

Commercial Real Estate CDOs

Growing new opportunities.

Douglas J. Lucas, Laurie S. Goodman, Frank J. Fabozzi,
and Rebecca J. Manning

DOUGLAS J. LUCAS

is the executive director
and head of CDO
Research at UBS in New
York City.
douglas.lucas@ubs.com

LAURIE S. GOODMAN

is a managing director and
co-head of Global Fixed
Income Research at UBS.
laurie.goodman@ubs.com

FRANK J. FABOZZI

is a professor in the
practice of finance at the
School of Management at
Yale University in
New Haven, CT.
frank.fabozzi@yale.edu

REBECCA J. MANNING

is a vice president at
Harbor Asset Management
in Arlington, VA.
rmanning@harboram.com

Collateralized debt obligations backed by commercial real estate (CRE CDOs) are one of the most efficient vehicles for financing real estate investments. CRE CDOs give traditional real estate asset managers the flexibility to take advantage of opportunities in the real estate market while providing non-recourse financing that matches the average life and interest profile of the underlying asset pool. And as managers are drawn to CRE CDOs for structural flexibility and term financing, investors benefit from exposure to a diverse portfolio of managed CRE assets.

As the CDO market continues to evolve, we see an increasing number of managed CRE CDOs and CRE CDOs backed by commercial real estate loans. While this evolution brings new risks to CRE CDOs, it also provides new opportunities for investors.

We describe CRE CDOs, their evolution, current market trends, and historical performance. We also provide a framework for evaluating CRE CDO investments, and discuss how rating agencies evaluate CRE CDOs.

CRE CDO DEFINED

A collateralized debt obligation represents an issue of debt and equity whose proceeds are used to invest in a portfolio of financial assets. The CDO distributes the cash flows from its asset portfolio to the holders of its various liabilities in prescribed ways that take into account the relative seniority of those liabilities.

Any CDO can be described by focusing on its four important attributes: assets, liabilities, purposes, and credit structures.¹ Like any company, a CDO has assets. In the case of a CDO, these are financial assets. And, like any

company, a CDO has liabilities; these range from preferred shares to AAA-rated senior debt. Beyond the seniority and subordination of CDO liabilities, CDOs have additional structural credit protections, which fall into the category of either *cash flow* or *market value* protection, although all the CRE CDOs now outstanding have only cash flow protections. Finally, every CDO has a purpose it was created to fulfill, and these fall into the categories of *arbitrage*, *balance sheet*, or *origination*.

CRE CDOs are CDOs backed primarily by commercial real estate investments. The most common collateral includes commercial real estate loans (CREL); whole loans and A-notes, B-notes; mezzanine loans; preferred equity; cash and synthetic commercial mortgage-backed securities (CMBS); real estate investment trusts (REITs) (unsecured bonds and trust preferred securities); and other CRE CDOs. The collateral composition of a CRE CDO can vary from just one collateral type, such as whole loans, to a diversified mix of several collateral types. The composition is typically a function of the CDO manager's core investment competencies and investment objectives.

Each type of collateral has its own nuances and investment considerations. CMBS consist of whole loans and A-notes with standard terms: ten-year bullet maturities, fixed rates, and strong prepayment protection. The most important of their well-understood risks are property-specific, asset-specific, and maturity extension risks. CREL, on the other hand, are generally unsuitable for CMBS securitization, and their terms and risks are far from standardized. CREL tend to be floating-rate loans with maturities that range from months to years. They also have little to no prepayment protection.

CRE whole loans in CRE CDOs are typically high-leverage loans, or loans on transitional properties. A transitional property is an underperforming property whose performance and value can be enhanced by improvements made through capital expenditures, by waiting for some improvement in the overall real estate market, by signing new tenants, or by replacing current management. Market values and cash flows of transitional properties tend to be more volatile and more susceptible to local market conditions than those of stabilized properties.

The B-notes and mezzanine loans in CRE CDOs are typically subordinate debt, often on stabilized properties. These loans increase the overall leverage on a property. However, despite their subordinant position, B-notes and mezzanine loans on stabilized properties may have lower leverage and less cash flow volatility than whole loans on transitional properties.

