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Ratings

BSL CLO Primer

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This report does not constitute a rating action

Primary Contacts

Stephen Anderberg
Catherine Rautenkranz
David Postilion

Analytical Managers

Jimmy Kobylinski
Belinda Ghetti
Emanuele Tamburrano

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What Is A CLO?

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Collateralized loan obligations (CLOs) are structured finance transactions backed by a pool of loans to speculative-grade companies across different industry sectors. There are two primary types of CLOs: broadly syndicated loan (BSL) CLOs collateralized mostly by loans to rated issuers in the BSL loan market, and middle market (MM) CLOs collateralized mostly by loans to smaller, often unrated, obligors in the direct lending market. We cover these transactions in detail in a separate primer (see "Good Things Come In Small Packages: A Short Primer On Middle Market CLOs," published March 27, 2025).

The global CLO market covers the U.S. and Europe and, as of April 2025, totals a bit more than $1.33 trillion in size, according to the BofA Global Research. U.S. BSL CLOs are the largest segment, with more than $930 billion outstanding, and hold around two-thirds of the outstanding loans in the $1.4 trillion U.S. BSL loan market. The European CLO market is roughly $270 billion (USD) in size and holds a comparable proportion of the European loan market. Separate from these are MM CLOs, which, in the U.S., has about $131 billion outstanding. In Europe, the MM CLO segment is nascent, having seen its first transaction in November 2024.

CLOs issue different classes of notes and equity, which are purchased by various types of investors with different levels of risk appetite. The senior-most notes issued by the CLO, typically rated 'AAA (sf)', are often purchased by domestic U.S. bank treasury departments, insurance companies, or Japanese banks. Lower-rated classes of notes, typically rated 'AA (sf)' through 'BB (sf)' (and sometimes 'B (sf)'), are purchased by a mix of investors including insurance companies, asset managers, regional banks, hedge funds, and others. The CLO equity, which is the highest risk part of the capital stack, is the first to suffer losses when CLO collateral comes under stress, but it can offer high levels of reward to investors. CLO equity may be held by the CLO managers who issue the transaction, by specialized investment funds in the U.S. or elsewhere, or others.

When a new CLO is issued and sells its notes, the net proceeds are used to invest in loans (and to a much lesser extent, bonds) as collateral to back the CLO notes. CLOs utilize special-purpose entities (SPEs) to hold the underlying collateral and issue the notes and equity to protect the CLO from bankruptcy-related risks that could arise from various parties involved with the transaction. Most CLOs are actively managed, with a CLO manager who assembles the initial portfolio and buys, sells, and substitutes assets during a CLO's reinvestment period. These asset purchases and sales are subject to predetermined rules set forth in a governing indenture and/or offering memorandum negotiated by the parties to the CLO (including the manager, noteholders and equityholders) when a new CLO transaction is created.

Each CLO also has a trustee, who makes sure the transaction operates in accordance with these rules and who handles a range of operational tasks like ensuring the noteholders are paid the appropriate amounts on each of the payment dates. CLOs use the interest and principal they receive from the collateral assets they hold to cover the principal and interest owed to the CLO noteholders on each payment date. For the economics of the CLO transaction to work, the interest income from the loan portfolio should exceed the interest owed on the CLO notes, with the excess (residual) interest being paid to the CLO equityholders.

Every transaction is different. In table 1, we provide a hypothetical example of a $400 million U.S. BSL CLO, with a structure and spreads that are typical as of late 2024.

Table 1

Example of a typical U.S. BSL CLO structure (late 2024)

Class	Rating	Tranche size (mil. $)	Thickness (%)	Subordination (%)	Spread (%)(i)
A	AAA (sf)	256	64	36	Three-month SOFR + 1.36
B	AA (sf)	48	12	24	Three-month SOFR + 1.73
C (deferrable)	A (sf)	24	6	18	Three-month SOFR + 1.98
D (deferrable)	BBB (sf)	24	6	12	Three-month SOFR + 3.01
E (deferrable)	BB (sf)	16	4	8	Three-month SOFR + 5.90
Subordinated notes (equity)	NR	32	8	0	Residual

CLO--Collateralized loan obligation. BSL--Broadly syndicated loan. NR--Not rated. N/A--Not applicable. (i)Source: Pitchbook LCD trailing three-month U.S. CLO tranche spreads as of November 2024.

The weighted average spread (WAS) of the loans in our hypothetical CLO portfolio is the three-month benchmark rate SOFR plus 3.50%, which is higher than the weighted average cost of debt for the CLO capital structure (SOFR plus 1.71%). The positive spread differential between the spread the CLO receives from its assets and the spread it pays on its liabilities each quarter is sometimes referred to as the excess spread. If it isn't large enough, the projected equity returns won't be high enough to attract an investor for our new issue CLO's equity notes, and the transaction may not happen.

Sometimes, however, prospective equity holders will accept a suboptimal return profile on day one in order to lock in attractive CLO financing costs and hope that something causes loan prices to drop or loan spreads to increase. This can allow the CLO manager to buy assets a discount to par or increase the WAS profile of the CLO collateral, potentially generating outsized returns for the CLO equityholders.

On each quarterly CLO payment date, interest on the CLO's rated notes will be paid, and the difference between the 3.50% and the 1.71%, minus fees (including collateral manager fees and transaction expenses), will be distributed to the CLO equity. Given the roughly 12 times leverage for the CLO equity class in our example, this would give our CLO equity a projected annual return in the mid-teens. Other features, such as a release of some excess par on the first payment date (a "par flush") can further enhance and front-load the equity returns. But with these projected returns comes risk--bear in mind that the CLO equity is first in line to suffer losses if the CLO's collateral experiences defaults or other losses.

In a sense, you can think of the CLO equityholders as borrowing money from each class of the rated noteholders (at the spread applicable to that tranche) to fund the purchase of the portfolio of loans. The funding provided to the equity by the CLO noteholders is term financing, with a spread over a benchmark (SOFR) locked in for a period (typically two years) referred to as the non-call period. After the non-call period has concluded, the manager or equityholders can call the CLO notes and re-issue them at tighter credit spreads if market conditions change in that direction.

Assuming the loan pool performs well, when the transaction reaches the end of its lifespan (or resets or refinances) the debtholders are paid back their promised amounts, and the equityholders get what’s left over. If the loan pool doesn't perform well (e.g., corporate default rates increase significantly or many companies see their ratings lowered into the 'CCC' range), the equityholders can get shut off from receiving interest distributions temporarily or even lose their entire principal. Under most market environments, it’s common for CLOs to experience a modest amount of par burn each year due to asset defaults or sale of assets by the manager at less than par.

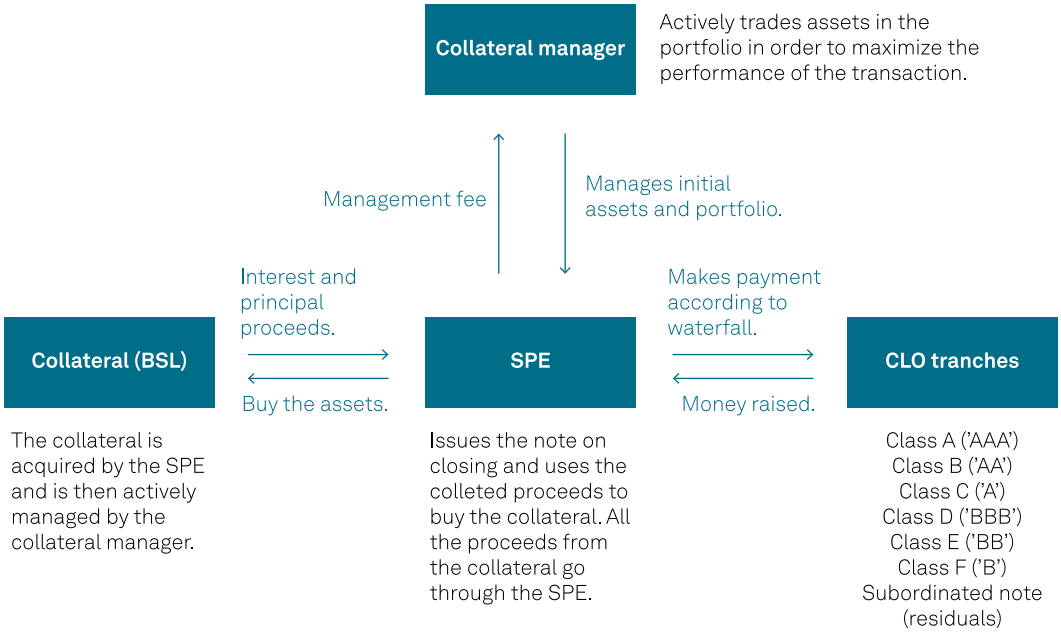
Doesn't make sense yet? Don't worry, we're going to explain each of the components in some detail.

Now that we know the general definition and basic purpose of a CLO, let's dive into the structure of a typical CLO transaction. In the following sections, we'll define the different parties involved in the transaction, summarize the structures and key features of a CLO transaction, and provide an overview of the collateral usually found in a CLO portfolio.

Chart 1 shows a typical structure of a CLO transaction.

Chart 1

The typical structure of a CLO transaction



BSL—Broadly syndicated loan. SPE—Special-purpose entity. Source: S&P Global Ratings.

What Are Broadly Syndicated Loans?

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As described above, CLO issuers are securities backed by a pool of loans, usually senior secured BSLs from various industry sectors. Most BSL CLOs have highly diverse portfolios. The average U.S. BSL CLO holds loans from more than 300 companies across something like two dozen industry categories. In aggregate, U.S. BSL CLOs hold loans from about 1,600 companies, with the top 250 of these companies representing about half of the total assets within the CLOs by par value of the loans held. The average position size within a U.S. BSL CLO is often 0.50% or less of the total portfolio. European CLO collateral pools have fewer obligors, but are still fairly diverse (see slide 16 in "U.S. And European BSL CLOs: A Comparative Overview (2024 Update)," published May 23, 2024).

