

Introduction to Collateralized Loan Obligations

October 2023

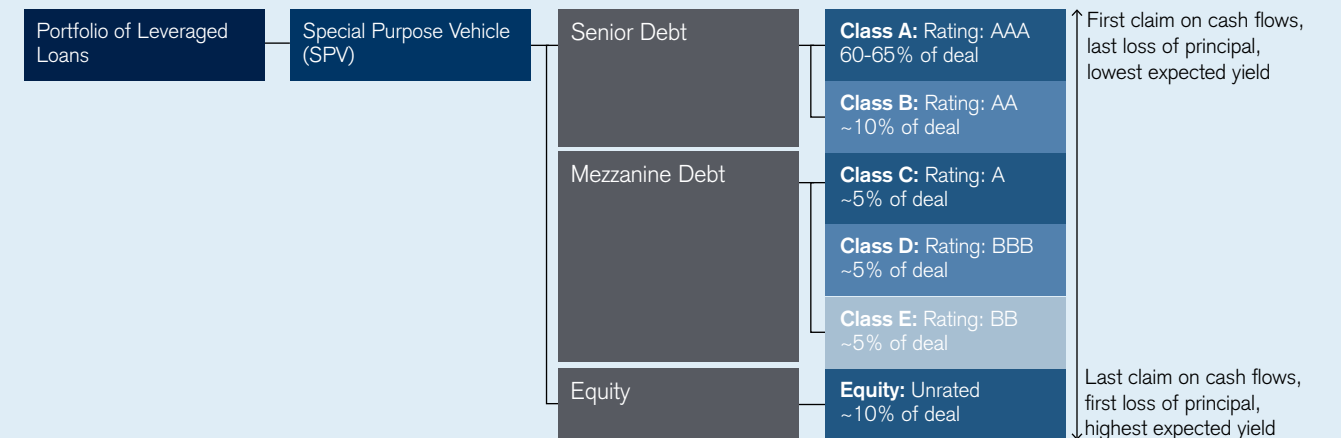


Introduction

Collateralized Loan Obligations (CLO) have grown in popularity since their emergence in the late 1990s, with nearly \$900 billion outstanding as of 2021.¹ Like other securitizations, a special purpose vehicle (SPV) issues a combination of debt and equity to fund the purchase of a portfolio of assets, almost entirely leveraged loans in the case of a CLO. Through the debt and equity issued by the SPV, investors are able to buy into a CLO at their preferred risk level, which we believe makes CLOs a potentially suitable opportunity for many different types of investors. A typical CLO is divided into five debt slices and one equity slice,

called tranches. The tranches are organized by seniority, with the most senior debt tranche having the senior-most priority among all of the tranches on cash flows produced by the CLO portfolio, giving it a superior margin of safety against default relative to other tranches, but at the lowest associated yield. Conversely, the equity tranche, sometimes referred to as the first loss tranche, has the lowest priority and is only entitled to residual cash flow after all debt tranches are paid what they are due. As such, an equity investor has the highest potential for return but at the highest associated risk.

Exhibit 1: Typical CLO Structure²



Source Credit Suisse.
For illustrative purposes only.

¹ Source: Bank of America Global Research. Data as of December 31, 2021.

² Structure shown is representative of a "CLO 2.0" issued post-financial crisis. Please see history section for a discussion of the distinctions between CLO 1.0 and CLO 2.0.

About the Credit Investments Group

The Credit Investments Group (CIG) was founded in 1997. In the following paper, CIG shares an introduction to collateralized loan obligations.

Advantages of CLOs

Over the years, we have seen CLOs grow into a mature asset class with a strong performance track record through multiple cycles. Aside from performance, CLOs have attracted many different types of investors for a number of the reasons outlined below.

Active Management

While most structured products are passively managed, the vast majority of CLOs are actively managed investment vehicles, offering the potential to outperform in changing market conditions. Managers are given wide discretion over the management of the portfolio, but are subject to a number of restrictions like collateral quality and diversification tests (discussed in the Collateral Quality Tests section of the Appendix). With a skilled manager, the ability to modify portfolio composition in response to changing market conditions or borrower quality can help preserve the cash flow and principal value of the underlying portfolio.

Diversification

Like many commingled products, investors are given proportional exposure to the entire portfolio of leveraged loans that underlies the CLO. A typical, fully ramped CLO might have anywhere from 150 to 500 borrowers in its portfolio and is subject to diversity tests which ensure appropriate allocation across companies, sectors, and geographies, among other factors. Thereby reducing concentration risks to the portfolio.

Non Mark-to-Market

The portfolio underlying a CLO is largely not marked to market, so managers are generally not obligated to liquidate positions in response to market price fluctuations. Assets are typically carried at their par value, though in some cases, a CLO is obligated to carry the assets at a discount to par or market value. For example, when an asset is trading at a deep discount in the secondary market. Given the non mark-to-market nature of most CLOs, periods of loan market volatility can represent buying opportunities, especially for adept managers, to capture more value for CLO investors.

