

CHAPTER 1

Cash CDO Basics

Collateralized debt obligations (CDOs) have been around since 1987. Yet it was only in 1998 that annual issuance broke \$100 billion. As of 2005, \$1.1 trillion of CDOs were outstanding, making CDOs the fastest-growing investment vehicle of the last decade. This growth is a testament to their popularity among asset managers and investors.

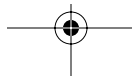
A CDO issues debt and equity and uses the money it raises to invest in a portfolio of financial assets such as corporate loans or mortgage-backed securities. It distributes the cash flows from its asset portfolio to the holders of its various liabilities in prescribed ways that take into account the relative seniority of those liabilities. This is just a starting definition, we will fill in the details for this definition over the next few pages.

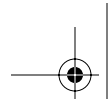
In this chapter, we first make the case that it is worth taking the time to understand CDOs. Then, to properly explain CDOs, we break them down into their four moving parts: assets, liabilities, purposes, and credit structures. We explain each building block in detail and create a framework for understanding CDOs that puts old and new CDO variants in context and cuts through confusing financial jargon. Next, we define the roles of the different parties to a CDO.

WHY STUDY CDOs?

Before we tell you more about CDOs, you should know why it is worth your time to take notice. There are three compelling reasons:

Reason #1: There are a lot of them. As noted earlier, as of 2005 the total amount of CDOs outstanding is \$1.1 trillion. Of course, the mere fact that there is a lot of something is not a recommendation. But the





most desirable thing in the world is not very useful if you cannot get your hands on it. The fact that the supply of CDOs is large and growing means that there are a wide variety of different structures to choose from.

Reason #2: They have unique and attractive return profiles. Via CDOs, investors can gain exposures that they could not otherwise obtain, such as investment-grade risk to speculative-grade assets or speculative-grade risk to investment-grade assets. Investors can get levered exposure to an asset portfolio, or the exact opposite, loss-protected exposure to an asset portfolio. Equity in a CDO achieves nonrecourse term leverage. The debt a CDO issues provides higher spreads than similarly rated instruments. Certain types of CDOs provide upside potential with a limit on downside risk. Others provide a surety of constant returns.

Reason #3: They can improve the return profile of an existing portfolio. CDOs offer access to certain assets that many investors could or would not acquire on their own, thereby improving portfolio diversity. CDOs come with built-in diversification and most come with built-in asset management. CDO returns have low correlation to returns of other assets.

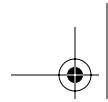


UNDERSTANDING CDOs

“Collateralized debt obligations,” “arbitrage cash flow CDOs,” and “collateralized loan obligations” are similar phrases that could refer to the same type of CDO or to very different types of CDOs. “Structured finance CDOs,” “ABS CDOs,” and “resecuritizations” are three distinct names all referring to the same type of CDO. The phraseology gets worse with idioms such as “CDO squared” and the perfectly logical expression (once you understand it) “the CDO issues CDOs.” Like most finance terms, the emphasis of CDO nomenclature is to distinguish new products from existing products. This often happens at the expense of logical categorization.

Any CDO can be well described by focusing on its four important attributes: assets, liabilities, purposes, and credit structures. Like any company, a CDO has assets. With a CDO, these are financial assets such as corporate loans or mortgage-backed securities. And like any company, a CDO has liabilities. With a CDO, these run the gamut of 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* protections. Finally, every CDO has a purpose that it was created to fulfill, and these fall into the categories of *arbitrage*, *balance sheet*, or *origination*. In this chapter, we are going to look at the different types of assets CDOs hold, the different types of liabilities CDOs issue, the two different credit structures CDOs employ, and at the three purposes for which CDOs are created.

Assets

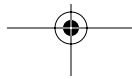
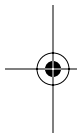
CDOs own financial assets such as corporate loans or mortgage-backed securities. A CDO is primarily identified by its underlying assets.

The first CDOs created in 1987 owned high-yield bond portfolios. In fact, before the term “CDO” was invented to encompass an ever-broadening array of assets, the term in use was “collateralized bond obligation” or “CBO.” In 1989, corporate loans and real estate loans were used in CDOs for the first time, causing the term “collateralized loan obligation” or “CLO” to be coined. Generally, CLOs are comprised of performing high-yield loans, but a few CLOs, even as far back as 1988, targeted distressed and nonperforming loans. Some cash CLOs comprised of investment-grade loans have also been issued.