Table 2 below shows the top 10 companies and their respective industries found in U.S. BSL CLO portfolios as of fourth-quarter 2024 (from "U.S. BSL CLO Top Obligors and Industries Report: Fourth-Quarter 2024," published Jan. 13, 2025, which is updated quarterly).

Table 2

Top 10 obligors held in U.S. BSL CLOs (Q4 2024)

Rank	Issuer name	Parent issuer name	GICS industry Code
1	Asurion LLC	Asurion Group Inc.	IT services
2	Transdigm Inc.	TransDigm Inc.	Aerospace and defense
3	Medline Borrower L.P.	Medline Borrower L.P.	Healthcare providers and services
4	Peraton Corp.	Peraton Corp.	IT services
5	Virgin Media Bristol LLC	Liberty Global PLC	Diversified telecommunication services
6	Caesars Entertainment Inc.	Caesars Entertainment Inc.	Hotels, restaurants, and leisure
7	Cloud Software Group Inc.	Balboa Intermediate Holdings LLC	IT services
8	Acrisure LLC	Acrisure Holdings Inc.	Insurance
9	Allied Universal Holdco LLC	Atlas Ontario L.P.	Commercial services and supplies
10	Athenahealth Group Inc.	Athenahealth Group Inc.	Health care technology

GICS--Global Industry Classification Standard. Source: S&P Global Ratings.

For example, a portion of a loan issued by Asurion will be purchased by the CLO manager and transferred into the CLO's SPE. Investors in the CLO will thereby be exposed to the performance of this loan/company. Position sizes within a given CLO vary, but are often several million dollars per obligor.

S&P Global Ratings' methodology for rating CLOs uses the issuer credit rating (ICR) on the company issuing the loan (which indicates relative default risk) and the recovery rating on each piece of debt (which indicates the debt's expected recovery in a default scenario), among other factors we will get into shortly, as key inputs in evaluating the quality of a CLO portfolio and its expected cash flows.

First things first, what is a syndicated loan?

A syndicated loan is a loan extended to a company by a group of lenders that is structured, arranged, and administered by one or several investment banks. When a syndicated loan is held by a large number of lenders, it is considered broadly syndicated. This is different from loans to companies in the private credit space, which are normally direct loans (one lender to one borrower) or club deals (several lenders to one borrower).

As of late 2024, the U.S. BSL market was about $1.4 trillion in size (per Pitchbook LCD), and U.S. BSL CLOs held more than two-thirds of this in their collateral pools. Nearly all of the companies that issue loans into the BSL market have speculative-grade ('BB+' or lower) ratings, and companies with ratings in the 'B' category ('B+', 'B', and 'B-') represent about 68% of the assets in U.S. BSL CLOs and 84% of the assets in European CLOs (see slide 11 in "U.S. And European BSL CLOs: A Comparative Overview (2024 Update)," published May 23, 2024).

Syndicated loans (often also referred to as 'leveraged loans') loans are typically secured (collateralized) by a first-priority security interest (first lien) in the borrower's assets, though certain assets may not be pledged as collateral and some loans have junior-lien positions. Borrowers may use leveraged loans to refinance existing debt or to fund operations, while private equity sponsors may use leveraged loans issued by companies to fund M&A activity or do a leveraged buyout (LBO).

The Typical CLO Portfolio

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A typical loan in a BSL CLO portfolio has the following characteristics

- An issuer credit rating anywhere in the speculative-grade range ('BB+' or lower), but mostly in the 'B' range;
- A recovery rating in the 2 or 3 range, indicating an expected recovery of 50%-70% if the company issuing the loan were to default;
- Status as a senior secured loan facility;
- A maturity of approximately five to six years from time of issuance; and
- Generally, floating-rate interest payments with a credit spread somewhere between 3%-5% over the benchmark rate.

Most CLO transactions allow collateral managers to reinvest principal cash received from assets that have been sold, or have paid down, into new assets during a specified reinvestment period that spans the first five years of a new issue CLO transaction's life (see The Typical CLO Lifecycle section below). Because the collateral manager can actively manage the loan portfolio during this period, CLO transactions have multiple tests that set minimum standards for the portfolio. These tests fall into two broad categories: concentration limitation tests and collateral quality tests, both described below.

Typical concentration limitations

Most BSL CLOs are actively managed, and the composition of the collateral pool can change over time. Because of this, CLO transaction documents contain concentration limitations, which put guardrails around the manager's ability to alter the portfolio through trades. These limitations are colloquially referred to as "buckets," and each represents a percentage of the total portfolio. For example, a fixed-rate bucket of 5% indicates that no more than 5% of the total portfolio may consist of debt instruments that pay a fixed coupon instead of a floating spread.

We often see the following limitations in BSL CLO transaction documents:

- Fixed-rate asset bucket: Typically limited to 5%-10% of total collateral for U.S. CLO transactions, and up to 20% for European CLO transactions. This is intended to limit the interest rate mismatch between the collateral assets and the (mostly) floating-rate CLO tranche liabilities. Historically, U.S. CLOs have made little use of these, but this changed somewhat in 2022 and 2023 when the advent of higher interest rates presented managers with an opportunity to purchase fixed-rate assets at a discount to par. However, fixed-rate assets still comprise only a small proportion of overall U.S. CLO assets. Exposure in European CLOs is somewhat higher at around 10%.
- Semiannual-pay asset bucket: Usually between 5% and 10%. This limits the payment frequency mismatch between collateral assets that pay semiannually (or less frequently) and CLO liabilities that pay quarterly.
- 'CCC' rated obligor asset bucket: Usually set at 7.5% of total collateral for BSL CLO transactions, and higher for MM CLOs (often 17.50% or more). Unlike other collateral quality or concentration limitation tests, the 'CCC' asset bucket test can affect the distributions on the CLO's payment dates as the par value of 'CCC' assets above the threshold are typically haircut for purposes of calculating the overcollateralization (O/C) tests. We'll go through this

in more detail in the Coverage Tests section below. In the meantime, it's worth mentioning that, while CLO managers can and do trade down their 'CCC' asset exposure based on the impact to the CLO O/C tests, there is no forced sale of 'CCC' assets in CLO transactions.

- Deferrable asset bucket: Usually around 5%. This limits assets that could defer interest (pay in kind, or PIK) while still carrying a performing rating (thus reducing the amount of cash interest received from the assets).
- Current-pay asset bucket: Usually about 5%. Current-pay assets are loans the CLO can treat as performing assets even though the company issuing the loan has seen its rating lowered to 'CC', 'D' or 'SD' (selective default). A rating of 'SD' is typically applied to a company when it defaults on some, but not all, of the classes of debt it has issued. For more information on selective defaults, see "U.S. Corporate Defaults: Variations, Forecasts, And the Implications for CLOs," published April 29, 2021).
- Long-dated asset bucket: Usually 5% or less. Long-dated assets are loans that mature after the legal final maturity date of the CLO notes. This can introduce market value risk to the CLO since the manager may need to sell assets at the CLO's maturity in order to pay down the CLO notes in full. Aside from purchases of long-dated assets, they can sometimes end up in a CLO portfolio when an underlying loan has its maturity date extended either with or without the CLO manager's express consent.

Collateral quality tests

Similar to concentration limitation tests, collateral quality tests place guardrails around portfolio credit quality and limit what the manager can purchase. Put simply, the CLO applies these tests whenever the manager wants to perform a trade (thus changing the underlying portfolio), with a goal of measuring the impact of that trade.

Common tests include:

- Weighted average spread (WAS) test: This test serves multiple purposes. From the perspective of CLO equity holders, it is intended to ensure that the collateral will generate a minimum amount of interest proceeds, with the excess being distributed to their position. Spread also serves as a form of credit support for the CLO notes, with CLO tranches at the bottom of the CLO capital stack (and typically rated in the 'BB' or 'B' category) at risk of downgrade if the CLO's portfolio WAS drops too much. Finally, the WAS test (along with the CLO's interest coverage tests) ensures there is sufficient cash to pay interest on the rated CLO notes on payment dates. We'll explore this more later in the article.
- Weighted average life (WAL) test: Duration is an important component of any bond investment, including CLO tranches. By limiting the average life of the CLO assets, this test is intended to limit the manager's ability to extend the life of the rated notes. Along with the limit on long-dated assets described above, it also attempts to ensure that the rated notes will amortize after the CLO's reinvestment period concludes, well ahead of the legal final maturity date of the CLO notes. CLO portfolios with longer weighted average lives are also considered riskier because they have greater potential exposure to economic downturns and idiosyncratic
risk events.
- Minimum weighted average recovery rate (WARR) test: This test attempts to ensure that the collateral manager invests in assets with a certain minimum level of recovery expectations in case of defaults. For BSL CLOs, the WARR value used in our CLO analysis is calculated using

recovery ratings that our corporate analytical team assigns to each piece of debt issued by a speculative-grade company.

- Standard & Poor's CDO Monitor test: This attempts to ensure that the quality of the collateral remains above a specific threshold as the manager makes trades and asset ratings change throughout the reinvestment period. The Monitor test takes into account multiple measures of portfolio credit quality, including weighted average rating factor (WARF), WAS, and several measures of portfolio diversification (for more information, see "All You Need To Know About CDO Monitor," published March 24, 2020).

Maintain or improve: what if these limits are breached?

