstrated in Figure 9 by the wider CMBS spreads that subordinate buyers have been able to achieve in recent years. The figure highlights the 67%-plus CMBS spread widening during the 1998 bond market crisis

⁴ *CMBS Subordination Levels — Whatever Happened to 30%, 20%, 10%?*, Salomon Smith Barney, October 28, 1999.

and the relatively small contraction in noninvestment-grade spreads since the crisis. This steepening of the credit slope between triple-A and unrated classes also developed in the investment-grade CMBS classes, with the credit spread between triple-B and triple-A CMBS classes still significantly higher than pre-crisis levels.

Figure 9. Ten-Year CMBSs — Spreads, 28 May 98, 8 Oct 98, and 29 Dec 00

	Pre-Crisis 28 May 98	Crisis 8 Oct 98	Percentage Increase ^a	Year-End 29 Dec 00	Percentage Decrease ^a
AAA	77bp	205bp	166%	143bp	30%
A	110	300	173	178	41
BBB	145	350	141	231	34
BB	265	550	108	535	3
B	460-540	840-900	74	840-900	0
Unrated Yield	15%-18%	25%-30%	67	25%-30%	0
Credit Curve					
BBB-AAA	68bp	145bp		88	
BB-AAA	188	345		383	

^a Percentage change based on the midpoints.

Source: Salomon Smith Barney.

Issuers now report that as much as 5%-10% of a pool may be removed (“kicked out”) from a transaction, usually based on leverage and property type. **This B-piece buyer screening is the major factor in improving underwritten pool quality, which has driven the decline in subordination levels.**

Evolving Rating Agency Models Reflect a Maturing Market

We classify the CMBS market as just at the end of its development phase, with the rating agencies frequently adjusting their models to account for improved loan structural features, the benefits of pool diversification, the stable real estate market, and additional data from CMBS transactions. The original rating agency models were based on the study of early-1990 life insurance company mortgage default and loan recovery rates. These underlying life insurance loans were significantly different from the structured mortgages currently placed in CMBS pools, leaving the rating agencies to estimate subordination measures for the new structural features. Given the untested nature of the CMBS market at this time, the rating agencies tended to use conservative default and loss assumptions when creating their first CMBS models. However, with today’s fundamentally strong commercial mortgage market, many investors and rating agencies now expect that the next economic slowdown will create a less severe real estate downturn. Considering the strong real estate market and conduit pool performance, it is not surprising that the rating agencies have decided to make small adjustments to their models.

We should caution that not all rating agencies may have changed their models, and yet, they may be able to match other rating agencies’ lower levels on recent transactions. Their models may not have changed mathematically, but rather their analysts may be interpreting the mortgage loan data with an eye to the strong markets and improving property values. **Overall, we believe that the contraction**

in rating agency subordination models reflects flexibility and the realization by the rating agencies that their initial models were too conservative in assessing some pool characteristics.

Investor Implications

But what are the implications of the declining levels for investors? Even with the 6% decline in triple-A CMBS subordination levels, CMBS pools can still withstand a high frequency of defaults and loss severity prior to experiencing a loss. The credit support built into 2000 CMBS transactions is well in excess of that found in high-risk mortgage security products (subprime or home equity loans).

To illustrate this point, in Figure 10, we analyze average 2000 CMBS subordination levels and the implied default rate at each credit enhancement level. To back out the implied default rate, we divided each subordination level by a 40% expected loan loss. As previously discussed, rating agencies use different expected loss rates, typically ranging from 30% to 50%, depending on their actual assessment of the underlying real estate. We felt the a 40% loss rate was conservative given the structural features of 2000 conduit mortgages and current, stable real estate market conditions. Specifically, we believe that the currently strong real estate market will make it less likely that borrowers will default, while professional servicing and the cash management structure of current conduit loans should limit future foreclosure loan losses.

Figure 10. CMBSs — Implied Default Rates at 40% Loan Loss

Class	2000 CMBS Class Credit Enhancement		Divide Level by Expected Loan Loss	=	Loan Defaults Required for Loss
AAA	24.61 %	/	40.0 %	=	61.5 %
AA	20.10	/	40.0	=	50.2
A	15.65	/	40.0	=	39.1
BBB	10.99	/	40.0	=	27.5
BBB-	9.61	/	40.0	=	24.0
BB	5.33	/	40.0	=	13.3
B	2.60	/	40.0	=	6.5

Source: Salomon Smith Barney.

Figure 10 demonstrates that an average 2000 mortgage pool experiencing a 40% loan loss on every default would require 39% of the loans to default before the single-A rated class lost any of its principal. Similarly, a 24% loan default rate is required for a triple-B-minus loss and a 61.5% loan default rate is required for a triple-A class loss.

It is helpful to compare the implied default rates to those in the 1994 Snyderman commercial default study.⁵ This study tracked 10,955 commercial mortgage loans, originated by eight insurance companies. The study observed a 13.8% default rate over a five-year period and projected an 18.3% lifetime default rate for the entire

⁵ "Update to Commercial Mortgage Defaults," Mark P. Snyderman, *The Real Estate Finance Journal*, Vol. 10, No. 1, Summer 1994.

pool. The study showed lifetime default rates that ranged from 7.6% to 21.5%, depending on the period studied, the originator, and the lifetime projection method. Therefore, it is clear that the investment-grade implied default rates in Figure 10 have a more than sufficient buffer when compared with the study's worst case lifetime default rate of 21.5%.

If we accept that a 40% expected loss is reasonable, then the projected default rates for triple-A through triple-B classes seem conservative relative to historical default data and projections for the next real estate recession. The realization that early credit enhancements models were tougher than current subordination calculations helps explain why most CMBS spreads have tightened significantly after only a couple years of seasoning. Investors looking at 2000 transactions should also take comfort from the fact that rating agencies have room to contract subordination levels further, possibly creating typical conduit CMBS levels with 20% subordination in the triple-A class. **Therefore, we expect that 2000 issuance will become another vintage subordination level year with the potential to season to tighter spreads. In contrast, we feel that double-B, single-B, and unrated subordination levels have declined as far as they can. However, double-B and single-B CMBS investors buy at a discount to par and typically receive a full return of their capital in the first few years of their investment.**

Collateral Fundamentals — Commercial Real Estate

Banks, real estate investors, and developers continue to watch for a real estate recession, mindful of the last real estate market meltdown in 1991. This cautionary approach to the real estate market has created a market in which speculative development is rare. US construction starts in office and industrial properties have not returned to the levels of the late 1980s because construction financing has been largely unavailable without significant preleasing.⁶ Another factor has been the dearth of liquidity in the recent marketplace. Although 1999 and early-2000 retail, multifamily, and hotel construction levels approached late-1980s levels, CMBS investors have demonstrated good market awareness and avoided transactions with large exposures to hotel, unanchored retail, and power centers.

We cannot project when the next real estate recession will occur, but we believe that whenever it does, it will be less severe than the previous one. Figure 11 compares vacancy figures for various real estate segments for 1991, 1999 and 2000. The current vacancy rates are better than they were just before the previous recession, and they suggest that if an economic slowdown were to occur in 2001, it would only marginally affect occupancies and rents. It would take a severe recession to have a significant impact on the current market, which is enjoying relatively low vacancy levels. These low vacancy levels are a direct outcome of the market's experience during the previous recession. At this stage in the economic cycle, we expect to see construction starts for office properties — which are in short supply — continue to rise, while starts for other property segments have already started to decline or level off. A good indicator to monitor potential office market supply is to calculate inventory under construction as a percentage of each market's total inventory. We have found that a market that has a total vacancy rate and potential supply figure greater than 12% bears watching.

Figure 11. US Vacancy Rates by Product Type, 1991, 1999 and 2000F

	1991	1999	2000F
Office	18.9%	9.5%	9.0%
Retail	11.6	7.4	8.0
Warehouse	7.9	7.0	6.8
Multifamily	8.9	7.7	7.1

F Forecast.

Source: Salomon Smith Barney.

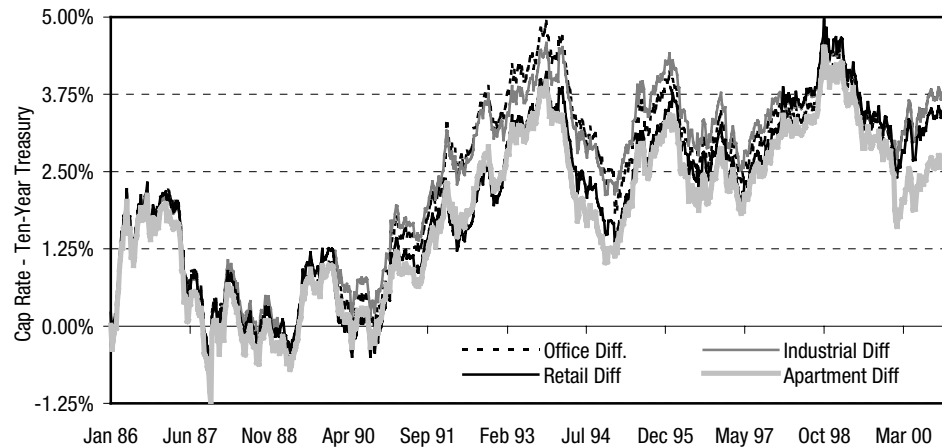
Another feature that is different about the current real estate market is the yield or “cap rates”⁷ used to value real estate, which since 1992 have been 3%–4% higher than Treasury rates. In contrast, during the real estate boom of the late 1980s, cap

⁶ Preleasing is a real estate development term used to refer to the percentage of the development that has contractual lease agreements signed before the construction lender advances funding to a developer to build.