CRE CDOs including other CRE CDOs usually focus on BBB tranches. REIT debt is typically in the form of unsecured bonds issued by large publicly rated REITs. REIT trust preferred securities (TruPS) are hybrid securities that are subordinate to all the issuing REIT's other debt. TruPS in CRE CDOs are typically issued by large publicly rated REITs, but some have been issued by smaller unrated REITs.

MARKET TRENDS

The commercial real estate market's strength in the 1990s spurred demand for all CRE-related products, including CRE CDOs. While still a niche product in the overall CDO market, CRE CDO issuance grew from \$21 billion in 2005 to \$36 billion in 2006, driven by both issuer and investor demand.

CMBS have historically dominated CRE CDO portfolios, but CREL allocations are growing. Previously absent from early CRE CDOs, CREL now account for nearly 50% of newly issued CRE CDOs. And the majority of CREL are floating-rate whole loans. The trend toward CREL allocation adds more asset diversification and more spread to CRE CDOs. At the same time, CREL also introduces new risks, most notably development risk and reinvestment risk.

Some CRE CDOs include small allocations of construction loans, land loans, and condominium- or co-op conversion loans. These loans carry high development risk, along with other third-party risks. The inclusion of riskier collateral in CRE CDOs means investors must depend more on the CDO manager's real estate, underwriting, and management expertise and capabilities. Increased reinvestment risk, along with a more competitive landscape, requires that CDO managers be able to source collateral to replenish the loan pools as loans mature or prepay.

More and more CDO managers have their own in-house loan originators. This provides the CDO with a direct source for replacement collateral, access to loan's borrowers, and more control over the terms of the loan. We are also beginning to see more CRE CDOs backed by synthetic CMBS. Synthetic technology allows managers to source particular vintages, originators, and servicers, taking full advantage of opportunities in the market. CDS on individual loans and other CRE CDOs, as well as property and real estate market derivatives, may further increase the use of synthetics in CRE CDOs.²

Finally, CRE CDOs have entered the global stage. As the spreads for U.S. commercial mortgage loans tighten, managers are looking overseas to source more collateral. European CREL are an even more diverse class than U.S. CREL (with respect to underwriting standards and loan terms), and thus require more thorough due diligence. Yet, Basel II requirements are making it more expensive for banks to invest in European CREL such as B-notes and mezzanine loans. This may remove banks from the CREL market, thus providing ample supply for new CRE CDOs.

CRE FINANCE BEFORE CDOs

Traditional CMBS B-piece buyers were the first to utilize CDO technology as a group. Before CRE CDOs, B-piece buyers would finance their CMBS tranches and other real estate subordinate debt using short-term repurchase agreement financing, earning the spread between the yield on their assets and their cost of funds, even though the risks of repo financing (chiefly basis risk and margin calls) were considerable. The credit pullback caused by the 1998 Russian debt crisis further aggravated B-piece funding problems, forcing B-piece buyers to look for alternative financing sources.

Resecuritized real estate mortgage investment conduit (ReREMIC) structures helped meet the financing needs of some B-piece buyers, providing high-leverage non-recourse term financing needed to make CMBS arbitrage work. Yet this financing vehicle limits B-piece buyers' investment activities. As static pools of CMBS, by statute ReREMICs cannot be managed pools or include non-CMBS assets. While this structure works for some B-piece buyers, the collateral and trading constraints of ReREMICs are too confining for others.

Enter CRE CDOs. Like a ReREMIC, CDOs provide B-piece buyers with long-term, non-mark-to-market, financing, but offer much more flexibility than ReREMICs for two reasons. First, CDOs do not have the same collateral restrictions as ReREMICs. Through a CRE CDO, an issuer can pool several different types of securities, from CMBS tranches to mezzanine loans to synthetics, taking advantage of value opportunities across the real estate market. This feature first caught the eye of B-piece buyers looking for non-mark-to-market financing across all the assets in their portfolios, and it's what drove issuance of static CRE CDOs.