The tests above, and others like them in the CLO indenture, are typically subject to a "maintain or improve" standard when they fall out of compliance. That is, for any test that is failing, the collateral manager can only purchase additional assets if they improve the failing test result or at least don't make it worse. For example, if a CLO transaction is failing its WAS test because the portfolio WAS is lower than the minimum required level, any purchases will need to increase the portfolio WAS and move the test back toward compliance in order for the manager to make the trade, or at least not make the failing test result worse. Also, if a test is passing, the manager cannot generally make a trade that would cause it to fail.

How can these limits be changed?

This is covered in more detail in the section immediately below, but the short answer is: not easily. To change these limitations (thus changing the limitations on certain risks) or other items in the indenture, managers typically need consent from various classes of CLO noteholders. Specific requirements will vary from CLO to CLO, but many transactions require a majority of the holders of the controlling class (the senior-most outstanding notes) and a majority of the subordinated (residual equity) noteholders, each voting separately.

Transaction amendments

Transaction terms in a CLO indenture can typically be amended at any time by entering into a supplemental indenture, subject to certain conditions. Some amendments do not require noteholder consent if they don't materially and adversely affect any noteholder. These may include implementing name changes, clarifying language, conforming to changes in law, or (sometimes) modifying terms to conform with updated rating agency methodologies. For U.S. CLOs, these types of changes are usually covered in section 8.1 of a CLO's indenture.

Other amendments typically require some form of consent from each noteholder who would be materially affected by the proposed changes. These may include amending the stated maturity, interest rate, or principal amount of the notes; the payment priority; or certain definitions that would affect noteholder consent. For U.S. CLOs, these changes are usually covered in section 8.2 of the indenture.

The Typical CLO Lifecycle

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Timelines for newly issued CLOs vary by transaction, but most CLOs include a specified series of stages in their lifecycle (see chart 2).

Warehouse period

Some time before the CLO transaction comes into being (typically six to nine months), a CLO manager may open a warehouse line of credit with a bank and begin acquiring loans that will ultimately end up in the CLO portfolio. New issue CLOs can be collateralized by loans acquired in the new issue loan market or the secondary loan market, and having a warehouse allows the manager to opportunistically buy loans and construct a portfolio over time rather than having to scramble. The same rationale also drives the ramp-up period discussed below. Note that some managers will already have collateral loans on hand for a new issue CLO and not need a warehouse period. During times of market volatility when loan prices and CLO spreads are moving quickly, managers may issue a CLO and quickly acquire a pool of loans to lock in a favorable (and potentially fleeting) price differential. These transactions are colloquially referred to as "print and sprint" CLOs by market participants.

Pricing date

Roughly four to six weeks before the CLO transaction's closing date (see below), investors in the CLO debt tranches commit to an investment amount and specified floating spread above the benchmark (or fixed coupon in some cases) on their investments. At this point, most of the transaction's terms have been agreed upon, and the contracted credit rating agencies assign preliminary ratings to the various CLO tranches. Rating agencies may also issue a presale report or press release around this time highlighting the transaction's proposed terms, collateral portfolio, and other aspects. Often, however, because some of the terms of the CLO aren't yet finalized, these reports may be issued in connection with the CLO's closing date (see below) rather than the pricing date.

Closing date

When the CLO transaction is finalized, market participants say it is "closed," similar in process to a home mortgage or other transaction. At this point, the collateral manager uses the issuance proceeds from the CLO classes to purchase the loans from the warehouse, and the indenture--the governing document for a U.S. CLO--is executed and becomes legally binding. Further changes that could materially and adversely affect the notes would then require consent from the noteholders to become implemented and would typically be made via a supplement to the indenture.

Ramp-up period

After closing, the manager is allowed some time to make further purchases and complete the portfolio investments during this period. The rationale is similar to that for the warehouse period above. The ramp-up period ends at the earlier of when the asset pool the collateral manager is assembling becomes fully invested (i.e., reaches its "target par amount" as defined in the transaction documents), or the CLO reaches the maximum amount of time allowed for the manager to do this in the indenture (typically about six months).

Effective date

Once the portfolio has been fully purchased (or in market parlance, “ramped up”) the CLO will "go effective" subject to certain conditions, and the collateral manager shifts focus from building the portfolio to managing it. The effective date marks the end of the ramp-up period and the start of the reinvestment period described below. The coverage and collateral quality tests also become effective at this time, and the CLO starts to issue monthly trustee reports.

Reinvestment period

After the CLO transaction has reached its effective date and the manager is trading loans into and out of the portfolio according to its investment strategy and the rules set forth in the indenture, the transaction has entered its reinvestment period. Reinvestment periods can vary in length, but a typical U.S. BSL CLO has a five-year reinvestment period, while four years is more common for U.S. MM CLO transactions.

During the reinvestment period, the manager's job is to maintain the credit quality and aggregate par value of the portfolio. Interest collected from these loans is collected into an interest collection account and (on CLO payment dates) used to pay interest on the CLO notes by priority. Principal received from the collateral loans is not typically paid out to investors during the reinvestment period, but rather is redeployed into new loans (assuming the coverage tests are passing; see below). A CLO transaction's concentration limits, collateral quality tests, and coverage tests serve an important role during the reinvestment period, when the collateral manager is actively influencing portfolio composition. These limits and tests serve as guides for the manager's decision-making process and act to protect the interests of the CLO's investors by attempting to put guard rails around minimum quality and principal protection standards.

Non-call period

The non-call period often spans the first two years of the reinvestment period. As with other types of bonds that have non-call periods, during this time, the outstanding CLO tranches cannot be redeemed or called. Following this period, most CLO indentures allow a majority of the subordinated noteholders (CLO equityholders) to call some or all of the CLO's rated notes and issue replacement notes at lower spreads if the market becomes more accommodating, lowering the CLO's cost of capital and increasing projected equity returns. Replacement notes can be done via a refinancing of the CLO notes (in which little changes in the CLO indenture other than the tranche spreads) or via a CLO reset (in which more extensive changes may be made, including extending the maturity of the CLO notes and reinvestment period, and reinstating a non-call period). Alternately, after the CLO's non-call period has ended, the equityholders can opt for an optional redemption where the CLO's collateral is liquidated and the CLO's notes paid down, assuming the liquidation value of the collateral is sufficient to pay down all of the CLO notes outstanding. All of this is covered in more detail in subsequent sections below.

Amortization phase

Once the reinvestment period ends, the CLO transaction enters its amortization phase. During this phase, it becomes more difficult for the collateral manager to use principal cash generated from the loans to buy more loans, and instead, the proceeds are mostly used to pay down the tranche balances sequentially, from the most senior-rated notes to the most junior, in the priority laid out in the class hierarchy and waterfall (see the CLO Transaction Structure section below). This phase continues until either all classes have been fully repaid or the transaction's specified

legal final maturity date arrives. If any class has not been fully repaid by the legal final maturity date, this would be an event of default under the CLO indenture.

In terms of the manager's ability to manage the portfolio after the CLO's reinvestment period has concluded, most BSL CLO indentures allow the reinvestment of proceeds from unscheduled loan prepayments and sales of certain credit risk loans, though there are further limitations on the loans that can be purchased during this time.

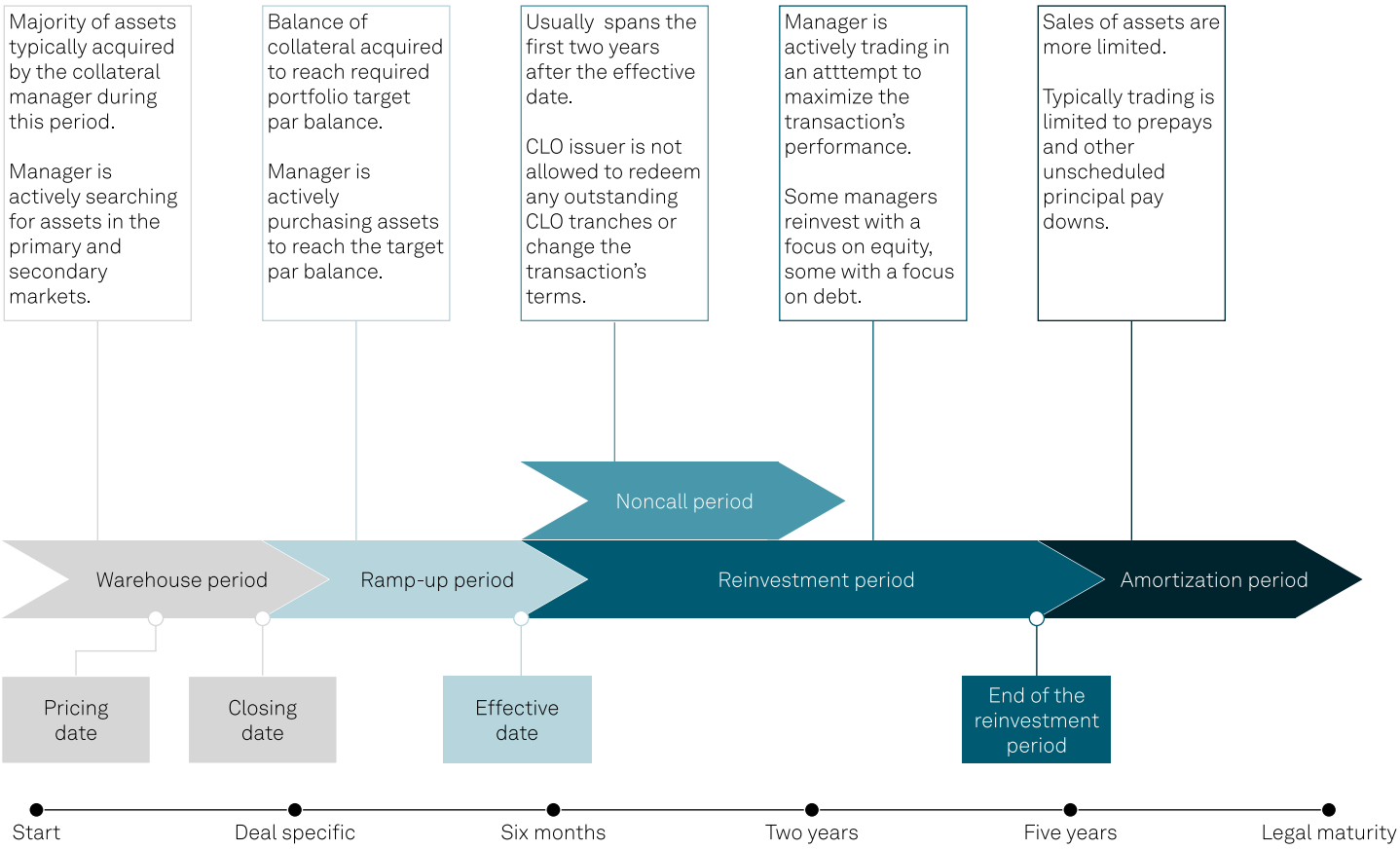
Given the sequential amortization of the CLO notes that occurs during this period, more senior notes pay down first and as such wil have shorter lifespans relative to the more junior notes. Often, after a substantial proportion of the rated debt tranches have been paid down the CLO equityholders will do an optional redemption to call the transaction and redeem the remaining notes. This is because the CLO senior notes provide the lowest cost source of funding for the transaction, and as the senior notes are amortized, the CLO's cost of capital increases until it no longer makes economic sense for the equityholders to maintain their position.