⁷ A common method to value commercial real estate is to divide the property net operating income by a capitalization percentage. The interest rate used is referred to as a “cap rate.”

rates were often at or through Treasury rates, with investors buying properties with negative leverage in anticipation of future property appreciation. When the anticipated appreciation didn't happen in the early 1990s and the properties' cash flows were affected by the economic slowdown, borrowers had a very small coverage buffer before the properties' cash flow turned negative. However, since the recession, investors usually targeted a 9%-13% return when trading commercial real estate. Such returns provide a large safety margin on mortgages originated and securitized since 1994. **Thus, we expect that mortgages originated over the past six years have a lower probability of default than mortgages originated in the late 1980s.** In addition, we expect that if the economy were to slow, valuation cap rates would remain stable because property yields are high relative to interest rates. In Figure 12 we show the historical spread between cap rates and Treasury rates.

Figure 12. Cap Rate Spreads Versus Ten-Year Treasury Yield, 1983–2000



Source: Salomon Smith Barney.

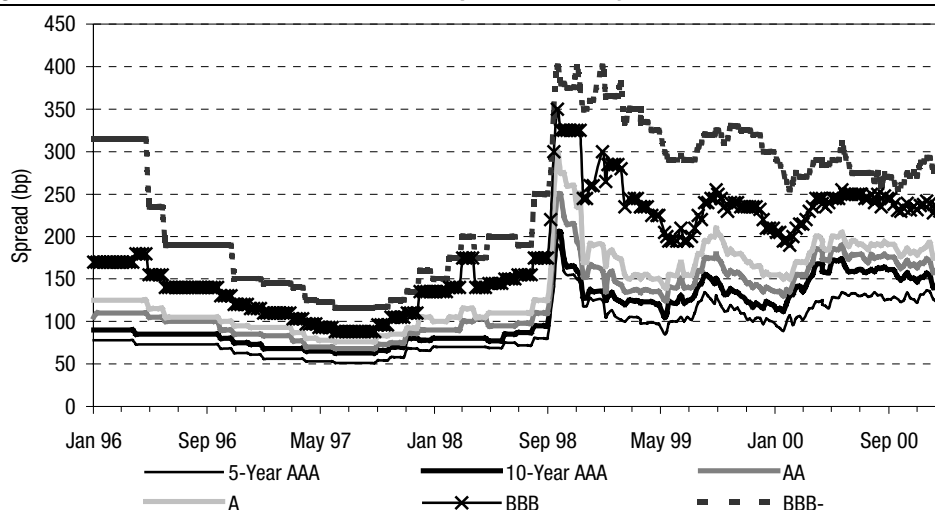
Given current high cap rates and low vacancy rates, we do not expect the next real estate recession to be as severe as the previous one. We would be concerned if vacancy rates were to rise significantly while 3%-5% of inventory was under construction or if the cap rate-Treasury rate differential were to decrease.

Nonetheless, at this stage, until the full extent of the current economic slowdown is established, investors' cautious approach to retail and hotel exposures in CMBS transactions is prudent. Retail construction starts never declined significantly from late-1980 levels. Rather, retail development moved from regional shopping centers to power centers. This retail construction has been supported by strong consumer spending (including at times a negative savings rate), which means the pace of retail sales may be unsustainable in an economic slowdown. Investors should actively monitor retail loans because slowing retail spending will likely increase retail delinquencies. Because it is impossible to avoid retail loans altogether, investors should consider employing a retail tenant concentration review such as the one that we outline later in this report in "CMBS Collateral Credit Review: A Loan-by-Loan Approach for Real Estate Novices." It is also important to realize that while retail loans may experience a high level of delinquency, retail loan recoveries are usually higher than recoveries for other commercial property types because the property space can have many alternative retail uses.

CMBS Relative Value and Pricing Methodology

Commercial mortgage investment has traditionally been considered a high-risk activity requiring specific market expertise. Therefore, when CMBSs were introduced, only accounts with specific real estate experience took to the new product and were able to command significant spread differentials. Figure 13 presents historic CMBS investment-grade spreads.

Figure 13. CMBSs — Historic Investment-Grade Spread to Treasury Notes, Jan 96–Dec 00



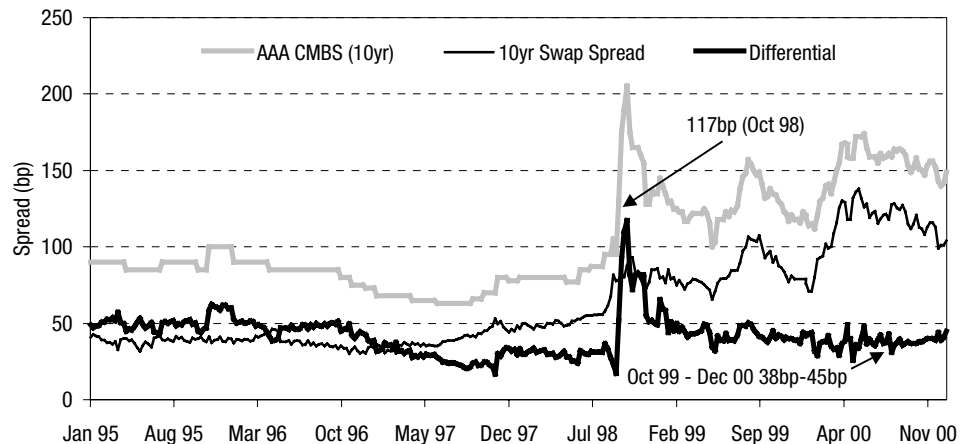
Source: Salomon Smith Barney.

As the market grew and more investors began to follow the CMBS asset class, its spreads tightened. Spreads reached their tightest point in mid-1997, when even mezzanine investment-grade classes were very tight to the higher-rated classes. The October 1998 bond market crisis surprised the developing CMBS market, as many commercial mortgage originators and issuers had been carrying large mortgage inventories, enabling them to assemble optimal CMBS securities and enjoy excess mortgage spread return while the mortgages were on their books. When all debt spreads suddenly widened, these issuers suffered significant inventory losses because many had only partially hedged their positions. The impact of the bond market crisis on the CMBS market was compounded by the repurchase positions that many issuers held from selling bonds to subordinate investment-grade investors. These positions experienced large margin calls and culminated in CRIIMI MAE's being unable to meet its margin requirements and filing for bankruptcy protection. At that point, issuers that had made an active secondary market had as much exposure to CMBSs as their credit mechanisms would permit, causing bid/offer spreads to widen in the secondary market. In fact, some dealers ceased quoting CMBSs altogether for a brief period.

During late 1998 and the first quarter of 1999, issuers cleared their inventories and those that have remained in the market have diligently worked since then to clear their mortgage inventory on a quarterly basis. Repurchase financing leverage levels have also been scaled back significantly. Today, market makers carry smaller CMBS

primary, secondary, or financing exposures. These positions are also being hedged more actively using combinations of Treasuries, swaps, and single-family mortgages. Since 1997 the relationship between swaps and CMBS spreads has been very strong. Figure 14 presents ten-year CMBS triple-A spread versus the ten-year swap.

Figure 14. Historical Ten-Year CMBS Triple-A Spread Versus the Ten-Year Swap, Jan 95–Dec 00



Source: Salomon Smith Barney.

Over the past five years, the ten-year triple-A CMBS and ten-year swap differential has averaged 42bp. However, the differential has varied from the average on several occasions. From January 1997 to September 1998 the differential averaged 29bp, and it increased to 117bp during the bond market crisis. Since late 1999 the differential has moved in a 38bp-45bp range, demonstrating a very stable CMBS secondary market. Figure 14 does not reflect the CMBS market convention of actually quoting the CMBS spread to the on-the-run interpolated swap, which would be 5.7 years for most five-year class and 9.5 years for most ten-year classes. Therefore, the actual spread differential may be 1bp or 2bp wider than the stated differential as the Treasury swap curve is usually downward sloping. The other CMBS classes have well-established trading ranges relative to the ten-year triple-A classes. Figure 15 summarizes these the various class trading ranges and averages.