The second reason is that CDOs can be structured as managed pools, allowing issuers to trade portfolios

occasionally and take advantage of market opportunities as they arise. As issuers and investors became more familiar with static CRE CDOs, managed CRE CDOs became more popular. Managed CRE CDOs are attractive to a broader base of traditional commercial real estate investors who want the flexibility to sell or buy new assets. And, by retaining a significant portion of the equity and subordinate tranches of the CDO, issuers maintain control over the portfolio and the equity returns.

As the CRE CDO market continues to develop, new issuers have entered such as asset managers using the CDO structure to increase assets under management. These managers prefer to sell CRE CDO equity to third parties to free up capital. Going forward, we expect to see more traditional real estate investors issuing CRE CDOs, as well as more asset management-oriented issuers.

TYPES OF CRE CDOs

CRE CDOs include an array of different types of collateral. The variability in underlying collateral, and consequently, in underlying risk, makes it difficult to generalize in a discussion of CRE CDOs. Nonetheless, it's helpful to think of CRE CDOs as falling into three major types, based on dominant collateral type: 1) CMBS CDOs (cash and synthetic); 2) CREL CDOs; and 3) REIT TruPS CDOs.

CMBS CDOs fall into two categories, depending on their investment focus: investment-grade CMBS tranches, and high-yield CMBS tranches, including unrated pieces. Typically, CMBS CDOs also allocate 5% to 15% REIT debt. CREL CDOs can also be categorized two ways: those focusing on whole loans, typically rated loans (with a weighted average rating factor (WARF) from 1000 to 2700), and those with a combination of whole loans, B-notes and mezzanine loans, most of them unrated (WARF from 3000 to 6500). REIT TruPS CDOs often include a mix of REIT TruPS and REIT bonds.

Each type of CRE CDO has a different underlying motivation. Investment-grade and high-yield CMBS CDOs capitalize on the strong historical performance of CMBS by leveraging up CMBS tranche investments to create arbitrage. CREL CDOs include loans with less liquidity, less transparency, and greater risk than loans underlying CMBS. Typically, CREL investors must be prepared to become the owner of the underlying property should the property's performance deteriorate. Therefore, CREL CDO managers leverage their real estate expertise to identify and create value. REIT TruPS CDOs exploit the

limited primary and secondary markets for REIT TruPS to generate excess spread.

CRE CDO PERFORMANCE

As of July 2007, only one CRE CDO has ever been downgraded by Standard & Poor's. Since 2004, Fitch has downgraded only one post-2002 issued CRE CDO tranche. Older CRE CDO tranches that Fitch has downgraded were from vintages that included asset-backed security (ABS) collateral. These downgrades were due to the CRE CDOs' holdings of manufactured housing. Manufactured housing collateral has since been eliminated from virtually all 2005- and 2006-vintage CDOs and CMBS.

In 2006, CRE CDOs accounted for 75% of all the structured finance CDO upgraded by Fitch. This strong performance is largely attributable to strong performance and upgrade activity in the underlying CMBS tranches. Fitch cautions that CRE CDOs backed by 2005- and 2006-vintage CMBS will not experience the same positive ratings migration as those backed by earlier vintages, as CMBS subordination levels have fallen due to strong collateral performance.

It is tough to predict future rating performance of CRE CDOs. Estimating default and recovery rates for B-notes, mezzanine loans, and transitional whole loans is difficult, given the scarcity of historical data. The last real estate downturn occurred in the third quarter of 2001, before CDOs began including B-notes, mezzanine loans, and transitional whole loans—so CRE CDO performance is unproven in a difficult environment.