It's also worth noting that during periods with high levels of CLO resets (including 2018, 2021, and 2024), fewer CLOs reach their amortization periods because the dates for the CLO (including the reinvestment period end date) are typically extended and the CLO notes are offered to new investors (or, if they like, the existing investors in the notes can stay in their positions under the new terms and CLO tranche spreads).

A well-performing CLO transaction fully repays the balance of all classes such that their investors receive both the regular, promised interest payments in a timely manner and also their full initial investment (the principal) back.

Chart 2

The typical CLO lifecycle



Source: S&P Global Ratings.

CLO Refinancings, Resets And Redemptions

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Depending on prevailing market conditions and CLO-specific factors, CLO managers or equity investors may decide to refinance (refi), reset, or optionally redeem a CLO transaction. We'll talk about each of these below.

CLO refinancings and resets typically occur when credit conditions become more favorable and CLO spreads tighten. In such an environment, declining loan spreads can depress CLO equity returns and refinancing the CLO notes (or doing a reset of the transaction) can lower the CLO's current cost of funding set on the last pricing date, and bring the CLO tranche spreads with the now tighter loan spreads in the market. Refinancings and resets first appeared in the U.S. and European CLO markets in 2016.

CLO resets

When an existing CLO is reset, all of the notes are repaid in full, and the existing CLO investors are paid back. New CLO notes are issued under the original issuer SPE, and certain terms in the CLO indenture are amended.

By definition, a CLO reset includes amending (and nearly always reducing) credit spreads (i.e., SOFR + XXX) on the outstanding CLO tranches and extending (or "resetting") certain dates

associated with the CLO. These include the reinvestment period end date, non-call period, and legal maturity of the CLO. Other changes might include amending the indenture to reflect evolving market standards with CLO document provisions, updated rating agency criteria, or other items.

In a sense, resets turn CLOs into something akin to a perpetual vehicle, with maturities that can be repeatedly extended (after paying back the investors each time). Investing in a CLO reset is similar in many ways to investing in a new issue CLO, except that resets already have a full portfolio (i.e., there's no need to "ramp up" a new portfolio as there typically is with a new issue CLO). The collateral in a CLO reset is still held by the issuer, but now supports the new (post-reset) CLO notes. Essentially, it is a new transaction backed by an old transaction's portfolio, which has typically aged (or "seasoned") to an extent.

If you're a current noteholder, you have two options in a reset: get repaid in full and use that cash elsewhere, or invest in the newly issued CLO notes with extended dates and new (presumably tighter) CLO tranche spreads. For noteholders, the decision boils down to the options available in the market to deploy capital at the time of the reset (as well as the new characteristics of the notes).

CLO refinancings

A refinancing (refi) is comparatively more straightforward, as the only changes made involve offering new tranches with lower spreads. The capital structure and subordination levels typically remain otherwise the same, the reinvestment period and other dates are not extended, and changes to the indenture are typically minimal. Refis may entail a refinancing of the entire capital structure (a full refi) or refinancing of just selected tranches within the structure (a partial refi) – typically the 'AAA' tranche.

The emergence of CLO refis has given CLO investors something of a term curve to select from, with the ability to invest in transactions with shorter tenors in addition to the typical five-year reinvestment periods and two-year non-call periods that most new issue CLOs come to market with.

Both resets and refis generally require votes from a majority of the equityholders, with the additional consent of the collateral manager. They can only be done after the CLOs non-call period has ended.

CLO optional redemptions

Another alternative, often seen with CLOs that are further along in their lifespan, is an optional redemption of the CLO notes. In an optional redemption, the CLO trustee will first confirm that a liquidation of the portfolio collateral would be able to pay back all of the CLO's rated notes, including accrued interest and expenses. If this is the case, the equityholders can direct the trustee to sell the collateral and pay down the CLO notes in full. Optional redemptions are more common in cases where a CLO has amortized a significant portion of its notes, or where doing a CLO reset would require significant equity contribution to fund a portfolio cleanup in order to make the CLO notes attractive to new investors. The equityholders may view redemptions as a good option when the market value of the CLO collateral has increased, since the equityholders will get all of the proceeds left over once the rated noteholders have been paid back and expenses are covered.

CLO Transaction Structure

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Now let's get into those tranches we keep talking about.

Overview of debt

The CLO issues debt (securities/notes) to investors in the form of different classes of notes (often rated in the 'AAA', 'AA', 'A', 'BBB', and 'BB' categories) and unrated equity notes. Each class encompasses different levels of risk and return. The terms "class", "tranche", and "note" are all used interchangeably, and they all refer to the various bonds being issued by the SPE and held by investors.

Senior tranches are the least risky (most protected) tranches and get paid the lowest interest rate. They are typically rated 'AAA' and 'AA' and by par make up the bulk of total debt issued. Unlike the tranches lower in the CLO capital stack (rated ‘A’ and below), ‘AAA’ and ‘AA’ notes are generally not deferrable, meaning missing an interest payment would lead to an event of default for the CLO. In most CLOs, the 'AAA'-rated tranche is the controlling class, meaning that its noteholders are given greater control over changes to the CLO indenture.

Mezzanine tranches are riskier than the senior tranches, but offer higher rates of interest and still have considerable protection against collateral defaults. They are normally rated in the 'A' to 'BBB' categories. These tranches are generally able to defer interest payments, which can happen if a coverage test higher in the CLO capital structure fails and interest payments are diverted from lower-rated tranches. Any deferred interest amounts are added to the tranche balance, with interest then owed on any previously deferred interest.

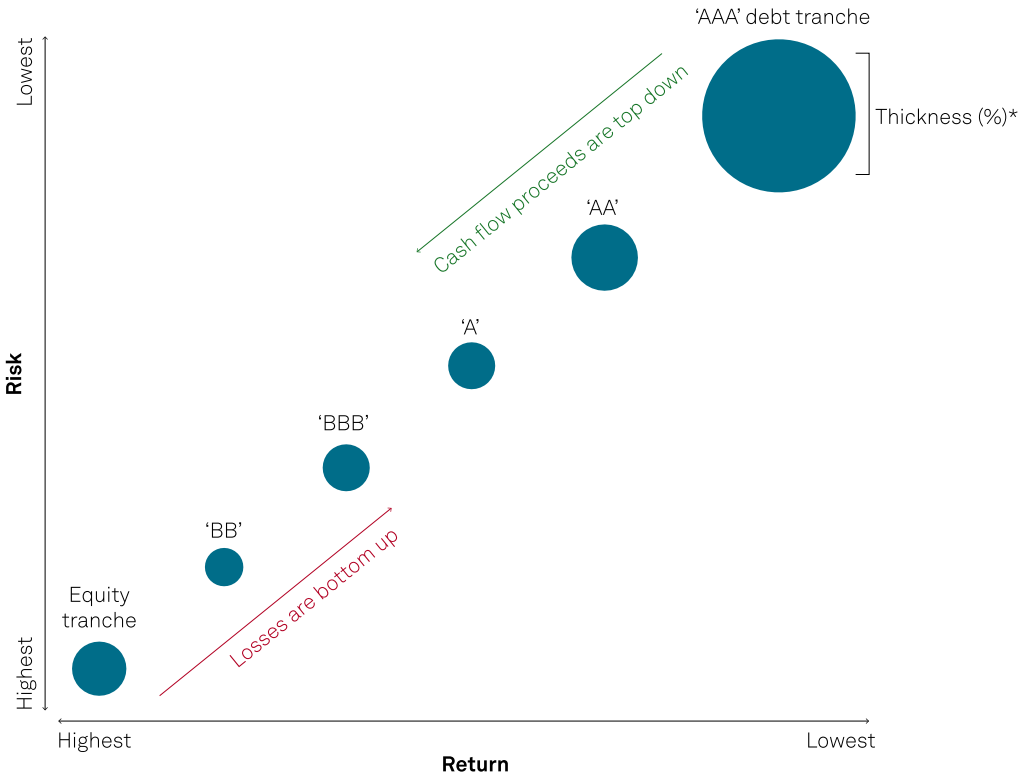
Junior tranches are the riskiest of the rated debt tranches and pay the highest promised rate of interest. They are often rated in the 'BB' category, though some CLOs also include a 'B' rated tranche depending upon market conditions when the CLO is issued. Like mezzanine tranches, junior tranches typically can defer interest payments, with interest then owed on any previously deferred interest.