Figure 15. Generic Tier 2 CMBS Spread Interrelationships for Relative Value Judgement, 29 Dec 00

	Ten-Year AAA to				
	Five-Year AAA	AA to AAA	AA to A	BBB to AAA	BBB- to BBB
29 Dec 00	20.7	17.0	15.0	85.0	50.0
One-Year Average	30.2	16.0	15.8	83.8	48.5
Two-Year Average	25.3	17.9	18.6	95.3	69.3
Three-Year Average	20.9	18.2	18.5	90.5	60.1
Five-Year Average	17.3	15.7	15.2	74.3	60.2
Five-Year Low	8.0	5.0	4.0	25.0	15.0
Five-Year High	45.0	50.0	65.0	170.0	145.0

Source: Salomon Smith Barney.

We show the differential between triple-A five and ten-year CMBS for reference only. Because of the differing maturity these two classes should really be assessed based on their long-term relationship with their related swaps. Generic tier 2 five-year triple-A CMBS have a three-year average differential of 32bp with the five-

year swap. And as previously illustrated, the ten-year triple-A class has a five-year average differential of 42bp with the ten-year swap.

If we look at the five-year average spread step-up for going down one class, Figure 15 demonstrates that investors should expect to pick up 15.7bp for investing in double-As versus triple-As and 15.2bp for investing in single-As versus double-As. The five-year differential between triple-Bs and triple-As is 74.3 but has been much wider in recent years, averaging 95bp over the past three years. Meanwhile, the recent strong collateralized bond offering bid leaves triple-B minus spreads trading 10bp inside their five-year average differential with triple-B.

We have provided these CMBS inter-relationship ranges and averages as a reference point only. The high and low spread differentials have varied significantly from their averages over different periods of time. The key to successful relative-value investing is to spot the collateral feature or trend that will attract investors to one of the various certificate classes and cause one of the relationships to move away from its established average range.

We have never compared a CMBS class to anything other than the similarly rated corporate class, because down-rated comparisons imply the CMBS class should be trading wide of a lesser-rated security.

Many investors and analysts compare triple-A CMBS to single-A corporate bonds. We have never compared a CMBS class to anything other than the similarly rated corporate class, because down-rated comparisons imply the CMBS class should be trading wide of a lesser-rated security. Recent CMBS spreads, which have demonstrated strong performance versus similarly rated corporate bonds, seem to vindicate this relative-value credit approach. **Given the credit protection provided by the senior/subordinate structure of CMBSs and their strong underlying collateral performance, these credits should prove as good as or better than similarly rated corporate credits.** Specifically, the CMBS structure means that any CMBS downgrade usually only results in a one-notch downgrade for a certificate — from single-A to single-A-minus (incrementally) for example — because of the subordinate credit enhancement built into each transaction. By contrast, corporate downgrades have demonstrated that they can move through multiple classes (single-A corporate ratings can become double-B or single-B) in a short time frame. Of course, to perform a full relative-value analysis investors should still review alternative investment opportunities.

In addition, the CMBS market continues to demonstrate strong liquidity that should persist in an economic stress scenario as long as the underlying collateral fundamentals remain strong. In an economic slowdown we would expect that cash flow deterioration would be slow and, as Fitch highlighted in a recent study,⁸ partially offset by the loan diversification in the CMBS pools. **However, as CMBSs are a relatively new product, the market needs tangible evidence of how CMBS collateral delinquencies and losses perform versus other debt products in an economic stress scenario.** Once CMBS have demonstrated the credit benefit of their subordinate structure, then their strong liquidity should ensure they trade on par with similarly rated corporate classes.

⁸ *Comparing CMBS and Corporate Bond Defaults*, Diane Lans and Janet Price, Fitch, November 17, 2000.

CMBS Prepayment Variables Impact Total Return

Restrictions on prepayments, along with the time and cost (typically 3%-5% of the loan balance) involved in refinancing a commercial loan, mean that CMBS investors are unlikely to experience the sudden refinancings that afflict investors in MBSs backed by residential loans. **However, defaults and resulting liquidations of loans can prepay principal to the upper-rated classes and create losses to the most subordinate class.** Therefore, many investors also supplement their spread analysis with analysis that takes into consideration the potential of early bond prepayment from voluntary or involuntary loan prepayments. Alternatively, if the loan defaults occur at loan maturity, then the CMBS certificate holder can find the mortgages being extended, increasing their average life.

Because of their potential cash flow volatility, many CMBS investors use collateral cash flow services to evaluate the bonds under different prepayment, default, and loss scenarios. The three major CMBS cash flow-modeling services are Charter Research, Intex Solutions, and TREPP. Each of these services enables an investor to model different prepayment speeds, delinquencies, and losses to evaluate CMBS pricing and yield sensitivity. Because defaults have been random and unpredictable, many investors feel that general overall default and prepayment rates, while admittedly unrealistic, at least provide some baseline stress analysis. Investors usually use four common pricing scenarios:

- 1 **0% CDR⁹ and 0% CPY.¹⁰** Zero defaults, no prepayments during the loan lock-out and yield maintenance periods, followed by no prepayments after the loans' yield maintenance periods (0% CPY). Although unrealistic, this measure is the most common starting point to reference CMBS pricing.
- 2 **0% CDR and 100% CPY.** Zero defaults, no prepayments during the lock-out and yield maintenance periods, followed by prepayment in full (an assumption usually labeled 100% CPY). This is a common scenario and is also used by investors as a base line.
- 3 **0% CDR for 2 years, 1% CDR thereafter and 100% CPY.** Zero defaults for the first two years, followed by a 1% constant default rate (1% CDR) at a 40% loss severity over a 12-month recovery period with no prepayments during the lock-out and yield maintenance periods, followed by prepayment in full. A default rate of 1% per year (or a CDR of 1%) implies a cumulative default rate of 9.5% after ten years, which we view as a likely scenario. Investors usually also vary the loss rate from 30% to 50%.
- 4 **0% CDR for 2 years, 2% CDR thereafter and 100% CPY.** Zero defaults for the first two years, followed by a 2% constant default rate (2% CDR) at a 40% loss severity over a 12-month recovery period with no prepayments during the lock-out and yield maintenance periods, followed by prepayment in full. A 2%

⁹ CDR refers to a constant default rate that is applied annually to the outstanding pool balance.

¹⁰ CPY refers to constant prepayment rate following the yield maintenance period.

CDR implies a cumulative default rate of 18% after ten years and represents a possible delinquency scenario.

Ten-year investment-grade yields are fairly insensitive to reasonable prepayment and default scenarios, while premium- or discount-priced five-year triple-A and IO yields are most sensitive to changes in prepayment speeds and defaults

These various pricing scenarios can have different impacts on each of the certificates within a CMBS structure. In Figure 16 we present the WAL and yield of a five-year triple-A and a ten-year triple-A, single-A, triple-B, and IO certificate from a recently issued tier two CMBS transaction.

Figure 16. CMBS WAL and Price for Generic Tier 2 CMBS Issue Under Multiple Scenarios

Scenario	Five-Year Triple-A		Ten-Year Triple-A		Ten-Year Single-A		Ten-Year Triple-B		Ten-Year IO
	WAL (Yrs)	Yield (%)	WAL (Yrs)	Yield (%)	WAL (Yrs)	Yield (%)	WAL (Yrs)	Yield (%)	Yield (%)
I. 0% CDR, 0% CPY	5.87	6.38	9.71	6.52	9.90	6.85	9.90	7.42	9.17
II. 0% CDR and 100% CPY	5.74	6.38	9.51	6.52	9.82	6.85	9.90	7.42	8.83
III. 0% CDR for 24 Mos., 1% CDR, 100% CPY	5.58	6.38	9.48	6.52	9.82	6.85	9.97	7.42	8.38
IV. 0% CDR for 24 Mos., 2% CDR, 100% CPY	5.46	6.37	9.44	6.52	9.86	6.85	9.98	7.42	7.93

Source: Salomon Smith Barney.

This example highlights many pricing characteristics of the various CMBS classes:

- The early prepayments highlighted in scenario II shortened the certificate's average life, but only slightly decreased the yield on the five-year triple-A class. If the certificates had been selling at a premium or a discount the yield would have been more sensitive to the prepayment speed. The IO class was the only class that was significantly affected by the faster prepayment as its yield decreased by 34bp.
- Increasing the delinquency rate did not have a significant impact on any of the regular certificates because no principal was lost even at the triple-B level (this was also true for the triple-B minus class). The triple-B minus certificates do not lose any principal until the CDR rate is increased to 3%, a scenario that we have not shown because it would result in a 30% overall pool default rate, which is unrealistic for the underlying pool. However, the IO is affected by increases in default rates, because the IO is prepaid earlier with no collection of prepayment penalty. In the example, a 2% increase in default rate decreases the IO yield more than 90bp to yield 7.93%. However, we view 2% CDR as a high pool stress, given that it results in a cumulative pool default rate of approximately 18%. **Nonetheless, the IO return at 2% CDR of 7.93% is still significantly higher than an initial yield on the ten-year triple-A class, demonstrating the strong relative value of CMBS IOs.** This analysis ignored the possibility of loan extensions, which should have resulted from loan defaults at maturity and increased the yield on the IO certificates.