Loans and bonds issued by emerging market corporations and sovereign governments were first used as CDO collateral in 1994, thus “emerging market CDO” or “EM CDO.” In 1995, CDOs comprised of residential mortgage-backed securities (RMBS) were first issued. CDOs comprised of commercial mortgage-backed securities (CMBS) and asset-backed securities (ABS), or combinations of RMBS, CMBS, and ABS followed but they have never found a universally accepted name. In this book, we use “structured finance CDO” or “SF CDO.” However, Moody’s champions the term “resecuritizations” and many others use “ABS CDO,” even to refer to CDOs with CMBS and RMBS in their collateral portfolios.

It is noteworthy that the collateral diversity we have described so far, between 1987 through 1995, occurred while annual CDO issuance averaged \$2 billion and never exceeded \$4 billion. As shown in Exhibit 1.1, CDO issuance only really took off in 1996. Issuance jumped to \$38 billion in 1996, \$82 billion in 1997, and \$139 billion in 1998.

The decline in CDO issuance in 2001 and 2002 was due to a difficult corporate credit environment. As a result, corporate bond and loan-backed CDO issuance fell 50% from \$100 billion in 2000 to \$50 billion in 2002. Since 2002, the steady annual increases in CDO issuance has been fueled by high-yield loan-backed CLOs and SF CDOs. As shown in Exhibit 1.2, these collateral types underlie 91% of CDOs issued thus far



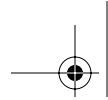


EXHIBIT 1.1 Annual Cash CDO Issuance

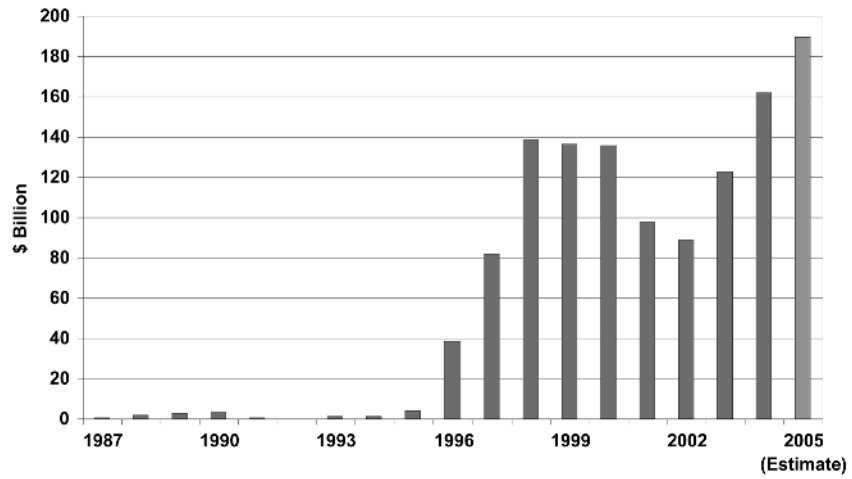
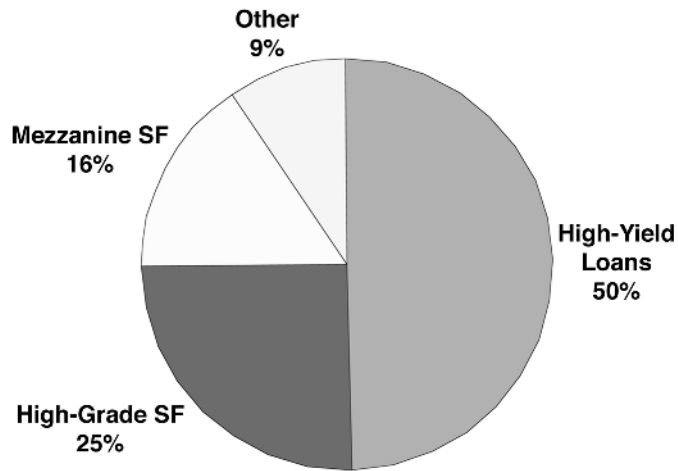
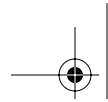


EXHIBIT 1.2 Collateral Backing Cash CDOs in 2005





in 2005. Also shown in Exhibit 1.2 is the distinction between mezzanine assets—BBB— and A rated SF—and high-grade AA— and AAA rated SF assets. While mezzanine SF securities have been used in CDOs in quantity as far back as 1998, higher rated SF securities debuted in CDOs in 2003. The majority of the “other” category in the exhibit is comprised of capital notes from banks and insurance companies. CDOs backed by these assets were first issued in 2000. Emerging market debt and high-yield bonds make up most of the remainder of the “other” category in Exhibit 1.2.