Equity or subordinated notes sit at the bottom of the CLO capital stack and are the first in line to face losses if the CLO collateral pool performs poorly, and the last to be repaid. The equity is unrated and receives excess (residual) cash after the debt tranches are paid their due amounts. As such, its payments are not promised amounts like the debt classes above. Because the equity notes heavily rely on excess spread to generate a return, equityholders are typically the transaction party that has the ability to trigger a reset, refinancing or optional redemption of the CLO notes in order to maximize their returns.

The cash flows generated by the collateral portfolio are placed in interest and principal collection accounts and used to make payments to the layered CLO tranche structure according to a payment priority (waterfall) described in detail in the CLO's legal documents (indenture or offering circular). In general, cash from the collateral loans is paid out to the tranches by seniority from the top down. This, combined with exposure to losses on the collateral starting at the bottom of the capital structure and working up, creates the different risk profiles for the various classes of notes and equity (see chart 3).

Chart 3

The tranche structure of a CLO



*This example is sized based off a typical U.S. BSL CLO. Source: S&P Global Ratings.

During the reinvestment period, principal payments received from the CLO assets can usually be redeployed by the CLO manager into new assets. During the amortization phase, principal cash is (with some exceptions) used to pay down the CLO notes sequentially. If a CLO isn't reset or optionally redeemed, the lifespan of typical CLO 'AAA' notes might be seven years or so (five years from the CLO's reinvestment period, plus another two years to fully amortize). The lifespan of the classes below the 'AAA' notes typically have longer tenors given that the 'AAA' notes have to be paid down in full before the notes below them start to get principal back. In practice, however, many CLOs either reset before they get to the amortization period, or will optionally redeem and start selling the remaining portfolio at some point as the senior notes pay down.

So how do you go from a pool of 'B'-rated loans to a 'AAA'-rated CLO tranche?

Several methods are typically used to protect rated classes of CLO notes from losses, including:

- **Subordination:** Subordination generally refers to the layering of risk levels, giving some tranches higher priority claims on the cash flows than others and therefore distancing them from loss exposure. All CLO noteholders are looking to the same collateral pool to provide the interest and principal due on their notes, but the senior-most classes generally have first claim to all the cash flows, followed by the next senior class and so forth.

- **Overcollateralization:** The par value of the assets held by the CLO is greater than the balance of the rated CLO notes. This is because the proceeds from the sale of the equity notes, which are unrated, are also used to purchase assets that will back the transaction. This additional collateral serves to protect all of the rated liability notes issued by the CLO.
- **Excess spread:** Excess spread typically refers to the excess of interest income received from the assets over the amount of interest due on the CLO liability notes. If all goes well and the transaction is able to make interest payments to the noteholders on a given payment date, this excess interest flows to the equityholders. However, if a CLO experiences stress (collateral defaults, excess 'CCC' asset exposure, etc.), coverage tests may be breached that will divert interest payments away from equity (and, in some cases, also the junior liability notes) and use them to pay down the principal on the most senior class of notes outstanding. We'll explain the mechanics below, but this serves to restore credit enhancement to classes senior to the one seeing its interest redirected.

Coverage tests

Coverage tests are a defining feature of CLO transactions and act as "temporary shock absorbers" when the underlying collateral experiences stress. If the coverage tests fail, the tests will breach and force a redistribution of excess interest cash from less senior tranches to be used to pay down the balance of the most senior tranche. Equityholders forgo their interest income until a future payment date when the tests are passing again, and the diversion of interest cash restores credit enhancement to senior tranches.

CLOs usually have three types of coverage tests: the overcollateralization (O/C) test, the interest coverage (I/C) test, and the interest diversion test (IDT).

The overcollateralization (O/C) test

The O/C tests measure asset coverage of the various classes of CLO notes. It is calculated by dividing the principal balance of the collateral portfolio (with certain adjustments) by the balance of the applicable tranche and all tranches senior to it. Most CLOs have O/C tests at the 'AA' tranche level and at each rated class of notes below that. Each O/C test has a required minimum ratio, as specified in the CLO's legal documents. The O/C test for a tranche passes if the calculated ratio exceeds or equals its respective O/C trigger. The O/C triggers are typically set at specific levels so that under a stress scenario the lowest-rated class will breach its test before more senior debt does.

The numerator of the O/C ratio (which measures the par value of assets available to support the rated CLO notes) is the same for each of the CLO's O/C tests. The par value of the assets is haircut for any defaulted assets held by the CLO, as well as excess 'CCC' assets held by the CLO above a pre-defined threshold (typically 7.5% of total collateral for U.S. BSL CLOs and 17.5% or above for U.S. MM CLOs). Other asset haircuts can also be present, including for loans that mature after the stated maturity of the notes (long-dated assets) and loans that were purchased by the collateral manager at a price that could indicate stressed performance (discount obligations).

Formula 1

$$\text{Overcollateralization} = \frac{\begin{array}{l}\text{Principal balance of collateral} \\ + \text{S\&P Global Ratings' value of all defaulted collateral} \\ + \text{Purchase price of discounted collateral} \\ - \text{'CCC' excess adjustment amount}\end{array}}{\text{Principal balance of that tranche and all tranches senior to it}}$$

Let's look at a numerical example. Assume CLO ABC has an asset balance of $400 million on day one (with no defaulted assets held). The CLO has five rated tranches (classes A, B, C, D, and E) rated 'AAA', 'AA', 'A', 'BBB-', and 'BB-', respectively. After one year, CLO ABC suffers defaults on 5% of its collateral assets, which have an assumed recovery value of 40% of par. The assumed recovery value for a defaulted asset held in a CLO is typically the lower of rating agency recovery assumption for the asset and its current market value.

In addition to the defaulted assets held, the CLO also has 10% of its total assets coming from companies rated in the 'CCC' range, relative to an allowable maximum of 7.5%. The excess 'CCC' assets (2.5% of total collateral in our example) will be carried at market value rather than par, with the lowest market value 'CCC' assets held used to calculate the haircut amount for purposes of calculating the O/C test. For purposes of our example, we'll assume a market value of 70% for our excess 'CCC' assets.

Table 3

Breakdown of O/C calculation

	Day 1	Day 365
Par value of collateral (mil. $)	400	400
Defaulted assets (mil. $)	0	(20)
Assumed recovery value of defaulted assets (mil. $)	0	8.0
Par value of excess (>7.5%) 'CCC' assets held (mil. $)	0	(10)
Market value of excess 'CCC' (>7.5%) assets held (mil. $)	0	7
O/C numerator (mil. $)	400.0	385.0
Balance of classes (mil. $)		
A ('AAA (sf)')	256	256
B ('AA (sf)')	48	48
C ('A (sf)')	24	24
D ('BBB- (sf)')	24	24
E ('BB- (sf)')	16	16
Equity	32	32
O/C numerator (mil. $)	400	385.0
Senior (A + B) O/C denominator (mil. $)	304	304
Senior (A + B) O/C test value (%)	131.58	126.64
Senior (A + B) O/C test trigger (%)	123.00	123.00
Cushion (%)	8.58	3.64
C O/C denominator (mil. $)	328	328
C O/C test value (%)	121.95	117.38
C O/C test trigger (%)	115.00	115.00
Cushion (%)	6.95	2.38
D O/C denominator (mil. $)	352	352
D O/C test value (%)	113.64	109.38
D O/C test trigger (%)	109.00	109.00
Cushion (%)	4.64	0.38
E O/C denominator (mil. $)	368	368
E O/C test value (%)	108.70	104.62
E O/C test trigger (%)	105.00	105.00
Cushion (%)	3.70	(0.38)

O/C--Overcollateralization. Source: S&P Global Ratings.

After one year, the class E O/C test is breached, with a cushion of negative 0.38%. To bring the test back into compliance, the ratio needs to equal or rise back above 105.00%. Assuming the O/C numerator remains unchanged ($385 million), the notes need to be paid down sequentially using interest cash so that the denominator equals about $366.67 million ($385 million/105.00%).

What happens if you breach this test?

Failure of an O/C test results in disruptions to the flow of payments in chart 4. In the event of a failure on a determination date, the CLO indenture requires that proceeds be diverted to pay the outstanding balance of the senior-most tranche on the related payment date. This will bring the test back towards compliance. Such payments will only be made until enough of the senior tranche has been repaid (and the denominator is reduced enough) that the ratio is once again passing.

In the above example, the class E O/C test, which is calculated after the class E notes are paid interest in the waterfall, was breached. However, if the class D O/C test had failed, the class E notes would be cut off from receiving their interest payment for that payment period because that payment falls below the class D O/C trigger calculation. This portion of missed class E interest would still be due at a future date and would be added to the principal balance of the class E notes (and in the O/C denominator) until it can be paid on a future payment date, with interest also being paid on the accrued interest amount.

The interest coverage (I/C) test

Similar to an interest coverage test for a company's debt, this ratio measures interest cash the CLO has on hand (or can reasonably expect to have on hand as of the next payment date) divided by the interest that will be due to specified CLO tranches on the next payment date, minus manager fees and quarterly expenses. Historically, during times of economic stress, the O/C ratio test has been much more likely to fail and redirect cash to the senior notes than the I/C test has. Nonetheless, the I/C test serves a useful purpose: It indicates how well interest proceeds from the collateral assets can cover interest payments due on each of the CLO's debt tranches.

The I/C ratio for a tranche is found by dividing the amount of scheduled interest due to be received from the underlying assets by the interest scheduled to be paid to that tranche (and, if applicable, all tranches senior to it) on the next payment date. Like the O/C tests, the I/C tests at each tranche level have defined minimum thresholds the ratio must equal or exceed to pass.