This analysis was intended to highlight that ten-year investment-grade yields are fairly insensitive to reasonable prepayment and default scenarios, while premium- or discount-priced five-year triple-A and IO yields are most sensitive to changes in prepayment speeds and defaults. The scenarios should be considered simplistic, because they treat every CMBS pool as having the same

probability of default and expected prepayment speeds. A more sophisticated analysis would involve basing prepayments upon expected underlying equity refinance “cash-out” objectives and defaults upon expected future LTVs. All three of the major cash flow modeling companies provide data on the underlying properties’ most recent reported NOI, enabling investors to adjust future expected property cash flow based on property- or region-specific NOI growth assumptions. In addition, other third-party services can be tied into the three cash flow models, providing cash flow growth and future valuation parameters based on their analysis of property market conditions in each of the various regions.

CMBS Default Data

As discussed earlier, a good starting place to review CMBS defaults is the 1994 Snyderman commercial default study¹¹ and our recent performance report of the public universe of CMBS data.¹² The Snyderman study tracked 10,955 commercial mortgage loans, originated by eight insurance companies. The study observed a 13.8% default rate over a five-year period (equivalent to an annual rate of 2.6% CDR) and projected an 18.3% lifetime default rate for the entire pool (1.7% CDR). The study provided further expected lifetime default rates that ranged from 7.6% (1% CDR) to 21.5% (2% CDR), depending on the period studied, the originator, and the lifetime projection method. Our performance report shows that post-1993 CMBS collateral has accrued a 0.28% delinquency rate after two years, a 0.55% delinquency rate after three years and a 1.05% rate after four years. **Therefore, we feel that a reasonable and conservative range of default rates for scenario analysis is 1%-2% CDR.** Figure 17 presents CMBS delinquency rates for the public CMBS issuance universe.

Figure 17. CMBSs — Collateral by Origination Year

Origination Year	No of Loans	Pct. of Curr. Balance ^a	Total Delinquency ^b		Loss (MM)
			Loans	Pct.	
2000	2,029	8.7%	3	0.05%	\$0.000
1999	4,792	17.1	20	0.28	0.000
1998	11,256	35.3	76	0.55	5.164
1997	6,953	24.3	97	1.05	5.968
1996	3,555	7.9	55	1.46	3.929
1995	1,412	3.8	22	2.60	4.277
1994	1,140	1.5	6	0.71	1.724
1993	267	0.3	7	11.72	3.834
1992	119	0.2	1	0.41	0.119
1991	100	0.1	1	0.53	0.449
1990	78	0.1	2	2.79	0.739
Pre-1990	700	0.6	12	1.70	9.882
Total	32,401	100.0	302	0.78	\$36.085

^a Public deal universe current balance = \$154.9 billion. ^b The total delinquency rate includes loans that are 30, 60 or 90 days late, and loans that are in foreclosure or REO.

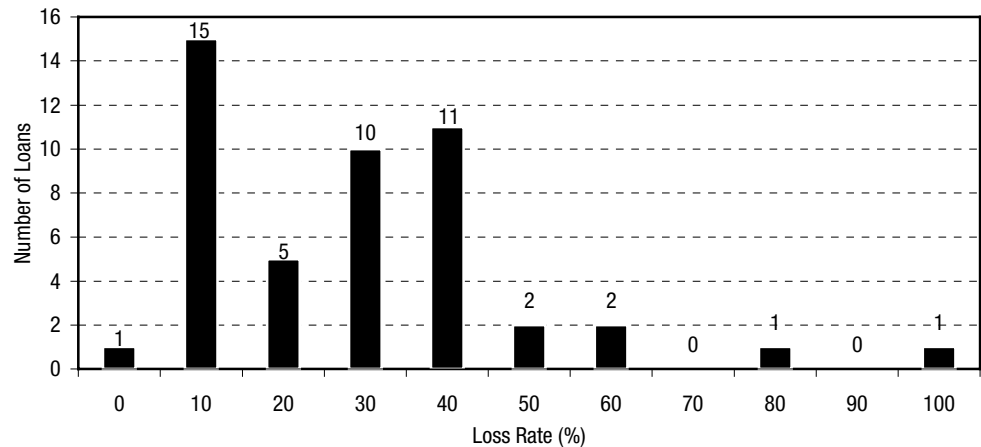
Source: Intex Solutions and Salomon Smith Barney (as of December 31, 2000).

¹¹ “Update to Commercial Mortgage Defaults,” Mark P. Snyderman, *The Real Estate Finance Journal*, Vol. 10, No. 1, Summer 1994.

¹² *SSB Issuer Performance Report*, Salomon Smith Barney, October 18, 2000.

The assumption for the severity of loss from a resulting liquidation after default is also critical to the analysis of CMBS cash flows. In Figure 18 we review each occurrence of loss in the outstanding public CMBS universe as of September 30, 2000. These loss rates typically range from 10% to just over 50%. In a recession that causes loan defaults to increase, we would expect the loan loss to be more severe, likely shifting to around the 40% loan loss used by many investors.

Figure 18. Outstanding Public CMBS Universe — Loss Severity of Defaulted Loans, as of 30 Sep 00



Source: Salomon Smith Barney.

The time until a loan defaults and the length of the recovery period after the default also affects CMBS cash flow. Typical default curves show that default rates rise between years two and seven; thus, using analysis based on an immediate default is extreme. We suggest that analysis should allow for a 12-month to 24-month delay before defaults occur. The defaulted loan's recovery period can also affect the underlying cash flows. Recent experience suggests a careful special servicer can take anywhere from 12 to 36 months to foreclose, work out, and liquidate a loan after a delinquency. In many instances, it is not uncommon for the special servicer to spend the first three to six months just assessing whether the delinquent borrower is acting in good faith to determine if foreclosure is necessary or whether a restructured loan might create the highest loan work out value.

This discussion was intended to highlight that there is no specific expected default and loss scenario for analyzing CMBSs. **This is why most CMBS structures are sequential pay, which insulates the longer-term investment-grade classes from default prepayments, while exposing only the short triple-A, the IO, and the non-investment-grade classes to significant default prepayment risk.**

Expected Default-Rates and Credit Tiering of Issuers

The impact that defaults can have on a transaction has caused investors to rank CMBS transactions based on perceived underwriter quality and transaction liquidity. Tiering CMBS transactions for liquidity makes sense because the events of 1998 removed some issuers from the market, creating orphan issues with no broker

specifically committed to providing a market. Factoring in underwriter quality is meant to account for the concept of “credit culture,” which the market suggests is stronger in bank-based originators. Credit culture is the idea that some institutions have underwriting checks by third parties whose compensation is in no way tied to issuance volume. However, as discussed in the appendix of this report, the rating agencies review the underwriter’s credit origination process and adjust credit enhancement levels to account for their analysis. Agencies’ opinions on an underwriter are contained in the presale report and, in our experience, can cause a subordination variance of up to 2% between transactions. **The extra subordination built into some transactions may mean that investors are overcompensating for issuer quality if they also differentiate prices based on issuer.** We have analyzed CMBS default rates by issuer but, given the current strong real estate environment, are unable to detect a meaningful relationship between issuer and loan performance. Loan performance by issuer figures are provided in Appendix C of our quarterly *SSB Issuer Performance Report*.¹³

To date, loan defaults could be best described as random events. In general, defaults are higher in floating-rate transactions and on single-tenant retail properties. As of the third quarter 2000, the public CMBS universe showed losses of only \$27 million on an entire CMBS bond universe of \$233 billion, which is impressive relative to other asset-backed securities. However, the current economic environment is not a good recession test of the CMBS credit-enhancement structure, and none of the underlying pools has aged to the typical ten-year balloon test date. We expect that when the next recession occurs, a default pattern will develop based on origination year, underwriting quality, and property type.

Delinquency rates are important, because any large delinquency immediately affects a CMBS transaction’s liquidity and causes CMBS spreads to widen. This spread widening is well acknowledged to be illogical, given that some defaults are originally projected for all CMBS transactions and are unlikely to create an investment-grade principal loss. **However, given that spreads widen quickly on any bad, deal-specific news, investors have actively bid for transactions with low expected default rates, creating a small pricing difference between some issuers.**

Although highly subordinated transactions may experience more defaults, they are unlikely to remain on credit watch for long periods because the extra credit enhancement usually enables the rating agency to affirm levels quickly. In 1999 a good example of the benefits of high subordination came from three credit tenant lease (CTL) transactions that contained a large amount of Rite Aid exposure.¹⁴ In November 1999 Moody’s downgraded Rite Aid to B1, putting the three CTL transactions on credit watch. The largest Rite Aid exposure was contained in MLMI 1998 CTL, which had more than a 20% exposure, while two other CTL transactions had less than 10% of their loans backed by Rite Aid. However, MLMI also contained almost twice the

¹³ *SSB Issuer Performance Report*, Darrell Wheeler and Jeffrey Berenbaum, Salomon Smith Barney, October 18, 2000.