The CDO market is opportunistic in the way it drops collateral types that are out of favor with investors and picks up collateral types that are in favor with investors. The best example of this is the switch out of poor-performing high-yield bonds and into well-performing high-yield loans between 2001 and 2003. Also, certain types of ABS present in SF CDOs from 1999 through 2001 disappeared from later vintages: manufactured housing loans, aircraft leases, franchise business loans, and 12b-1 mutual fund fees. All of these assets had horrible performance in older SF CDOs. In their place, SF CDOs have recently focused more on RMBS and CMBS.

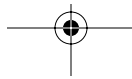
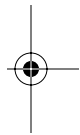
Liabilities

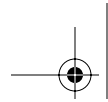
Any company that has assets also has liabilities. In the case of a CDO, these liabilities have a detailed and strict ranking of seniority, going up the CDO’s capital structure as equity or preferred shares, subordinated debt, mezzanine debt, and senior debt. These *tranches* of notes and equity are commonly labeled Class A, Class B, Class C, and so forth going from top to bottom of the capital structure. They range from the most secured AAA rated tranche with the greatest amount of subordination beneath it, to the most levered, unrated equity tranche. Exhibit 1.3 shows a simplified tranche structure for a CLO.

Special purposes entities like CDOs are said to be “bankrupt remote.” One aspect of the term is that they are new entities without

EXHIBIT 1.3 Simple, Typical CLO Tranche Structure

Tranche	Percent of Capital Structure	Rating	Coupon
Class A	77.5	AAA	LIBOR + 26
Class B	9	A	LIBOR + 75
Class C	2.75	BBB	LIBOR + 180
Class D	2.75	BB	LIBOR + 475
Preferred shares	8	NR	Residual cash flow





previous business activities. They therefore cannot have any legal liability for sins of the past. Another aspect of their “remoteness from bankruptcy” is that the CDO will not be caught up in the bankruptcy of any other entity, such as the manager of the CDO’s assets, or a party that sold assets to the CDO, or the banker that structured the CDO.

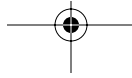
Another, very important aspect of a CDO’s bankruptcy remoteness, is the absolute seniority and subordination of the CDO’s debt tranches to one another. Even if it is a certainty that some holders of the CDO’s debt will not receive their full principal and interest, cash flows from the CDO’s assets are still distributed according to the original game plan dictated by seniority. The CDO cannot go into bankruptcy, either voluntarily or through the action of an aggrieved creditor. In fact, the need for bankruptcy is obviated because the distribution of the CDO’s cash flows, even if the CDO is insolvent, has already been determined in detail at the origination of the CDO.

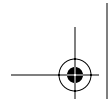
Within the stipulation of strict seniority, there is great variety in the features of CDO debt tranches. The driving force for CDO structurers is to raise funds at the lowest possible cost. This is done so that the CDO’s equity holder, who is at the bottom of the chain of seniority, can get the most residual cash flow.

Most CDO debt is floating rate off LIBOR, but sometimes a fixed rate tranche is structured. Avoiding an asset-liability mismatch is another reason why floating-rate high-yield loans are more popular in CDOs than fixed-rate high-yield bonds. Sometimes a CDO employs short-term debt in its capital structure. When such debt is employed, the CDO must have a standby liquidity provider, ready to purchase the CDO’s short-term debt should it fail to be resold or roll in the market. A CDO will only issue short-term debt if its cost, plus that of the liquidity provider’s fee, is less than the cost of long-term debt.

Sometimes a financial guaranty insurer will wrap a CDO tranche. Usually this involves a AAA rated insurer and the most senior CDO tranche. Again, a CDO would employ insurance if the cost of the tranche’s insured coupon plus the cost of the insurance premium is less than the coupon the tranche would have to pay in the absence of insurance. To meet the needs of particular investors, sometimes the AAA tranche is divided into *senior* AAA and *junior* AAA tranches.

Some CDOs do not have all their assets in place when their liabilities are sold. Rather than receive cash the CDO is not ready to invest, tranches might have a delay draw feature, where the CDO can call for funding within some specified time period. This eliminates the negative carry the CDO would bear if it had to hold uninvested debt proceeds in cash. An extreme form of funding flexibility is a revolving tranche, where the CDO can call for funds and return funds as its needs dictate.