Formula 2

$$\text{Interest coverage ratio} = \frac{\text{Interest received from collateral}}{\text{Interest due on the tranche and tranches senior to it}}$$

Because the numerator of the I/C ratio is determined based on actual or expected interest received rather than the value of such interest, there is no need to reduce the numerator for this test through asset value haircuts like we adjusted the numerator in the O/C calculation.

What happens if you breach this test?

If an I/C test fails, a similar change to the flow of payments happens as when an O/C test fails: Available proceeds are paid on the CLO notes sequentially (starting from the top, thus reducing the denominator for all I/C ratios) until the test is passing once more. By diverting proceeds (that would have otherwise gone to the equity tranche) to pay down CLO notes, the I/C test, like the O/C test, protects the senior notes against risks inherent in a deteriorating portfolio.

The interest diversion test (IDT)

The IDT, sometimes referred to as the reinvestment O/C test, is similar to the O/C test. The IDT ratio is calculated and interpreted in the same way as the O/C ratio. This test generally includes all classes of notes and is calculated after each class has received its interest coupons.

However, there are three main differences:

- The trigger: The IDT trigger is usually set around 50-100 basis points higher than the junior-most O/C test. This means that the IDT is breached before the junior-most O/C test.
- The applicable period: Unlike the O/C tests, which apply throughout a CLO transaction's lifetime, the IDT usually only applies during a CLO's reinvestment period.
- The consequence of a breach: When the IDT fails, the CLO notes are generally not paid down but rather used to purchase new collateral loans. Decreasing the notional balance of the notes (reducing the denominator) is not the only way to raise this ratio back above its trigger. When the IDT is breached, the remaining interest proceeds are diverted from equity and instead reclassified as principal proceeds and used to buy additional collateral, thus increasing the numerator of the IDT ratio. The amount that can be diverted is usually capped at the lower of 50% of the interest proceeds remaining at the time and the required amount to put the test back in compliance.

Payment waterfall

The cash flows generated from the collateral assets are used to pay interest and principal on the CLO tranche structure according to a payment priority, or "waterfall," which the transaction's legal documents establish. Most CLO transactions have two separate waterfalls: the interest waterfall for proceeds from interest payments on the collateral assets and the principal waterfall for proceeds from principal payments stemming from asset maturities, prepayments, sales, or recoveries after default.

Note that application of the principal waterfall usually follows the interest waterfall, and includes covering any potential shortfalls from the interest waterfall. Principal proceeds received from the assets are used to either purchase additional collateral during the reinvestment period or pay down the CLO notes after the CLO's reinvestment period has concluded.

The interest waterfall uses interest received from the collateral to pay interest on the CLO notes sequentially. The excess interest proceeds (if any) after paying interest on all the rated debt notes are distributed to the equity tranche. However, when a coverage test is breached, interest proceeds can be diverted to pay down the principal on the senior debt notes rather than flow through the normal order of the waterfall.

The principal waterfall uses principal and recoveries received from the collateral to either invest in new collateral (during the reinvestment period) or pay down the notes (during the amortization period). In the event that interest proceeds from the assets fail to cover interest due on the notes or cure any failing coverage tests, principal proceeds are sometimes used to cover the shortfall.

At the top of the waterfalls, ahead of interest due on even the 'AAA' rated CLO notes, are administrative expenses, senior collateral manager fees, and other items typically paid first to "keep the lights on" for the CLO transaction.

After the reinvestment period has concluded and principal received from the assets is being used to pay down the CLO's notes, the sequential nature of the waterfall increases credit support available to the senior classes of notes in the form of subordination as the senior note balances

are paid down (i.e., amortize). This can help protect senior CLO notes as the portfolio becomes smaller and less diverse as some assets mature.

A simplified example of an interest waterfall and principal waterfall from a 2024 new issue U.S. BSL CLO in tables 4 and 5, respectively.

Table 4

Examples of a CLO interest waterfall payment priority

Example 1	
Priority	**Payment**
1	Taxes and fees; and then administrative expenses (capped).
2	Senior management fee and other expenses (capped)
3	Hedge payments, if applicable, pro rata, except for amounts due to termination (or partial termination), and then hedge payments pursuant to an early termination (or partial termination).
4	Class A-1 note interest; and then class A-2 note interest.
5	Class B note interest.
6	Class A/B coverage tests.
7	Class C note interest.
8	Class C coverage tests.
9	Class C note deferred interest.
10	Class D note interest.
11	Class D coverage tests.
12	Class D note deferred interest.
13	Class E note interest.
14	Class E coverage tests.
15	Class E note deferred interest.
16	Effective date ratings confirmation. If confirmation is not obtained, pay according to the debt payment sequence or purchase collateral obligations to the extent necessary to obtain a rating agency confirmation.
17	Reinvestment overcollateralization test (during the reinvestment period only). If it fails, use the lesser of 50.0% of the remaining interest proceeds and the amount needed to satisfy the test.
18	Subordinated management fee.
19	Accrued and unpaid administrative expenses; then hedge payments (if applicable); and then refinancing and/or re-pricing expenses.
20	Deposit to the financing expense account, at the manager's direction.
21	To the subordinated noteholders until incentive management threshold realized.
22	Remaining proceeds to the incentive management fee and to the subordinated noteholders.

Example 2	
Priority	**Payment**
1	Items 1-5 of the interest waterfall.
2	Item 6 of the interest waterfall.
3	Item 8 of the interest waterfall.
4	Item 11 of the interest waterfall.
5	Item 14 of the interest waterfall.
6	Item 7 of the interest waterfall.
7	Item 9 of the interest waterfall.
8	Item 10 of the interest waterfall.
9	Item 12 of the interest waterfall.

10	Item 13 of the interest waterfall.
11	Item 15 of the interest waterfall.
12	Effective date ratings confirmation. If it is not obtained, purchase collateral obligations or pay according to the debt payment sequence (each to the extent necessary to obtain a rating agency confirmation).
13	On any redemption date (other than for a partial redemption or re-pricing), pay according to the debt payment sequence; on any other date make payments in the special redemption amount according to the debt payment sequence.
14	During the reinvestment period, purchase additional collateral obligations.
15	After the reinvestment period, pay according to debt payment sequence.
16	After the reinvestment period, item 18 of the interest waterfall.
17	After the reinvestment period, administrative expenses (uncapped).
18	After the reinvestment period, hedge payments (if applicable).
19	To the subordinated noteholders until the incentive management threshold is realized.
20	Remaining proceeds to the incentive management fee and to the subordinated noteholders.

Source: S&P Global Ratings.

S&P Global Ratings' Analytical Approach

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In this next section, we'll provide a high-level overview of our analytical approach to rating CLO transactions. Our methodology is covered in detail in our CLO criteria (see "Global Methodology And Assumptions For CLOs And Corporate CDOs," published June 21, 2019), which includes a section outlining the assumptions used in CDO Evaluator and the approach used to develop the criteria and the model.

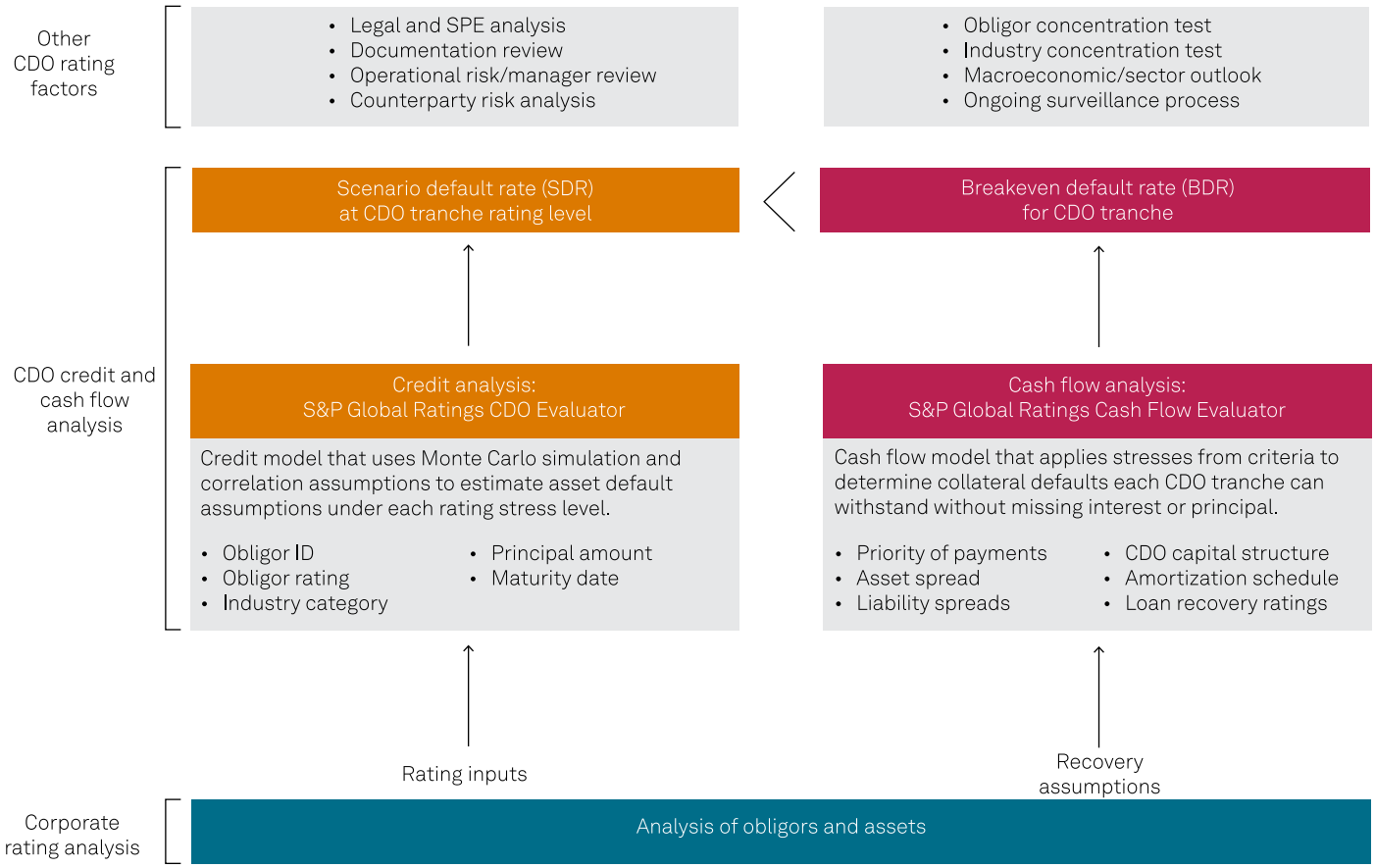
As with other types of structured finance securitizations, our analytic framework for CLO ratings includes five key areas, or pillars (see "Principles Of Credit Ratings," published Feb. 16, 2011):