¹⁴ We presented a full analysis of this transaction in our article, “Pricing Tenant Concentration Risk into Credit Tenant Lease Transactions,” Darrell Wheeler, *Bond Market Roundup: Strategy*, Janet Showers, et al., Salomon Smith Barney, November 12, 1999.

credit enhancement of the other CTL transactions, enabling Moody's to quickly affirm MLMI while the other transactions remained on credit watch.

Transactions vary and this simple example may not always apply. **In general, transactions with high credit subordination levels have extra default and loss protection and may weather a recession better than a lower-leverage transaction that has worse subordination levels.** Specifically, a transaction with 1% extra subordination at the triple-A level can withstand 2.5% more loan defaults than a pool with lesser subordination (assuming a 40% loan loss rate).

In 1999 the market actively bid tier one and tier two issues, while tier three transactions had limited liquidity. In 2000, the tiering price differential narrowed as investors realized that tier two and three transactions offered more default protection and greater relative value. As the CMBS market experiences more defaults, investors should grow more comfortable with defaults and further reduce any underwriter tiering differentiation in the market. Long-term CMBS investors will find value in the lower-tier CMBS issuers, which have greater subordination and wider spreads, while short-term CMBS investors that mark to market should stick with the tier one and two categories to minimize defaults and the resulting immediate spread widening caused by headline risk.

CMBS Collateral Credit Review — A Loan-by-Loan Approach for Real Estate Novices

Even though CMBS transactions have significant credit enhancement and are well diversified, it is still useful to review the underlying collateral to gain familiarity with transactions and be able to compare one transaction to the next. The best way to do this is by stratifying the property information provided in a spreadsheet using the loan summary file from the issuer's Schedule A. Given the information in Schedule A, even a real estate novice can summarize and review the properties' key loan data in a consistent format to spot loan leverage or tenant irregularities.

We suggest that investors develop a format that takes Schedule A and extracts the property type, loan name, address, balance, LTV, DSCR, building area, loan per building area, and the top two tenants' names with their square footage, lease expiry dates, and other data. Once the data are in this format, an investor can quickly scan all the properties in a transaction and determine what the major tenant concentrations are, how much of the area they occupy, and when their leases expire. On some property classifications such as anchored retail, this format also lets investors get a sense of what the tenants and underwriter considered to be "anchored" and how far the issuer felt it needed to stretch the definition. This tenant analysis does not require significant real estate expertise, just a general knowledge of the nation's major retailers and corporations and an eye to question when one tenant may account for too much of a loan's square footage. Figure 19 shows a typical loan stratification format that we would suggest.

We gain comfort when we see that the two largest tenants hold less than 6,000 square feet of any larger property, because it is easier to replace a smaller tenant from the larger pool of potential replacement tenants. In addition, having more smaller tenants means that the property's revenues are more widely distributed than a property with fewer, larger tenants.

This loan stratification technique is especially helpful in reviewing retail properties. In a retail mall in which one or two large tenants represent more than 60% of the loan's rentable area, they likely provide the draw to the center that enables the smaller tenants to pay high rents. Anchor tenants usually under-contribute to the malls' revenues (paying \$2-\$12 per square foot (psf)), while the smaller tenants usually provide the bulk of the property's income (paying rents of \$15-\$30 psf or more). **The real risk of anchored retail is that the loss of the anchor tenant can leave the other smaller tenants without the necessary traffic to generate their higher rent payments.** In the current strong economy an anchor tenant loss has not presented a significant problem to borrowers, because in most cases a replacement tenant has been available. However, in a slower economy, the loss of a large tenant may have a severe impact.

Figure 19. Suggested Loan Stratification Worksheet to Review Annex A

Property Type:	Total/Ave. Pool	Anchored Retail	Office	Hotel/Limited Service	Outlet Center
ID #		1	3	4	5
Property Name		Arizona Mall, 100 Arizona Circle	19 Roadway Building, 19 Roadway	Motel 4 Suites Portfolio	21 East Center, 21 East St
City/State		Tempe, Arizona	Colorado	various, FL,AZ,OH,NJ	New York, New York
Year Built/Renovated		1997,	1985,	1967, 1998	1999/2000,
Cut-Off Bal	\$950,457,000	140,000,000	49,966,246	31,200,000	29,978,826
Category % of Pool	100%	14.73%	5.26%	3.28%	3.15%
Area/Units		1,100,500	621,577	891	94
\$/AreaUnit		\$127.21	\$80.39	\$35,017	\$318,924
Occupancy		97%	96%	76%	100%
Major Tenants		1. Sears 103,000 sf, 11/30/03 & 2. Lord & Talyor 88,000 sf, 05/31/09	1. Column Systems, Inc. 100,420 sf, 12/31/08 & 2. AT&T, 55,000 sf, 09/31/02	NA	1. Bed Bath & Beyond 60,522 sf, 08/31/10 & 2. Marshalls 33,450 sf, 05/31/08
Sponsor		ABC Real Estate Company	ZYX Company	FGX LTD.	ZYX Company
Leasehold		Fee Simple	—	—	Fee Simple
Lockbox		Hard	Hard	None	None
Required Reserves		184,500.00	127,147.00	—	30,288.00
Ti/LC Reserve		1,300,000.00	840,575.00	—	-
Appraisal	\$1,335,365,000	\$250,000,000	\$79,000,000	\$70,800,000	\$5,900,000
App LTV	71.18%	56%	63%	44%	65%
Balloon LTV	61.11%	52%	57%	37%	58%
Loan Rate	8.11%	7.90%	7.97%	8.44%	7.75%
Loan Cash Flow	\$139,070,228	\$20,097,142	\$6,499,426	\$6,175,617	\$3,786,951
Actual Maturity	122.2	120	120	120	120
Actual Amortization	354.7	360	360	300	360
U/W DSCR	1.44	1.58	1.48	1.93	1.47

Source: Salomon Smith Barney.

This analysis also enables investors to become accustomed to a range of loan per square foot or per unit in the case of apartments or hotels and determine when the loan per unit varies from the normal loan range. The loan stratification approach enables even a non-real estate expert to recognize when the loan amount is higher than normal, requiring an underwriter explanation. The figures shown in Figure 20 represent a rough loan per unit guide. Strong properties can certainly carry higher loan per unit values, but using a guide enables an investor to ask the underwriter why the loan has the higher loan per unit value and may elicit important transaction screening information.

Figure 20. Typical Conduit Loan Lending Amounts

Property Type	Typical Loan Range (\$/Unit)
Multifamily (high quality)	\$30,000-\$80,000 per unit
Multifamily	\$10,000-\$30,000 per unit
Office (downtown)	\$80-\$150 psf
Office (suburban)	\$60-\$125 psf
Retail (anchored)	\$40-\$125 psf
Retail (unanchored)	\$40-\$130 psf
Industrial (warehouse)	\$30-\$80 psf
Hotel (full service)	\$40,000-\$80,000 per suite
Hotel (limited service)	\$20,000-\$45,000 per suite

Source: Salomon Smith Barney.

The ranges in Figure 20 will vary by geographic region and local market conditions. In many areas where alternative development sites are plentiful and the economy is weak, the figures will be too high and in other areas where there are limited infill development sites and strong economies the figures will be too low. We have discussed the loan stratification method as a means for investors to become familiar with the underlying real estate information and to become comfortable with the assets. For investors that only buy the senior-rated classes of CMBS transactions, a strong argument can be made that current subordination levels provide sufficient credit protection and that they will never need to know the underlying real estate properties of a diverse pool. However, for investors that wish to scratch below the transaction surface, a loan stratification table is a good way to start.

Liquidation and Paydown — An Analysis Framework for Distressed CMBS Transactions

Many CMBS investors are sophisticated real estate investors and find value in reviewing the few distressed CMBS situations available in the market. In this last section of this report, we describe a simple methodology to review distressed CMBS certificates and determine the underlying bonds' collateral risk.

Given the strong economy of the past few years no CMBS conduit transactions have experienced significant defaults. Therefore, to get an idea of how CMBSs will perform in a distressed scenario we are forced to review lumpier fusion or CTL transactions. Among these lumpier CMBS transactions a major collateral event can cause a significant widening in spreads and loss of value.

This methodology assumes a worst-case liquidation value for the affected collateral and then removes the distressed loans from the pool using the recovery to pay down the triple-A classes and reducing the subordinate classes by the amount of the loss.

Although this analysis is simplistic and ignores any loan amortization that may take place before a default event, it enables investors to quickly estimate if distressed loans represent principal or even rating agency downgrade risk. In the majority of cases, using reasonable liquidation assumptions, the subordination to the triple-A class actually improves after liquidating the affected loans. This paydown analysis suggests the triple-A classes of CMBS transactions that have experienced a collateral event have significant credit protection and offer excellent relative value. Investors in the lower-rated classes can use the same methodology to assess investment opportunities but must carefully calculate the affected loans' estimated liquidation value.