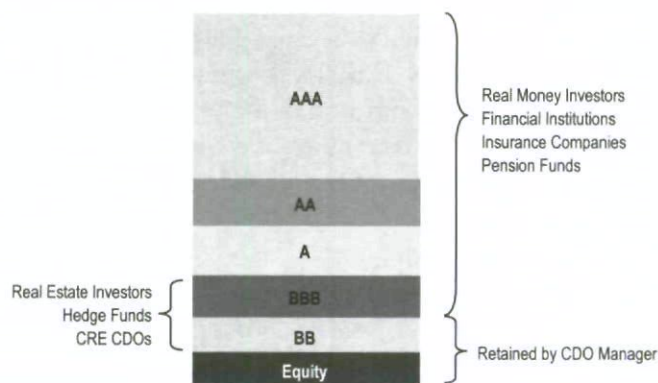
INVESTORS

The Exhibit shows typical CRE CDO investors by tranche. CRE CDO debt investors are similar to investors of other types of CDOs. Real money investors, financial institutions, insurance companies, and so on, tend to buy investment-grade tranches. Hedge funds and other CDOs, particularly CRE CDOs, buy mezzanine tranches. Many of the portfolio managers who invest in CRE CDOs have traditionally invested in commercial real estate investments (i.e., CMBS), rather than other types of CDOs such as collateralized loan obligations (CLOs).

The equity tranche of a CRE CDO is almost always retained by the CDO manager, especially in the case of CRE CDOs. One reason is that the retention of equity serves to align the manager's interests with those of CDO

EXHIBIT

Typical CRE CDO Investors



Source: UBS CDO Research.

debt holders. In the event of a loan default, a manager who retained the CDO's equity has more of an incentive to resolve the defaulted loan in a manner that will minimize losses to the CDO.

The real answer to why managers often retain the equity tranche is that many CRE CDO managers are experienced real estate investors who are using the CDO structure as a financing tool to enhance returns on their real estate portfolio, so they want to retain the equity. When the manager is a REIT, retention of all of the CDO tranches rated below investment-grade is required in order for the CDO's collateral, which appears as assets on the REIT's balance sheet, to qualify as REIT-eligible assets.³

Managers using the CDO structure to increase their assets under management and to generate origination fees are more likely to sell the equity tranche. This is common in CMBS CDOs, where the main motivation for using the CDO structure is arbitrage.

CDO Investors: Same Game, New Collateral

Structurally, CRE CDOs are the same as other types of CDOs, but they differ with respect to their collateral, which is unfamiliar to traditional CDO investors. Because of the single-industry focus, CRE CDO portfolios have historically been considered highly correlated. In fact, CRE CDOs have considerable diversification in the types of loans and securities they hold, and in the underlying property types, tenant concentrations, and geographic locations of their assets. Bottom line: The underlying

collateral is physical, price-appreciating (it is hoped), real estate properties. This point is appealing to investors.

The trick for CDO investors is to understand the underlying collateral and to be comfortable with the CDO manager's capabilities. The level of understanding and comfort is typically a function of the tranche an investor buys. The lower the credit rating of the tranche, the more due diligence the investor should do.

CMBS Investors: New Game, Same-ish Collateral

While a full comparison of CRE CDOs and CMBS/ReREMIC trusts is beyond the scope of this article, we can highlight a few key points here. CDOs are similar to CMBS and ReREMIC trusts in that they all use subordination as a means of credit support. In a CDO, however, credit protection does not stop there. CDOs have cash flow diversion triggers, such as interest coverage (IC) tests and overcollateralization (OC) tests. These triggers protect the senior tranches from credit and cash flow issues before they become major problems by diverting principal and interest away from junior tranches to senior tranches.

The quality and the real estate expertise of the issuer/manager is even more important in CRE CDOs than it is in CMBS and ReREMICs. A CRE CDO manager not only selects the initial collateral pool, but can also trade a bit within the CDO (usually no more than 15% of the pool per year), and can reinvest principal prepayments in new collateral for the first three to five years. Finally, the collateral underlying CRE CDOs and CMBS/ReREMICs is not identical and carries different risks.

CRE CDO CREDIT ANALYSIS

Analysis of a CRE CDO begins with a thorough understanding of the underlying collateral. Ideally, CRE CDO investors should review every security underlying the CDO, but that level of analysis is not always possible, and investors pay fees to the CDO manager to perform that analysis.