Purposes

CDOs are created for one of three purposes:

Balance Sheet. A holder of CDO-able assets desires to (1) shrink its balance sheet, (2) reduce required regulatory capital, (3) reduce required economic capital, or (4) achieve cheaper funding costs. The holder of these assets sells them to the CDO. The classic example of this is a bank that has originated loans over months or years and now wants to remove them from its balance sheet. Unless the bank is very poorly rated, CDO debt would not be cheaper than the bank's own source of funds. But selling the loans to a CDO removes them from the bank's balance sheet and therefore lowers the bank's regulatory capital requirements. This is true even if market practice requires the bank to buy some of the equity of the newly created CDO.

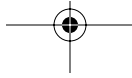
Arbitrage. An asset manager wishes to gain assets under management and management fees. Investors wish to have the expertise of an asset manager. Assets are purchased in the marketplace from many different sellers and put into the CDO. CDOs are another means, along with mutual funds and hedge funds, for an asset management firm to provide its services to investors. The difference is that instead of all the investors sharing the fund's return in proportion to their investment, investor returns are also determined by the seniority of the CDO tranches they purchase.

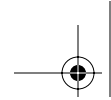
Origination. Banks and insurance companies wish to increase equity capital. Here, the example is a large number of smaller-size banks issuing capital notes¹ directly to the CDO simultaneous with the CDO's issuance of its own liabilities. The bank capital notes would not be issued but for the creation of the CDO to purchase them.

Three purposes differentiate CDOs on the basis of how they acquire their assets and focus on the motivations of asset sellers, asset managers, and capital note issuers. From the point of view of CDO investors, however, all CDOs have a number of common purposes, which explain why many investors find CDO debt and equity attractive.

One purpose is the division and distribution of the risk of the CDO's assets to parties that have different risk appetites. Thus, a AAA investor can invest in speculative-grade assets on a loss-protected basis. Or a BB investor can invest in AAA assets on a levered basis.

¹ Capital notes are unsecured obligations that are generally ranked lowest in the order of repayment.



**EXHIBIT 1.4** CDO Spreads versus Alternative Investments, August 2005

	CLO	SF CDO	Corporates	CMBS	Home Equity	Credit Card	Manf. House
AAA	26	Senior 27 Junior 46	23	26	25	8	67
AA	41	58		45	49		
A	73	145	33	54	65	24	
BBB	178	270	100	110	136	42	
BB	475						

Source: UBS, Salomon Yield Book.

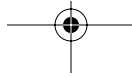
For CDO equity investors, the CDO structure provides a leveraged return without some of the severe adverse consequences of borrowing via repo from a bank. CDO equity holders own stock in a company and are not liable for the losses of that company. Equity's exposure to the CDO asset portfolio is therefore capped at the cost of equity minus previous equity distributions. Instead of short-term bank financing, financing via the CDO is locked in for the long term at fixed spreads to the London interbank offered rate (LIBOR).

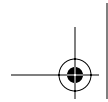
For CDO debt investors, CDOs offer spreads that are usually higher than those of alternative investments, particularly for CDOs rated below AA, as shown in Exhibit 1.4. And finally, the CDO structure allows investors to purchase an interest in a diversified portfolio of assets. Often these assets are not available to investors except through a CDO. Exhibit 1.5 summarizes the CDO purposes that we have discussed.

CREDIT STRUCTURES

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* protections.

The *market value credit structure* is less often used, but easier to explain, since it is analogous to an individual's margin account at a brokerage. Every asset in the CDO's portfolio has an *advance rate* limiting the amount that can be borrowed against that asset. Advance rates are necessarily less than 100% and vary according to the market value volatility of the asset. For example, the advance rate on a fixed rate B rated bond would be far less than the advance rate on a floating rate AAA-rated bond. Both the rating and floating rate nature of the AAA bond

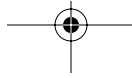


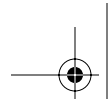
**EXHIBIT 1.5** CDO Purposes

	Balance Sheet	Arbitrage	Origination
Provide asset sellers with cheap funding or regulatory capital relief or economic capital relief	X		
Provide asset managers with assets under management and CDO investors with asset management services		X	
Provide banks and insurance companies with cheap equity-like capital			X
Divide and distribute the risk of the CDO assets to parties with differing appetites for risk	X	X	X
Provide equity investors with leveraged exposure to the CDO's assets with non-recourse term financing	X	X	X
Provide debt investors with high ratings-adjusted yields	X	X	X
Provide investors with a diversified investment portfolio, perhaps of hard-to-access assets	X	X	X

indicate that its market value will fluctuate less than the B rated bond. Therefore, the CDO can borrow more against it. The sum of advance rates times the market values of associated assets is the total amount the CDO can borrow.