To illustrate how to analyze the liquidation of distressed loans, we review two transactions that have experienced a major decrease in collateral quality.

Case 1. Rite Aid Exposure in MLMI 1998-C1-CTL

The first CMBS transaction we review is Merrill Lynch Mortgage Investors, Inc, Series 1998-C1-CTL. This transaction is a CTL transaction¹⁵ that at the time of this analysis had a 20.6% concentration of loans supported by a bondable lease with Rite Aid Corporation. On October 18, 1999, Rite Aid announced that it would restate its financial statements for each of its fiscal years ended 1999, 1998, and 1997 by as much as \$500 million. After the announcement, the market became illiquid with the MLMI triple-A classes trading at triple-B spreads.

We first reviewed this transaction in the fall of 1999, when Rite Aid's corporate rating was downgraded from BBB-/Baa3 to BB/Ba2. At that time we said that we expected the triple-A classes to continue to be rated triple-A even if Rite Aid were to file for bankruptcy. Then in July of 2000, S&P and Moody's downgraded Rite Aid's

¹⁵ CTL transactions contain commercial mortgage loans secured by one or more properties leased to tenants that have a rating agency credit rating. The credit tenant is usually responsible for all of the costs associated with operating the property and makes loan payments to fully amortize the loan. A fully structured credit tenant's obligation enables the rating agencies to analyze a high-leverage mortgage loan as though it carried the rating of the underlying tenant.

Corporate rating to single B, but with no impact on the investment-grade rating of the MLMI transaction. In Figure 21, we review the liquidation analysis that enabled us to have confidence in the triple-A classes of the transaction.

To analyze Rite Aid's potential impact on the transaction, we estimated the liquidation value for the related loans and then removed them from the pool, realizing the liquidation value as a prepayment to the triple-A class. Any shortfall between the liquidation value and the outstanding loan balance was treated as a loss to the subordinate classes. After the entire loan balance was removed from the pool with the proceeds prepaying the triple-A class, we recalculated the resulting subordination levels based on the smaller loan pool. We focused on the triple-A class because the majority of the CMBS universe is triple-A rated, and this class directly receives the benefit of the liquidation prepayment. The mezzanine investment-grade classes also receive a benefit from the triple-A prepayment, being next in line for prepayment; however, the subordination loss from the reduction in the lower classes usually overshadows the prepayment benefit.

In a CTL transaction such as MLMI, the rating agencies have developed the concept of **dark property value** to refer to the alternative use value of a property that would be realized if the tenant were to default and the property had to be redeveloped for another tenant. This dark valuation technique typically calculates value based on the area's market rent for similar retail space capitalized at a stabilized cap rate or property yield. The final dark value is derived from the alternative use value by deducting the cost of releasing the space, the lost rental revenue during the building's foreclosure and redevelopment, and a profit for the developer that buys and redevelops the asset. This dark value is effectively the liquidation value needed to remove the Rite Aid loan from the transaction. In Figure 21 we calculated the liquidation value for the Rite Aid Stores loan and deducted the proceeds from the MLMI transaction. The result is that the triple-A subordination level increased to 32%.

Figure 21. Subordination Levels Without Rite Aid With Expected Paydown from Rating Agency Value

Rating	Current Credit Enhancement	Class Size	Current Class Size (MM)	Less Paydown/ Loss (MM)	Class Size Without Rite Aid (MM)	Subord % After Loss
AAA/Aaa	31.3%	68.7%	\$425.09	\$91.11	\$337.48	32.0%
AA and A Class	19.8	11.5	71.07		71.07	17.6%
BBB and BBB- Class	12.0	7.8	48.46		48.46	7.7%
Noninvestment Grade		12.0	74.30	36.44	37.85	
Total With and Without Rite Aid			618.90	127.56	491.35	
Expected Loss on Rite Aid Stores		Comment				
Rite Aid Loan Balance (MM)	\$127.56					
Loan to Dark Value	140%	A ratio based on the liquidation value of the empty stores calculated by capitalizing the market rent and deducting new tenant inducement, commissions, loss revenue, and new investor profit.				
Underlying Dark Value (MM)	\$91.11	Equals paydown to triple-A and is greater than difference between the old triple-A class size and the new required triple-A class size.				
Expected Loss (MM)	36.44	Loss to Non Investment Grade classes				
Conclusion: Resulting 32% Triple-A subordination remains above initial 30% subordination. No downgrade.						

Source: Salomon Smith Barney.

However, the downgrade risk in MLMI increases in the investment-grade classes as one goes down the credit classes. In the example, a rating agency committee would likely not downgrade the double-A or single-A classes based on 2.2% less subordination after liquidating the Rite Aid loans. However, investors in the double-A or single-A class of a transaction that has already experienced significant losses should undertake independent liquidation analysis to ensure that they are comfortable with the classes' downgrade potential. We do not see any principal loss risk in the double-A and single-A rated classes. In this liquidation scenario the triple-B and triple-B minus classes could likely be downgraded a notch because they lose a larger proportion of subordinate protection (12% subordination before the liquidations becomes 7.7% after).

This example assumes that Rite Aid defaults on all the locations. A more likely scenario might involve Rite Aid's filing for bankruptcy and then affirming only the leases on the better retail locations where the company has achieved its best sales. This type of scenario would leave the special servicer with a smaller number of below-average store locations to liquidate. Investors can use this methodology to default and liquidate different combinations of Rite Aid and other tenants at higher loan to dark values ranging from 140% to 200%, and determine that the triple-A class of the transaction is unlikely to be downgraded. In one of our worst-case liquidation scenarios, the triple-A subordination decreased to 25.5%, which we think would be a borderline point for the rating agencies to consider downgrading the triple-A class.

Secondary investors that bought the triple-A paper at a discount should actually want a tenant default and liquidation, because the early principal paydown will increase their yield to maturity without triggering a downgrade to their security. The liquidation analysis suggests that the triple-A class of the transaction is an excellent long-term value given its current wide spread premium. **The fact that this transaction can weather 20% of the underlying loans defaulting highlights the strength of the senior prepayment structure and is why most triple-A CMBS certificates should trade with strong liquidity in a recession or during any deal specific distress.**

Case 2. Asset Securitization Corporation, 1997 MD VII (Limited Service Hotel Exposure)

ASC 1997 MD VII is a large loan transaction containing seven mortgages on 71 properties. The loans range in size from 5% to 33% of the pool. All four of the rating agencies originally rated various classes of the transaction, determining that the loans were well-structured low-leverage loans. On August 31, 1999, the largest loan's borrower, Fairfield Inns by Marriott LP, requested possible loan modifications, causing the loan to be transferred to the special servicer. Since the initial inquiry, no formal request was received from the borrower, so the loan was transferred back to the master servicer. However, the request caused the four agencies to review the loan and adjust their opinion of the collateral.

On September 2, 1999, Fitch IBCA downgraded the A-5 and A-6 classes, originally rated triple-B minus, to double-B and single-B, respectively. On November 17,

1999, Moody's downgraded the A-3 and A-4 classes from A2 to A3 and from Baa2 to Baa3, respectively. On November 24, 1999, S&P affirmed the triple-A class and downgraded the B-1 and B-1H classes from double-B to single-B. DCR followed on December 14, 1999, when it downgraded the A-4 class from triple-B to triple-B minus and the A-5 class from triple-B minus to double-B. All of this rating agency activity was a direct result of a decline in the Fairfield Hotel portfolio's performance.

At the time of our review, the Fairfield Inns loan had an outstanding balance of \$153.5 million, and constituted 32.6% of the transaction's total pool balance. The loan was structured as a first-priority, cross-collateralized, cross-defaulted mortgage on 50 Fairfield Inns limited-service hotels spread across 16 states (6,673 rooms). All of the rating agencies determined that the underlying properties had experienced a significant increase in operating expenses and a decline in room revenue owing to increased competition in the various submarkets. This operating performance translated into a significant decline in debt service coverage since the original rating agency reviews (see Figure 22).

Figure 22. Fairfield Loan — Rating Agency Assessment of Performance

Agency	Original DSCR ^a	Original Value/LTV (MM) ^a	Recent DCSR	Comment
UW	1.62x	\$270/61%		As per the offering materials.
Fitch IBCA	1.57x	NA	1.16x (2 Sep 99)	Recent DSCR based on TTM cashflow and actual debt service for period ending 30 Jun 99.
Moody's	1.53x	\$239/69%	1.19x (17 Nov 99)	Recent DSCR based on servicer report ending 30 Jun 99.
S&P	1.59x	\$221.3/74.5%	1.34x (24 Nov 99)	Recent DSCR based on 25% cash flow reduction and actual debt service.
DCR	1.53x	\$252.5/65.6%	1.15x (14 Dec 99)	Recent DSCR based on 12 months results ending 30 Sep 99.

^a Original DSCR and values based on the offering documents or each rating agencies' presale report.

Sources: Rating presale reports and rating actions.