Nonetheless, prudent investors will do substantial homework on the underlying properties and loans. Analysis of properties or sponsors that make up a large percentage of the CDO collateral pool will give investors some confidence in the performance of the overall pool. Looking at the debt service coverage ratio (DSCR) and loan-to-value (LTV) ratio of the underlying loans will provide insight into the pool's credit quality. For CDOs

with CMBS tranches, a review of the performance history, including loan delinquencies and defaults, tranche upgrade, and/downgrade history, as well as the largest or riskiest loans in the underlying CMBS portfolio is suggested.

At the bond level, CRE CDO investors look at all the loans and securities in a CDO pool in aggregate, and assess the collateral concentrations. Property type, tenant, geographic, and loan type concentrations are all important pool characteristics impacting the likelihood and correlation of defaults and the severity of default losses. The ratings of the underlying collateral and its weighted average rating factor are important pool characteristics as well. Rating agencies calculate a CDO pool's Herfindahl score, which measures the effective number of assets in the pool, accounting for concentrations due to loan size.⁴

Pool characteristics, WARF, and the Herfindahl score, in conjunction with the pool's overall DSCR and LTV, give indications of the default probabilities, loss severities, and correlations of the underlying pool.

Bond-level analysis also requires cash flow modeling. Cash flow modeling will incorporate the structure of the CDO, including the impact of overcollateralization tests and fast-pay amortization structures. Default and recovery assumptions, as well as default timing, play an important role in cash flow analysis and can significantly alter the bond's expected cash flows.

For investors familiar with CMBS analysis, the collateral underlying some CRE CDOs will involve additional considerations. Default and recovery assumptions of CREL differ from those of typical A-note CMBS collateral. Prepayment risk and interest rate risk, virtually non-existent in CMBS, are also factors in some CRE CDOs.

Finally, CRE CDO analysis is incomplete without assessing the CDO manager. A CRE CDO manager should have strong collateral underwriting practices and, in the event of default, be capable of working out a defaulted loan, or taking control of a poorly performing property. To minimize losses, a manager may need to provide additional funding to turn around a property or cure or buy out the current senior debt, so access to capital is also important.

Furthermore, a managed CDO's collateral pool will change over time. Looking at trading limitations and collateral concentration limitations will help investors understand how much the portfolio can change. A good manager will use trading as an opportunity to improve the collateral pool's quality and risk management. It is

also important for the CDO's allowable collateral concentrations to be consistent with the core competencies of the manager; e.g., if the CDO has a 15% synthetic bucket, the manager should have some expertise in such instruments. And, finally, investors should also consider the ability to source replacement collateral in the future, as competition for good-quality CRE-related securities is likely to increase.

RATING CRE CDOs

The methodology the rating agencies use to rate CRE CDOs is similar to that used for other CDOs. Simulation models generate portfolio default scenarios that, together with recovery rates and other portfolio assumptions, feed into cash flow models to determine required credit support. Before assigning tranche ratings, additional consideration is given to manager quality.

Determining model inputs is where CRE CDO rating methodology differs from rating other types of CDOs. In fact, analyzing CRE CDO collateral is more similar to analyzing CMBS loan collateral. The rating agencies perform loan-level analysis on a majority of assets in the underlying pool (40%–100%), and assess fundamental real estate risk. They use cash flow analysis to calculate a property's "stabilized" net cash flow (NCF) and apply a "stabilized" capitalization rate appropriate for the property to determine the property's value. The value of a property is estimated by dividing the NCF by the property's capitalization rate.

Using the property's value and NCF, a stabilized DSCR and LTV are calculated. Fitch, for example, regards DSCR as the best indicator of a loan's probability of default, and LTV the best indicator of loss severity. It uses those two indicators, and other loan-specific factors such as interest rate risk, amortization, debt thickness, borrower quality, and so on, to determine a loan's expected loss.⁵

Moody's and S&P use cash flow analysis to assign a "shadow rating" to a loan. Moody's shadow rating represents the bottom-dollar default probability of the loan. Therefore, shadow ratings reflect default frequency, not expected loss, as Moody's other ratings address.

In determining a loan's shadow rating (especially for high LTV loans), a property's capital structure is "hyper-tranched," similar to the rating methodology used when rating large-loan CMBS. When a loan is hyper-tranched, it is split into tranches, each with its own rating. For further discussion, see Chapter 10 in Lucas et al. [2007].