Floating Rate and Match Funding

Also unlike some other structured products, CLOs benefit from match funding, meaning that their assets (primarily leveraged loans) and liabilities (debt tranches) are both floating rate instruments. The floating rate is quoted as a spread over a base rate (historically LIBOR, but now primarily SOFR), making the loans and CLO tranches relatively insensitive to interest rate changes with low interest rate duration. Historically, other structured products – like CBOs – owned fixed rate assets and had floating rate liabilities. That structure exposed the portfolio to increased interest rate risk and threatened inconsistent arbitrage as the interest rates on liabilities and assets did not necessarily move together. With paired floating rate assets and liabilities, CLO cash flows and payments tend to move together, making them less sensitive to interest rate changes.

History

CLOs first emerged in the 1990s, approximately ten years after the first modern securitized products came to market, and grew every year until 2008. During the financial crisis, however, investor interest in structured products generally declined precipitously, leading to the first ever year-over-year decrease in CLOs outstanding in 2009. Leveraged loan default rates peaked above 10% in 2009, causing widespread concern about erosion of par value and cash flow in the underlying portfolios of CLOs. In the end, despite high default rates within CLO portfolios, the large majority of CLOs not only survived the crisis, but performed well. Survival and performance during that period was largely due to the non mark-to-market structure of CLOs. Managers were not required to liquidate in the face of market price deterioration, and many were able to reinvest into loans at severely depressed prices thanks to the active management of the portfolio.

Despite their strong performance during the financial crisis, new issue CLOs underwent a number of changes, many of them intended to reduce risk to the debt tranches. CLOs

issued since the financial crisis are often referred to as CLO 2.0 and those issued before the financial crisis received the corresponding title of CLO 1.0. Broadly speaking, CLO 2.0s benefit from greater subordination, lower leverage, and stricter rating and collateral tests. For example, CLO 1.0 AAA tranches typically accounted for about 75% of the deal, while CLO 2.0 AAA tranches range from 60-65%. The result for the AAA investors is a higher overcollateralization ratio, or more assets junior to them in the capital structure. At the other end of the capital structure, equity tranches are generally larger in CLO 2.0s than they were in CLO 1.0s. The result is lower overall leverage in the CLO, reducing the debt burden on the portfolio and increasing overcollateralization to the debt. Partially in response to the historic volatility in the financial crisis, rating agencies reevaluated their criteria for rating structured credit, which led to stricter rating and collateral tests. Since the financial crisis, leveraged loans have not faced the same level of default activity encountered in 2009, but CLOs are structurally better equipped to handle such a period should one occur.



Collateral: Leveraged Loans

The assets comprising the vast majority of CLO portfolios – leveraged loans – are senior secured debt that is typically rated BB+ or lower. Leveraged loans are generally higher risk than investment grade debt, and offer a corresponding higher yield to compensate.

Leveraged loans benefit from their floating rate structure, short non-call periods, liquidity, and historically high recovery rates in the event of default. As mentioned previously, the spread over some floating base rate results in a low interest rate duration and generally makes loans less sensitive to interest rate changes than fixed rate products. The short non-call of loans (about 6 months) has contributed to their popularity among financial sponsors in Leveraged Buyouts (LBOs) or Mergers and Acquisitions (M&A) who value the ability to refinance debt given their typical time horizon of 3 to 5 years. In contrast, a typical high yield bond (widely considered the closest peer to the leveraged loan) has a non-call period of four or five years.

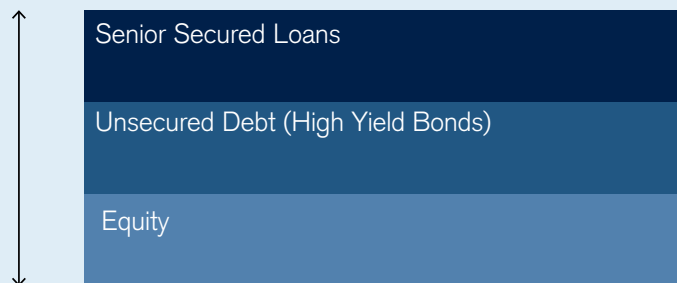
For a leveraged loan investor, the liquidity of the secondary market makes the asset class a potentially suitable option while also offering investors exposure to the private markets. In the event of default, leveraged loans have historically fared better than high yield bonds, reducing investor losses. The higher recovery rates are attributable, in part, to the senior secured status of leveraged loans in the capital structure of borrowers.