Using the liquidation methodology to evaluate this situation requires a worst-case estimate of the underlying value of the limited-service hotel portfolio. The rating agency values represent a value based on a sustainable cash flow and cap rate. These rating agency values suggest a liquidation value range of \$33,000-\$38,000 per room. However, our experience from the early 1990s compels us to calculate a lower distressed value for limited-service hotels. If the hotel's occupancy rate were to drop from the original underwritten 70% range to less than 50% it is possible to envision only a marginal portfolio cash flow, leaving value to be determined by a minimum value per room benchmark. We called several hotel industry experts and were given recent unflagged limited-service hotel comparable sales figures of \$20,000-\$30,000 (we assume that the liquidated portfolio would no longer benefit from the Fairfield hotel flag). However, most of the experts agreed that at \$15,000 per room, a buyer would purchase the portfolio no matter what the economic circumstances. Therefore, for our liquidation scenario we will use an extreme \$15,000 per room value figure (see Figure 23). Alternatively, investors that do not have access to real estate

expertise may have used a 40% loan loss rate¹⁶ on the original loan of \$25,000 per room and achieved the same estimated liquidation proceeds of \$15,000 per room provided by our experts.

Just as in the Rite Aid analysis, the liquidation of the Fairfield loan actually improves the triple-A subordination levels, as the paydown to the triple-A class is greater in proportion than the original transaction's triple-A credit enhancement. The loss on the lower levels, however, significantly decreases the protection to all the mezzanine investment-grade classes, leaving even the double-A class exposed to a potential downgrade. We should caution that a scenario in which only \$15,000 per room is realized is an extremely tough stress test. A more realistic asset liquidation figure of \$20,000-\$30,000 would likely expose only the triple-B and triple-B minus classes to potential downgrades.

Figure 23. ASC 1997-MD VII Subordination Levels After Fairfield Loan Liquidation

Class/Rating	Current Credit Enhancement	Class Size	Current Class Size (MM)	Less Paydown/ Loss (MM)	Class Size without Fairfield (MM)	Subord % After Loss
AAA	36.1%	63.9%	\$300.21	\$100.10	\$200.12	36.8%
AA and A	18.6	17.5	82.43		82.43	10.7
BBB and BBB-	2.7	15.9	74.94	(40.90)	34.03	
Noninvestment Grade		2.7	12.49	(12.49)	—	
Total With and Without Fairfield Loan			470.07	153.49	316.58	
Expected Loss on Fairfield Loan		Comment				
Fairfield Loan Bal. (MM)	\$153.49					
Recovery/Suite	15,000	Based on worst case liquidation value.				
Total Recovery (MM)	100.10					
Expected Loss (MM)	53.39	Loss to noninvestment-grade classes.				
Conclusion: Resulting 36.8% Triple-A subordination remains above initial 33% subordination. No downgrade to triple-A classes.						

Source: Salomon Smith Barney.

The liquidation and paydown test demonstrates the benefit of the triple-A class's receiving the liquidation proceeds.

Liquidation/Paydown Test Conclusions

The liquidation and paydown stress test is a simple calculation that any investor with a spreadsheet can perform to make a judgement on collateral safety in CMBS transactions that have experienced poor collateral performance. The test does not account for the amortization that will take place during any loan liquidation and is only as good as the liquidation assumptions that are fed into the calculation.

However, a liquidation and paydown test usually demonstrates that the triple-A classes maintain their original credit enhancement levels even under the most severe liquidation assumptions. This suggests that the triple-A classes of CMBS transactions that have experienced collateral distress represent significant relative value for investors that can ride out any headline risk. The high default rate investigated suggests that most other CMBS triple-A should also be able to

¹⁶ The 40% loan loss severity is a common loan loss rate used to estimate potential loan losses. Commercial mortgage portfolio studies from the early 1990s suggest that a commercial mortgage will typically experience a 35% loan loss when liquidated.

withstand a significant increase in delinquencies without incurring significant rating agency downgrade risk.

The analysis can also be used to investigate the principal safety of the lower-rated classes of CMBS transactions to the extent these lower classes are not eliminated by the estimated loss reduction at the bottom of the transaction. However, using the tool to estimate downgrade potential in the mezzanine investment-grade classes is more uncertain, because firm rules are not established as to how much subordination can be lost before a rating agency credit committee deems a class downgrade necessary.

Finally, investors in distressed transactions should consider using one of the cash flow modeling programs that are available to phase in expected losses and allow for amortization of the loans during workouts. In our examples, cash flow analysis demonstrated a reduction in loan loss and a significant yield pickup in the triple-A classes, which are selling at a discount and, therefore, benefit from the early default prepayment.

Conclusion

Overall, we feel that investors reviewing CMBSs should understand the following points:

- The rating agencies have developed methods for measuring the likelihood that a particular commercial transaction will meet its scheduled payments to investors under various economic scenarios. These methods focus on financial leverage statistics, as well as on underwriting standards, property types, and property tenancy. **Overall, the rating agencies' credit enhancement models appear to provide excess credit protection relative to the default and loss experience of the previous real estate recession. During the past four years rating agencies have adjusted their commercial models to compensate for the strong collateral performance and to more realistically reflect the commercial property default probability. We expect that commercial credit enhancement levels will continue to decline even as the CMBS market experiences an economic slowdown and gains maturity.**
- Current CMBS collateral fundamentals are strong because of the relatively low level of construction funding. **Seasoned CMBS transactions have benefited the most from the strong real estate market as the underlying properties have experienced significant appreciation since the loans were securitized, and yet, the loans are precluded from prepayment by strong prepayment penalties.** These conditions mean that it could take several years of low economic activity to significantly affect the credit quality of existing CMBSs.
- Relative-value analysis comparison with other spread products suggests that CMBSs offer significant excess return. **Considering the CMBS market's improved liquidity over the past 24 months and given similar credit risk relative to that of other rated structured debt products, CMBS would seem to have collateral structure and market characteristics that justify a tighter overall spread (this is especially true for the triple-A rated classes including IO).** If during the next few years CMBS collateral performs well during a slowing economy, we expect strong investor demand will continue to push traditionally wide CMBS credit spreads tighter.

Appendix. Rating Agency Subordination Add-Ons

In this section we describe the potential subordination add-ons to CMBS pools to assist investors in reading rating agency presale reports. If any pool characteristic is highlighted as a negative in an agency presale, investors should not be overly concerned; rather, the discussion means that the rating agency caught a specific item and increased subordination levels to account for the feature. This extra credit subordination in transactions that have specific issues may cause them to price behind the standard generic CMBS transactions offering extra relative value.

Most of the adjustments reflect specific characteristic concentrations, which are a direct function of the overall pool size. **In general, the more diversified and less dependent a pool is on any one entity, the less concentrated the credit exposure and the lower the subordination levels.**

Diversity

As previously discussed, diversity is a measure of the loan concentration or “lumpiness” of the pool, which can affect subordination from 0% to 20%.

Moody's uses a Herfindahl index to measure the pool's loan concentration and then scales its subordination add-on accordingly. The Herfindahl score is calculated by taking the inverse of the sum of the squares of each mortgage loan as percentage of the overall pool.

$$\text{Herfindahl Index} = \frac{1}{\sum (\text{loan}/\text{loan pool})^2}$$

Most recent fixed-rate conduit transactions have had a Herfindahl score of 75 to 85, while a Herfindahl score of 100 is considered to be diverse and requires no add-on. Pools with a Herfindahl score below 60 should be considered lumpy, requiring significant extra credit enhancement. Investors in these lumpy pools are protected by the extra credit enhancement, but should make an effort to understand the larger underlying loans in case a default causes headline risk.

In the past, Fitch has looked at the three largest loans as a percentage of the pool and assumed that they will default to create an add-on factor; thus, the larger the percentage represented by the three loans, the larger the subordination add-on is. Similar to Moody's Fitch has just adjusted its model to look beyond the largest three loans by also using a statistical measure of the pool's loan diversity. Fitch then attaches a scale to its diversity measure to reflect a pool add-on of 0% to 15%, depending upon the lumpiness of the mortgage pool.

Property Type (Loan Specific)

The agencies believe that the optimal credit consists of a pool perfectly diversified by property type. Given a less than perfectly diversified pool, the agencies make a credit assessment based on assumptions regarding the credit risk of each property category. To do this, the rating agencies assign the property types different default probabilities or loss severity based on property-specific valuation property yields or

DSCRs. In general, the property types listed from least risky to most volatile are multifamily, mobile home, anchored retail, industrial, office, unanchored retail, full-service hotel, self-storage, nursing home or health care, and limited-service hotels. The agencies may also penalize the more volatile property types with a higher probability of default in addition to the tougher valuation parameters to reflect their less stable cash flows.

Recently, Moody's and Fitch have extended this property type analysis to reflect the individual MSA property market vacancy and expected rental growth projections, while S&P is on the record as stating that individual property inspections are the best property assessment method. S&P's property review methodology is valid to the extent that an agency is able to sample a large enough sample of the property pool being reviewed. As the market matures, the agencies have been sampling smaller portions of the overall pools, which the Moody's and Fitch's MSA methodology is meant to address.