The credit quality of a market value CDO derives from the ability of the CDO to liquidate its assets and repay debt tranches. Thus, the market value of the CDO's assets are generally measured every day, advance rates applied, and the permissible amount of debt calculated. If this comes out, for example, to \$100 million, but the CDO has \$110 million of debt, the CDO must do one of two things. It can sell a portion of its assets and repay a portion of its debt until the actual amount of debt is less than the permissible amount of debt. Or the CDO's equity holders can contribute more cash to the CDO. If no effective action is taken, the entire CDO portfolio is liquidated, all debt is repaid, and residual cash given to equity holders. The market value credit structure is analogous to an individual being faced with a collateral call at his (or her) brokerage account. If he does not post additional collateral, his portfolio is at least partially liquidated.





The *cash flow credit structure* does not have market value tests. Instead, subordination is sized so that the *after-default cash flow* of assets is expected to cover debt tranche principal and interest with some degree of certainty. Obviously, the certainty that a AAA CLO tranche, with 23% subordination beneath it, will receive all its principal and interest is greater than the certainty a BB CLO tranche, with only 8% subordination beneath it, will receive all its principal and interest.

All cash flow CDOs have a feature that improves the credit quality of their senior tranches. In the normal course of events, if defaults are not “too high” (a phrase we will shortly explain in detail), cash coupons come in from the CDO’s asset portfolio. These dollars are first applied to the CDO’s administrative costs, such as those for its trustee and its manager, if it has one. Next, these moneys are applied to interest expense of the CDO’s senior-most tranche. Next, moneys are applied to interest expense on the CDO’s second most senior tranche and successively moving down the capital structure until all interest on all debt tranches is paid. If the CDO has a manager, an additional fee to that manager might be paid next. Finally, left over, or residual, cash flow is given to the CDO’s equity holders.

What if defaults are “too high” (as we promised earlier to explain)? Also, how do we know whether defaults are too high? There are two series of tests, the most important of which is shown below. The key to these tests is that defaulted assets are excluded or severely haircut (counted at a fraction of their par amount) in the definition of “asset par.”

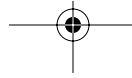
Class A par coverage test = Asset par/Class A par

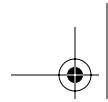
Class B par coverage test = Asset par/(Class A par + Class B par)

Class C par coverage test = Asset par/(Class A par + Class B par + Class C par)

... and so on, for all the debt tranches

To pass these tests, par coverage must be greater than some number, perhaps 120% for the Class A par coverage test, perhaps only 105% for the Class C par coverage test. The more defaulted assets a CDO has, the more likely it will be to fail one or more of these tests. Failure of a par coverage test requires that cash be withheld from paying interest on lower-ranking debt tranches. Instead, cash must be used to pay down principal on the CDO’s senior-most debt tranche. If enough cash is available to pay down the senior-most tranche so that the par coverage test is in compliance, remaining cash can be used to make interest payments to lower-ranking tranches and on down the line to the CDO’s





equity holders. We discuss the cash flow credit structure in much more depth in Chapter 2.

A CDO STRUCTURAL MATRIX

Exhibit 1.6 shows the four CDO building blocks and a variety of options beneath each one. Any CDO can be well described by asking and answering the four questions implied by the exhibit:

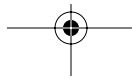
- What are its assets?
- What are the attributes of its liabilities?
- What is its purpose?
- What is its credit structure?

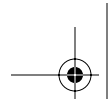
This way of looking at CDOs encompasses all the different kinds of CDOs that have existed in the past and all the kinds of CDOs that are currently being produced. For example, the first CDO ever created, back in 1987, had high-yield bond assets, fixed rate debt, a market value credit structure, and was done for balance sheet purposes.² We will make further use of this CDO classification system as we turn to the most common types of CDOs offered today.

EXHIBIT 1.6 CDO Structural Matrix

Assets	Liabilities	Purpose	Credit Structure
High-yield loans	Fixed/floating rate	Arbitrage	Cash flow
High-grade structured finance	PIK/non-PIK	Balance sheet	Market value
Mezzanine structured finance	Guaranteed/unenhanced	Origination	
Capital notes	Short term/long term		
High-yield bonds	Delayed draw/revolving		
Emerging market debt			

² Imperial Savings' September 1987 issue, managed by Caywood Christian, underwritten by Drexel Burnham, and rated by S&P.