The advantages of leveraged loans have contributed to the rapid growth of the asset class, which now tops \$1.3 trillion³ outstanding with many types of investors. Loans are usually broadly syndicated, meaning an individual issuance is owned by numerous investors, enhancing liquidity and increasing the size of deal the market can accommodate. While CLOs are the largest category of buyers of loans, banks, mutual funds, and various other institutional investors (e.g. pension funds, insurance companies) are also large buyers of leveraged loans.

Exhibit 2: Corporate Capital Structure

First claim on cash flows, last loss of principal, lowest expected yield

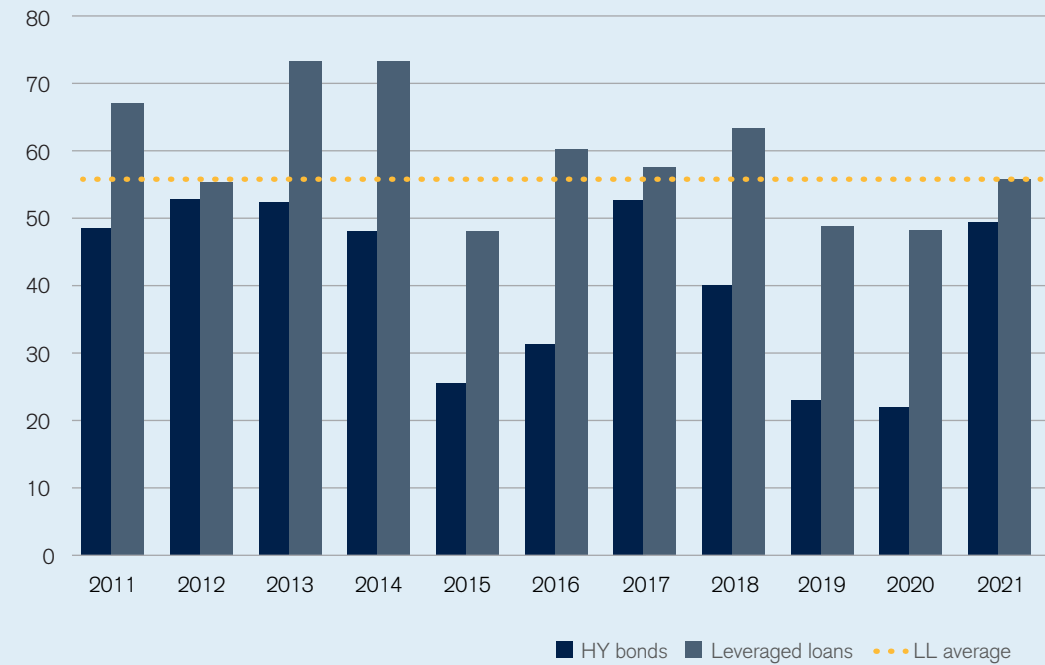
Last claim on cash flows, first loss of principal, highest expected yield



Source Credit Suisse.
For illustrative purposes only.

³ Source: S&P LCD. Data as of March 31, 2022.

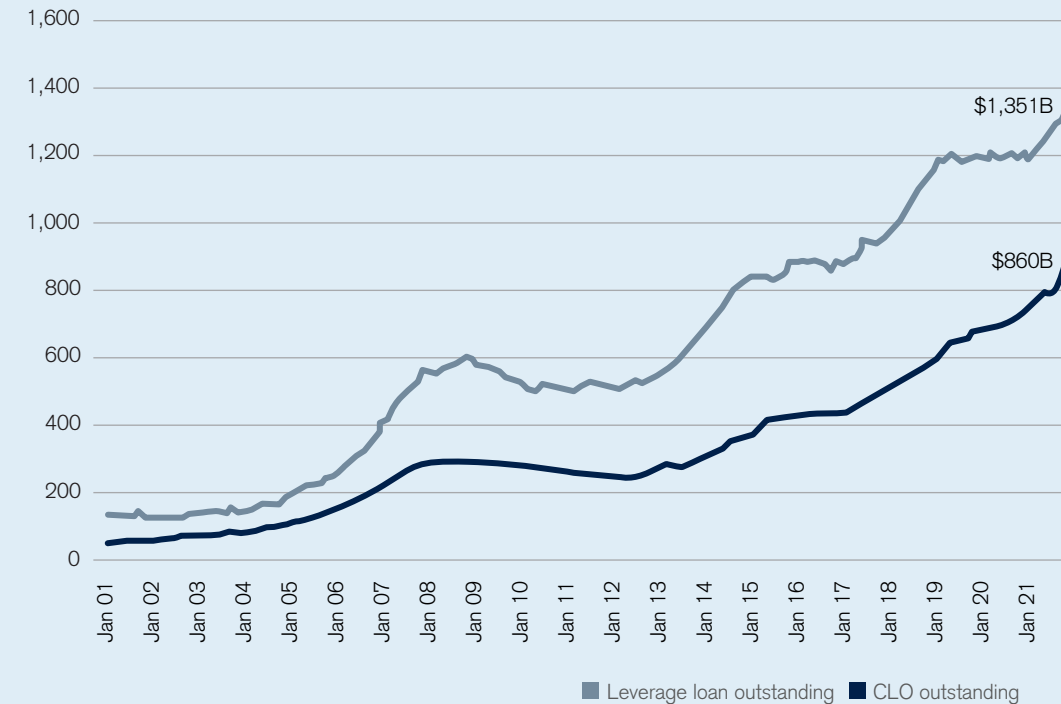
Exhibit 3: Historical Recovery Rates



Source J.P. Morgan
Historical performance indications and financial market scenarios are not reliable indicators of current or future performance.