Geographic Concentrations

Similar to property type, a commercial mortgage pool diversified by geographic location will reduce risk and, thus, required loss coverage. The agencies have developed a variety of methodologies to increase or decrease a CMBS transaction's subordination levels to account for geographic diversity. In most cases, once a pool is located more than 20% in one state, a subordination penalty will be scaled to the concentration (California is usually divided into two states, north and south, to account for its economic diversity and large population size). In addition, within the past year, Moody's and Fitch have each introduced pool scoring methodologies to account for the pool's diversity by property type and industry concentration, which they use to adjust their geographical diversity score and the pool's overall subordination levels. Moody's has taken this logic one step further with its measure of economic diversity that also looks at the pool's exposure to specific industries within each geographic region.¹⁷

Underwriting Quality

This evaluation reviews whether the underwriter carefully reviewed the underlying property and its market and required appropriate loan structural features. For example, a loan with significant lease expiries may require an escrowed releasing reserve or even a hard lock box and cash trap in cases where a loan default is considered highly probable.

Underwriter review also requires analysis of the underwriting criteria, appraisal standards, special hazard policies, and workout policies of the originator and servicer. The agencies will focus closely on the following areas in their evaluation:

- 1 Property appraisal standards and procedures.
- 2 Originator quality, based on historical portfolio performance.

¹⁷ See *CMBS: Conduit Economic Diversity Update for 2000*, Sally Gordon, John Chen and Natasa Agathocleous, Moody's Investors Service, September 29, 2000.

- 3 Originator's area of expertise, by mortgage purpose (for example, refinance versus new construction), property type and property location.
- 4 Servicing standards and policies, including those regarding balloon mortgages.
- 5 Approval procedure. Approval procedures that require third-party non-business line credit reviews are seen as objective and receive subordination credit.
- 6 Documentation procedures and loan tracking systems.

In cases in which all or some of the above data are unavailable, increased credit levels protect investors from potentially increased credit exposure. The rating agencies review the underwriter's work and may adjust subordination levels by plus or minus 2% to reflect their opinion of the underwriter's credit and loan structuring skills.

Special Servicing

The transaction's master servicer is usually required to transfer servicing to the special servicer after a loan has been in default for 60 days. The special servicer is responsible to deal with the defaulted loans to restructure the loan or recover the loan proceeds based on its assessment of the best method to maximize the net present value of loan proceeds. The workout negotiation of a defaulted commercial loan is a complex analysis and negotiation that can benefit from a special servicer's previous experience and ability to focus resources on the loan file. In our opinion, one person can handle five to 20 defaulted files at any one time depending on the complexity of the loan files. Therefore, the rating agencies may review each special servicer's human resources and experience and adjust subordination levels by 0% to 1.00% to reflect their opinion of the special servicer. The issuers realize that their issuance levels can suffer from having a poorly assessed special servicer and since 1997 have only used special servicers that the agencies have evaluated favorably and that have the resources to handle the next real estate recession.

Environmental Risk

When the issuer's underwriter reviews a loan for approval, part of the loan due diligence requires that the property undergo a Phase I Environmental Assessment. A Phase I assessment usually involves a physical inspection of the property by an engineer to detect common signs of potential environmental contamination. The engineer will usually determine a history of the property's past uses and investigate related potential environmental contamination. Typical Phase I investigation may involve soil sampling, paint inspection, and a sampling of other building materials such as tiles or insulation. If the Phase I testing determines that there are potential environmental issues, then a full-scale Phase II Environmental Assessment would be undertaken during which any test needed to determine the extent of contamination would be conducted and a site clean-up assessment would be performed.

Any environmental clean-up costs determined in either report would have to be reserved by 125% (to ensure a contingency buffer) before a mortgage loan is approved. This environmental assessment procedure has become standard mortgage loan due diligence for CMBS conduits and regular portfolio lenders, because many state environmental laws now have site clean-up standards that can create costs in excess of the mortgage value or even the property value. Sometimes small-balance commercial loans may be approved without a Phase I environmental review. In this

case the rating agency may adjust the specific loan's subordination levels up by 5%-10% depending on its assessment of likely contamination in the loan. However, most times when an issuer securitizes a loan, or group of loans, that have not had an environmental assessment, the issuer will obtain an environmental insurance policy that provides protection from preexisting, but undetected, contamination, and any liabilities that may result from the contamination.

Loan Amortization (Loan Specific)

Most fixed-rate conduit commercial mortgages are ten-year balloon loans with 30-year amortization schedules. Sometimes the underwriter may create a loan with a shorter amortization period (20 or 25 years) to reduce the balloon refinance risk for one of the more volatile property types. Or, the loan may be interest only with no amortization. The rating agencies adjust their loan credit enhancement levels to account for amortization differential by changing their assessment of loss potential or default risk at expiry. For instance, Fitch may assess a regular ten-year term 30-year amortization loan a 36% loss severity and an interest-only loan a full 40% loss severity. These assessments could change the loan's credit support by 2%-4%.

Leasehold Interests (Loan Specific)

When the mortgaged property is encumbered by a ground lease, the rating agencies carefully review the terms and rights of the ground tenant and the landlord. The rating agencies will look to see if the ground owner's rights are subordinate to the leasehold mortgage, as is typical. If the ground lease is not subordinate to the mortgage, the mortgagee should have the right of notice of borrower's default and the ability to cure that default. In addition most mortgage loans will not have a balloon mortgage maturity within 20 years of a ground lease expiry, because that would limit the borrower's economic interest in managing the property and put the mortgagee's principal at risk. To the extent that the rating agency believes a land lease hinders mortgage security, the agency may increase subordination on a loan by 5%-20% to account for the detrimental ground lease. If a ground lease is fully subordinate to the mortgage, there may be no subordination penalty, and penalties greater than 10% are rare, because underwriting standards prevent mortgages with no notice and cure rights.

Property Quality Assessment (Loan Specific)

The agencies will visit and assign a property quality score based on their assessments of the property's location, competition, physical condition, tenancy, and market position. S&P and Moody's use a scale of 1 to 5, with 1 being good and 5 being worst, while Fitch assesses a property grade A through C- with most high-quality pools being assessed a B+, typical conduit pools being B- and poor properties at C or worse. This property score can affect the overall subordination levels by 1%-3%, but usually only account for a 0.5%-1% difference between pools because most recent conduit transactions are of similar quality.

Secondary Financing (Loan Specific)

Many borrowers use secondary financing to leverage their property beyond the limits imposed by the rating agencies' first mortgage guidelines. These secondary loans can take the following forms:

Mezzanine Debt or Preferred Equity

Mezzanine debt is the most common form of additional financing used by borrowers. A mezzanine loan is a loan secured by the equity interests of the first mortgage borrower, so it can only foreclose on the equity in the mortgage borrower, leaving the first mortgage unaffected. Another version of mezzanine financing is a preferred equity interest whereby the borrower issues preferred equity that earns a fixed rate of return and converts to common equity in the borrower SPE if interest payments are deferred.

A/B Note Structures

In the A/B notes structure, one loan is divided into a senior participation interest, which is deposited in the securitization vehicle, while the junior participation interest is privately placed outside of the securitization vehicle. In recent years issuers have used A/B notes to delever larger loans, permitting the A-note to be shadow rated investment grade, improving the CMBS transaction's overall credit levels, and attracting a broader investor base. Investors interested in the implications of A/B notes should read "A/B Note Structures in CMBS Transactions."¹⁸

Second Mortgage Loans

A subordinate mortgage is secured by a lien on the property that is subordinate in priority to the first-mortgage lien. If a second mortgage exists on a property, the rating agencies usually require an inter-creditor agreement that subordinates the second mortgage lender's rights to the first mortgage lender.

Any form of additional property leverage increases the property's obligations, reducing the cash flow available to improve the property and, thus, increasing the first mortgage's probability of default. To reflect this increased default risk, the agencies generally raise the first mortgage's required subordination. Each of the rating agencies has published materials that detail the subordination add-ons created by subordinate financing.

Operating History (Loan Specific)

The cash flow stability of a new property can differ significantly from that of a property that has been in operation for a number of years. Newly developed properties may have many of their leases expire in the same year, leaving significant lease rollover risk if the tenants find that they signed leases that are uneconomic versus justifiable rents for the new untested property. A property that has operated for a number of years has likely stabilized tenant rental levels and diversified tenancy lease expiry over a number of years. Therefore, the rating agencies usually require three years of financial statements to review the property's cash flow stability and adjust their underwritten cash flow based on the property's operating history. Any property that has been newly built and has no operating statement is penalized, while properties that have no statements because they were recently purchased are penalized to a lesser extent.

¹⁸ "A/B Note Structures in CMBS Transactions," Darrell Wheeler, *Bond Market Roundup: Strategy*, Janet Showers, et al., February 18, 2000.

ADDITIONAL INFORMATION AVAILABLE UPON REQUEST

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