- Credit quality of the securitized assets
- Legal and regulatory risks
- Payment structure and cash flow mechanics
- Operational and administrative risks
- Counterparty risk

In this primer, we'll focus on the two areas that are central to our quantitative analysis of CLOs, and which are covered in detail within the CLO criteria: credit quality of the securitized assets, for which we use our credit model (CDO Evaluator), and payment structure and cash flow analytics, for which we use our cash flow model (S&P Cash Flow Evaluator). The other three areas of analysis are covered predominantly by criteria used across structured finance transactions.

Chart 4

S&P Global Ratings' CDO Analysis



Source: S&P Global Ratings

CDO Evaluator: assessing a portfolio's credit quality

To assess the credit quality of a given CLO portfolio we use our credit model, CDO Evaluator. This model analyzes the credit quality of a portfolio of rated assets and generates a scenario default rate (SDR) at each potential CLO tranche rating level, from 'AAA (sf)' down through 'CCC-(sf)'. Each SDR produced by CDO Evaluator represents the level of collateral defaults we expect from the portfolio under levels of economic stress commensurate with our various rating levels, expressed as a percentage.

We use this set of SDRs to determine, for each credit rating level, the gross level of asset defaults that we generally expect a CDO tranche with that rating to be able to withstand, according to our rating criteria.

For example, if CDO Evaluator produced a 'AAA (sf)' SDR of 60% for a CLO portfolio, this would indicate our expectation that 60% of the collateral in that portfolio will default under a level of economic stress we deem commensurate with our 'AAA' rating level (see appendix A in "S&P Global Ratings Definitions," published Dec. 2, 2024). Therefore, in order for a CLO tranche backed by that portfolio to be rated 'AAA (sf)', cash flow modeling under our criteria stresses would generally need to show the tranche be able to withstand at least 60% of the CLO collateral defaulting cumulatively without the CLO tranche itself defaulting.

Scenario default rates produced by the model for CLO tranche ratings below 'AAA (sf)' would be commensurate with less punitive levels of stress associated with those rating levels, and hence be lower. Table X below shows the full array of SDRs for a sample U.S. BSL CLO pricing in first-quarter 2025.

Table 5

Scenario defaults rates for a sample BSL CLO

CLO tranche rating	Scenario default rate (%)
'AAA (sf)'	55.98
'AA+ (sf)'	50.55
'AA '(sf)'	48.42
'AA- (sf)'	45.76
'A+ (sf)'	44.11
'A (sf)'	42.84
'A- (sf)'	40.51
'BBB+ (sf)'	38.87
'BBB (sf)'	37.54
'BBB- (sf)'	34.06
'BB+ (sf)'	31.69
'BB (sf)'	29.84
'BB- (sf)'	27.57
'B+ (sf)'	25.63
'B (sf)'	23.90
'B- (sf)'	22.30
'CCC+ (sf)'	20.75
'CCC (sf)'	19.21
'CCC- (sf)'	18.04

BSL--Broadly syndicated loan. CLO--Collateralized loan obligation. SDR--Scenario default rate.
Source: S&P Global Ratings.

Generally, CDO Evaluator will produce lower SDRs for higher-quality CLO portfolios (because the model expects fewer defaults from these portfolios under the assumptions in our criteria) and vice versa. A number of portfolio factors drive the SDRs, but some of the key ones include:

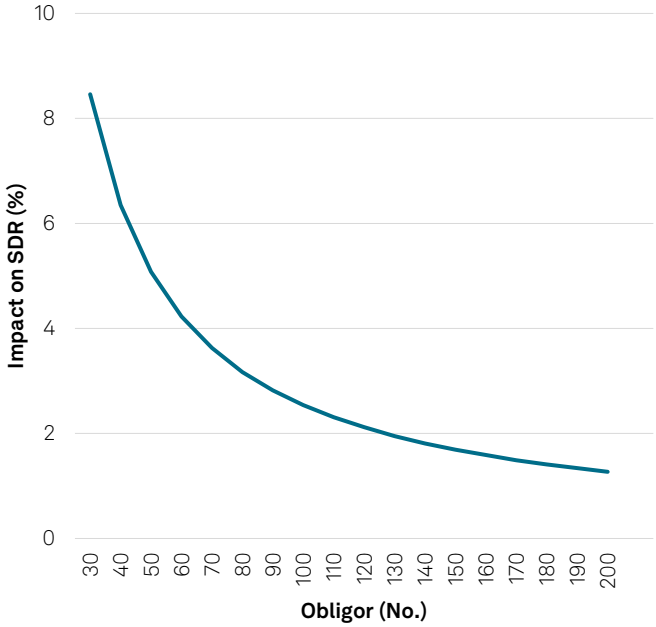
- Credit quality of the assets. The most important factor is the credit quality of the assets in the CLO portfolio, as indicated by the issuer credit ratings (ICRs) of the companies issuing them. The SDRs for a portfolio backed by 'BB+' rated assets on average would be significantly lower than the SDR for a portfolio backed by assets with an average rating of 'B-' because the 'BB+' portfolio has a lower probability of expected defaults. In addition to generating the SDRs, CDO Evaluator also calculates the S&P Global Ratings' weighted average rating factor (SPWARF) for the portfolio, a useful metric of portfolio credit quality.
- Diversity of the portfolio in terms of obligors, industries, and countries. A portfolio that has significant exposure to a handful of industries is viewed as riskier than a portfolio diversified across many industries, and tranches from that CLO would require more subordination to attain a given rating level, all else being equal. The model displays three metrics showing the industry diversity measure (IDM), obligor diversity measure (ODM), and regional diversity measure (RDM) for the assets in the CLO portfolio.

- The weighted average life (WAL). A longer WAL is considered riskier from a credit perspective because the probability of defaults typically increases as a function of time, given that the portfolio is exposed to greater potential for macroeconomic distress and default events.

Note that diversity is key, but the benefit from it is limited, meaning that continually adding obligors or industries to the portfolio won't endlessly result in lower SDRs. Adding 10 obligors to a portfolio of 15 obligors will have a larger impact on the SDRs than adding 10 obligors to a portfolio of 150 obligors. The same logic applies to industries (see charts 5 and 6).

Chart 5

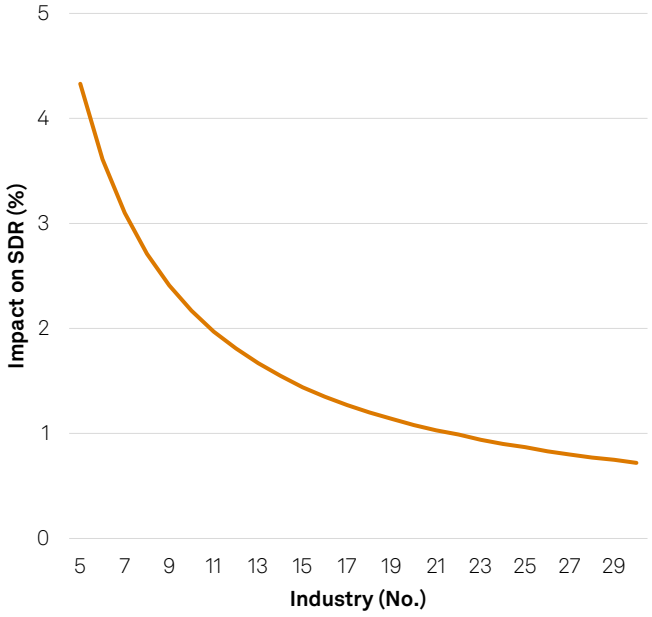
Impact of obligor diversity on the SDRs



SDR—Scenario default rate. Source: S&P Global Ratings.

Chart 6

Impact of industry diversity on the SDRs



SDR—Scenario default rate. Source: S&P Global Ratings.

Cash Flow Evaluator: Assessing the CLO structure

CDO Evaluator gives us half of what we need for our CLO quantitative analysis, by providing (through the lens of our CLO criteria) the level of gross defaults a CLO tranche backed by a portfolio should be able to withstand in order to be assigned a given rating. Now we need to determine what level of defaults each tranche in the CLO structure can withstand under the stresses outlined in our criteria. In other words, how much credit protection does the CLO structure provide the various classes of noteholders?

To analyze the cash flow and structure of a CLO transaction, we use our proprietary cash flow model (S&P Cash Flow Evaluator) and the assumptions outlined in our CLO criteria. The model projects the cash flows generated from the pool of securitized assets under various stress assumptions at different rating levels, and then evaluates whether the CLO can fully pay down each class of CLO notes under the level of gross defaults commensurate with the proposed CLO tranche rating (that is, the SDR from CDO Evaluator for the CLO portfolio at the relevant rating level).