**CDOs BEING OFFERED TODAY**

In Exhibit 1.2, we showed that 91% of CDOs issued so far in 2005 are backed by high-yield loans and structured finance (ABS, CMBS, RMBS) assets. Most of these CDOs, as well as the comparatively few CDOs backed by high-yield bonds, investment-grade bonds, and emerging market bonds, use the cash flow credit structure and were done for arbitrage purposes. Exhibit 1.7 shows 2005 CDO issuance by purpose, credit structure, and assets. Note that 81% of CDOs issued in 2005 have been arbitrage cash flow CDOs backed by various types of assets. This is clearly the dominant structure.

PARTIES TO A CDO

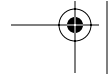
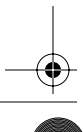
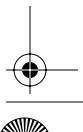
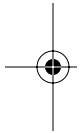
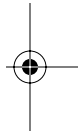
A number of parties and institutions contribute to the creation of a CDO. We conclude this introductory chapter with a discussion of the most important roles.

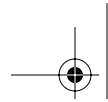
CDO Issuer and Co-Issuer

A CDO is a distinct legal entity, usually incorporated in the Cayman Islands. Its liabilities are called CDOs, so one might hear the seemingly circular phrase “the CDO issues CDOs.” Offshore incorporation enables the CDO to more easily sell its obligations to United States and international investors and escape taxation at the corporate entity level. When a CDO is located outside the U.S., it will typically also have a Delaware co-issuer. This entity has a passive role, but its existence in the structure allows CDO obligations to be more easily sold to U.S. insurance companies.

EXHIBIT 1.7 CDO Issuance in 2005

Purpose	Credit Structure	Assets	Share
Arbitrage	Cash flow	HY loans	40%
Arbitrage	Cash flow	HG SF	18%
Arbitrage	Cash flow	Mezz. SF	15%
Arbitrage	Cash flow	Bonds, other	8%
Origination	Cash flow	Capital notes	6%
Balance sheet	Cash flow	Various	8%
Arbitrage	Market value	Various	5%





Asset Manager (Collateral Manager)

Asset managers (or *collateral managers*) select the initial portfolio of an arbitrage CDO and manage it according to prescribed guidelines contained in the CDO's *indenture*. Sometimes an asset manager is used in a balance sheet CDO of distressed assets to handle their workout or sale. A variety of firms offer CDO asset management services including hedge fund managers, mutual fund managers, and firms that specialize exclusively in CDO management.

Asset Sellers

Asset sellers supply the portfolio for a balance sheet CDO and typically retain its equity. In cash CDOs, the assets involved are usually smaller-sized loans extended to smaller-sized borrowers. In the United States, these are called "middle market" loans and in Europe these are called "small and medium enterprise" (SME) loans.

Investment Bankers and Structurers

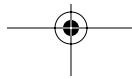
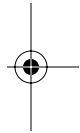
Investment bankers and *structurers* work with the asset manager or asset seller to bring the CDO to fruition. They set up corporate entities, shepherd the CDO through the debt rating process, place the CDO's debt and equity with investors, and handle other organizational details. A big part of this job involves structuring the CDO's liabilities: their size and ratings, the cash diversion features of the structure, and, of course, debt tranche coupons. To obtain the cheapest funding cost for the CDO, the structurer must know when to use short-term debt or insured debt or senior/junior AAA notes, to name just a few structural options. Another part of the structurer's job is to negotiate an acceptable set of eligible assets for the CDO. These tasks obviously involve working with and balancing the desires of the asset manager or seller, different debt and equity investors, and rating agencies.

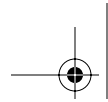
Insurers/Guarantors

Monoline bond insurers or *financial guarantors* typically only guarantee the senior-most tranche in a CDO. Often, insurance is used when a CDO invests in newer asset types or is managed by a new CDO manager.

Rating Agencies

Rating agencies approve the legal and credit structure of the CDO, perform due diligence on the asset manager and the trustee, and rate the various seniorities of debt issued by the CDO. Usually two or three of the major rating agencies (Moody's, S&P, and Fitch) rate the CDO's





debt. DBRS is a recent entrant in CDO ratings and A. M. Best has rated CDOs backed by insurance company capital notes.

Trustees

Trustees hold the CDO's assets for the benefit of debt and equity holders, enforce the terms of the CDO indenture, monitor and report upon collateral performance, and disburse cash to debt and equity investors according to set rules. As such, their role also encompasses that of collateral custodian and CDO paying agent.