A loan's recovery rate is based on type of loan (whole, b-note, mezzanine), property type, and the thickness of the loan as a percent of the property's capital structure. In general, Moody's uses recovery rates of 40%–60% for whole loans, depending on property type. The recovery rates used for CMBS, B-notes, and mezzanine loans vary with the rating and the thickness of the tranche or loan.

For example, the recovery rate on a Ba2 rated B-note with a 20% thickness would be 35%, while a Ba2 B-note with a 5% thickness would have a recovery rate of only 20%. S&P's recovery rates on all CREL are independent of the loan's shadow rating. For example, its CREL recovery rates are 50% for whole loans, 35% for senior B-notes, 30% for first-loss B-notes, and 25% for mezzanine loans. The recovery rates for CMBS tranches are dependent on the CRE CDO and CMBS tranches' ratings.

The collateral recovery rates, combined with collateral shadow ratings (or in the case of Fitch, the loan-level expected losses), are aggregated and fed into simulation models, as are correlation assumptions, to determine portfolio default rates. S&P assumes 10% correlations between CMBS, REITs, and CREL. Intrasector, S&P assumes 30% correlation for CMBS and REITs, and 15% correlation for CREL.

Simulation model results serve as inputs into the CDO's cash flow model. After running stressed cash flow scenarios to determine minimum subordination requirements, the rating agencies adjust the final CDO subordination levels according to their assessment of the CDO manager's quality.

SUMMARY

Commercial real estate is particularly well-suited for CDO collateral, given its strong historical performance. As a result, CRE CDOs have quickly become an accepted part of commercial real estate finance. Issuers are drawn to CRE CDOs for efficient financing, and investors are drawn to the diversification benefits. While they are likely to remain a niche product within the broader CDO market, CRE CDOs are also likely to play a significant role in the commercial real estate market.

NOTES

¹For a more detailed discussion of CDOs, see Lucas, Goodman, and Fabozzi [2006].

²For a discussion of real estate market derivatives, see Geltner and Fisher [2007] and Goodman and Fabozzi [2005].

³To qualify as a REIT, at least 75% of the REIT's asset must be REIT-eligible.

⁴The Herfindahl score, per Moody's, is calculated by dividing 1 by the sum of, for each asset in the pool, the square of (a) the principal balance of each asset in the pool divided by (b) the aggregate principal balance of the assets in the pool.

⁵Debt thickness is the loan's percentage of the property's value. In the event of loan default, a thin debt tranche will likely experience a higher proportionate loss severity than a thicker debt tranche.

REFERENCES

Geltner, David, and Jeffrey Fisher. "Pricing and Index Considerations in Commercial Real Estate Derivatives." *The Journal of Portfolio Management*, Issue on Special Real Estate (2007).

Goodman, Laurie S., and Frank J. Fabozzi. "CMBS Total Return Swaps." *The Journal of Portfolio Management*, Special Issue on Real Estate (2005), pp. 162-167.

Lucas, Douglas J., Laurie S. Goodman, and Frank J. Fabozzi. *Collateralized Debt Obligations: Structures and Analysis*, 2nd ed. Hoboken, NJ: John Wiley & Sons, 2006.

Lucas, Douglas J., Laurie S. Goodman, Frank J. Fabozzi, and Rebecca J. Manning. *Developments in the Collateralized Debt Obligations Markets: New Products and Insights*. Hoboken, NJ: John Wiley & Sons, 2007.

To order reprints of this article, please contact Dewey Palmieri at dpalmieri@ijournals.com or 212-224-3675.

©Euromoney Institutional Investor PLC. This material must be used for the customer's internal business use only and a maximum of ten (10) hard copy print-outs may be made. No further copying or transmission of this material is allowed without the express permission of Euromoney Institutional Investor PLC. Copyright of *Journal of Portfolio Management* is the property of Euromoney Publications PLC and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.

The most recent two editions of this title are only ever available at <http://www.euromoneyplc.com>