To determine whether the projected cash flows generated by the assets are sufficient to meet the obligations of the issuer in a timely manner, the model is set up with the full CLO capital structure (including tranche balances and interest obligations) and the CLO waterfall. The model

is also set up with information about the CLO collateral, including an amortization profile of the assets, along with their weighted average spread (WAS) and weighted average recovery rate (WARR). Cash Flow Evaluator provides for each tranche a break-even default rate (BDR), which is the maximum default rate that can be applied to the collateral while still ensuring the tranche receives timely interest payments and ultimate principal repayments under the stresses in our CLO criteria.

We stress the transaction's cash flows to analyze how each tranche is paid under different stress assumptions. Some of these assumptions include fluctuations in interest rates and the timing of collateral asset defaults. Interest rate stresses assess how a transaction will pay out under varying interest rate environments. We typically apply multiple interest rate scenarios (rising, falling, rising then falling, etc.) to each asset default pattern Cash Flow Evaluator runs. These scenarios simulate interest rate curves based on the rating-based stress scenarios to project future interest rate movements.

For the timing of default assumptions, we apply defaults to the collateral assets throughout a transaction's life and analyze how each tranche handles the availability of collateral and recovered cash. We simulate multiple default patterns because the timing of asset defaults affects the cash flow available for each tranche.

For instance, applying a front-loaded default pattern (defaults occurring early in a transaction's life) would usually trigger the breach of coverage tests sooner, which would lead to faster repayment of the senior notes and potentially less excess spread for the junior-most tranche. On the opposite side, a back-loaded default pattern (defaults occurring later in the CLO's life) would lead to higher excess spread distributed to the junior and equity noteholders early in the transaction's life, which depletes credit support and could leave the transaction vulnerable to later defaults.

What drives the BDR (maximum default rate a tranche can withstand)? Similar to the factors shaping SDRs, several factors play considerable roles in determining the BDR for a given tranche, including subordination, average expected recovery amounts, and available excess interest. Additional features such as the coverage test triggers, the portfolio's amortization curve, and the waterfall structure can also affect the BDRs:

- **Subordination:** The higher the credit enhancement for a given CLO tranche, the higher the BDR will be, all else being equal. In other words, a tranche with more loss protection in the structure will withstand more losses from defaults in the underlying portfolio.
- **Weighted average recovery rate:** Cash Flow Evaluator derives recovery assumptions for future asset defaults based on the recovery rating of each asset in the portfolio (see table 12 in our CLO criteria "Global Methodology And Assumptions For CLOs And Corporate CDOs," published June 21, 2019; for assets without a recovery rating, table 15 is used). All else being equal, a CLO transaction with higher recovery ratings in its portfolio can endure more defaults because the assets aren't projected to lose as much value upon default as a transaction with lower average recovery expectations.
- **Excess spread:** The more excess spread a transaction generates, the more cash is available to benefit the rated notes in the event one or more coverage tests are failing and interest proceeds are being diverted. Therefore, excess spread serves as a form of credit support for the rated CLO notes.

To summarize, Cash Flow Evaluator quantifies the amount of portfolio defaults a tranche can withstand while still meeting its payment obligations, as represented by the BDR. To measure this, we apply multiple stresses such as interest rate and default timing stresses. The main drivers of BDRs are credit enhancement, average recovery rate, and excess spread.

Combining the cash flow and credit analysis, we evaluate the portfolio and how it generates principal and interest proceeds. For a CLO tranche to achieve a particular rating, it should generally be able to withstand the level of defaults projected by CDO Evaluator at the proposed rating level and still pay timely interest and principal on the rated notes. If the BDR exceeds the SDR, then the cash flows show that the tranche can withstand the amount of defaults predicted by CDO Evaluator. In addition to indicating a pass/fail result at the tested rating level of stress, the analysis also provides a quantitative cushion by which a tranche may be passing or failing. This can be a useful gauge of the amount of stress a tranche could experience before being at risk of a downgrade.

Table 6

Scenario default rates and break-even default rates for a sample CLO

CLO tranche	Rating	BDR (%)	SDR (%)	BDR cushion (%)
A	AAA (sf)	62.68	57.9	4.78
B-1	AA+ (sf)	59.83	52.74	7.09
B-2	AA (sf)	53.57	50.61	2.96
C (deferrable)	A (sf)	50.57	44.9	5.67
D-1 (deferrable)	BBB+ (sf)	43.71	40.9	2.81
D-2 (deferrable)	BBB- (sf)	40.44	35.96	4.48
D-3 (deferrable)	BBB- (sf)	38.21	35.96	2.24
E (deferrable)	BB- (sf)	32.35	29.26	3.09

BSL--Broadly syndicated loan. CLO--Collateralized loan obligation. SDR--Scenario default rate. Source: S&P Global Ratings.

After a CLO closes and we have assigned ratings to the tranches, we continue to monitor the transaction to facilitate appropriate and timely actions on the ratings we have assigned. These can happen because of changes in collateral credit quality (for example if assets in the CLO collateral pool are downgraded), par loss due to defaults or sale of assets at a discount, structural elements such as coverage test breaches, among others.

Prior to a new issue CLO closing, our analysis of the portfolio involves a combination of purchased collateral, collateral committed to be purchased, and the collateral manager's indicative portfolio of the remaining assets to be purchased. It may also reflect our assumptions about the CLO's investment guidelines as outlined in the transaction documents. Once the CLO fully acquires its assets (i.e., "ramps up"), our analysis shifts to the actual assets in the now complete portfolio.

For surveillance of outstanding ratings, we monitor changes in the performance of each CLO we rate by reviewing information from various sources. These include changes in asset ratings observed from our internal systems, the CLO monthly trustee reports, and data from market feeds. On a periodic basis, we apply screening to identify transactions experiencing changes in collateral credit quality or structural performance elements. Transactions experiencing changes in performance and credit quality that could indicate a potential upgrade or downgrade are subjected to a detailed review, followed by deliberation through a rating committee if warranted.

Rating actions on the CLO tranches could be driven by performance factors including:

- Upgrades or downgrades of the borrowers of the underlying loans;
- Exposure to defaulted or nonperforming loans;
- Changes to the expected recovery rates on the underlying loans;

- A more seasoned portfolio due to the passage of a significant amount of time; and
- A less diversified portfolio because of deleveraging and amortization.

As discussed in the opening paragraphs of this section, a large portion of our overall CLO analysis focuses on the credit quality and cash flow analysis pillars of our SF rating process. CLO document review, legal review of the SPE, and analysis of counterparties and transaction participants are important parts of our CLO analysis, but cash flow and credit analysis shed the most light on the general structure and mechanics of a CLO transaction.

We discuss in more depth our considerations for operational risk, counterparty risk, and legal risk in other publications. Nevertheless, they are also key considerations in our complete initial and ongoing rating analysis of CLO transactions.

Supplemental tests

Our analysis of the overall credit quality of a CLO transaction also includes tests outside of the CDO Evaluator and Cash Flow Evaluator models. These "supplemental tests", or "outside-the-model tests", are intended to address both event risk and model risk that may be present in rated transactions. They include the largest obligor default test and the largest industry default test.

Largest obligor default test

The largest obligor test assesses whether a CLO tranche has sufficient credit enhancement to withstand the default of the largest obligors in the portfolio. The number of obligors defaulting in this test is determined by a simple matrix based on the tranche rating (see table 4 in the CLO criteria). For example, for a CLO tranche to be rated 'AAA', the tranche should withstand the default of the 10 largest obligors (rated 'B+' or below) with minimal recoveries (5%). In addition to our cash flow and credit analysis, the largest obligor test could constrain the ratings on the tranches. This test helps address the question of what would happen if some of the largest loans in the transaction defaulted.

Largest industry default test

The largest industry default test assesses whether a 'AAA' or 'AA' rated CLO tranche has sufficient credit enhancement to withstand the default of all of the obligors in the largest industry within the portfolio, with a 17% assumed recovery rate.

Although defaults of all companies in a given industry would be unlikely, actual CLO transactions do not have exposures to all companies from any given industry, but rather just to a concentrated subset of companies from each industry. Thus, it is possible that all companies in a given CLO portfolio that are members of the same distressed industry may face higher stress. This helps address the question of what would happen if the largest industry represented in the transaction's portfolio experienced a significant downturn.

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Related Criteria

- S&P Global Ratings Definitions, Dec. 2, 2024
- Global Methodology And Assumptions For CLOs And Corporate CDOs, June 21, 2019
- Principles Of Credit Ratings, Feb. 16, 2011

Related Research

S&P Global Ratings Research

- U.S. Leveraged Finance And BSL CLO Quarterly: Shifting Credit Sentiments (Q2 2025), May 9, 2025
- Private Credit And Middle-Market CLO Quarterly: Unknown Unknowns (Q2 2025), April 25, 2025
- U.S. CLO Defaults As Of March 31, 2025, April 21, 2025
- Good Things Come In Small Packages: A Short Primer On Middle Market CLOs, March 27, 2025
- U.S. BSL CLO Top Obligors and Industries Report: Fourth-Quarter 2024, Jan. 13, 2025
- 2023 Annual Global Leveraged Loan CLO Default And Rating Transition Study, June 27, 2024
- U.S. And European BSL CLOs: A Comparative Overview (2024 Update), May 23, 2024
- U.S. Corporate Defaults: Variations, Forecasts, And the Implications for CLOs, April 29, 2021
- All You Need To Know About CDO Monitor, March 24, 2020

Other research

- BofA Global Securities CLO Factbook, May 30, 2025