Exhibit 4: Loan and CLO Market Growth

USD \$ billions



Source S&P LCD and BofA Securities. Data as of December 31, 2021.
Historical performance indications and financial market scenarios are not reliable indicators of current or future performance.

Conclusion

Exhibit 5: Benefits and Risks of CLOs

Benefits we see include:

Varied Risk and Return: The tranching structure of CLOs allows investors to buy in their preferred risk and return level.

Active Management: Most CLO portfolios are actively managed, which offers the potential for outperformance under a skilled manager.

Diversification: CLO investors are given a proportional exposure to the entire underlying portfolio, which might consist of 150-500 borrowers in a fully ramped CLO.

Floating Rate and Match Funding: CLOs benefit from match funding, meaning that both their assets and liabilities are predominantly floating rate instruments. The floating rates may make investors relatively less sensitive to interest rate fluctuations with low interest rate duration.

Risks we see include, but are not limited to:

Structure Risk: The structure and guidelines of CLOs can vary deal to deal, so factors such as leverage, portfolio testing, callability, and subordination, among other things, can all influence the risks associated with a particular deal.

Third Party Risk: Third party risk is introduced by the various third parties involved in the typical CLO. Counterparties include the manager, trustees, custodians, lawyers, accountants and rating agencies.

Collateral Risk: The CLO portfolio, which almost entirely consists of leveraged loans, is subject to the risks inherent to sub-investment grade debt. Those risks include but are not limited to default, diversity, and recovery risks.

Macroeconomic and Political Risk: Pricing and liquidity of the underlying portfolio can be impacted by macroeconomic and political events without warning.

Liquidity Risk: CLO tranches can be thinly traded, meaning that there may be limited liquidity in the secondary market.

Prepayment Risk: CLOs have average lives that are typically shorter than the stated maturity and tranches can be called early after the non-call period has lapsed. A majority of subordinated note holders normally determine such actions.

It is our view that CLOs are a potentially suitable investment opportunity for investors of varying risk appetites from senior, AAA-rated debt to more speculative equity positions. Risk-averse investors have turned to the senior tranches of CLOs for the yield pickup they offer over like-rated investments. Investors with greater risk tolerance, like hedge funds, pension funds, or sovereign wealth funds, have found opportunity in mezzanine debt and equity tranches. For any investor in CLOs, however, considerations of manager and structure are critically important for identifying the most suitable opportunities. While CLOs generally fared well during the financial crisis, certain managers were undoubtedly better prepared, which accrued to the benefit of investors at all levels through secondary market values and ultimate returns.

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Appendix

CLO Lifecycle

The stated maturity date of a CLO is usually very long after closing, about 12-13 years, and a CLO's lifecycle can be divided into the three epochs delineated in Exhibit 6 as the ramp-up, reinvestment, and amortization. CLOs rarely reach maturity, however, as the equity investors typically call or reset the deal before that date is reached. The reasoning behind the decision to call a deal will be discussed below.

Ramp-Up

The ramp-up period of a CLO consists of both the warehousing period and the first few months after the CLOs closing date. During the warehousing period, the CLO manager will secure a line of credit from a bank to begin building the portfolio of predominantly leveraged loans for the eventual CLO. A CLO warehouse equity investment is a niche form of CLO equity investment wherein the investor contributes the "first loss" equity to secure the line of credit before the deal is priced. In exchange for the risk, the investor receives a leveraged return (typically 4x debt to equity) on the growing portfolio of loans. Warehouse investments are typically short term, lasting just a few months, and the investor is entitled only to the cash flow produced by the portfolio, not any capital appreciation. Otherwise, the merits of a warehouse investment are very similar to a regular way CLO equity investment and warehouse investors often remain equity investors in the CLO after the deal has closed.

At the closing date, the CLO securities are issued, the purchase prices are paid, the warehouse is closed out and the line of credit is paid off using the proceeds from the issuance of the various tranches. By the time of closing, most CLOs have purchased the majority of the target par amount of the portfolio, reducing the cash drag and optimizing returns for the investors. Any remaining purchases required to reach full deployment of the cash must be completed prior to the effective date, which typically occurs within six months of the closing date.

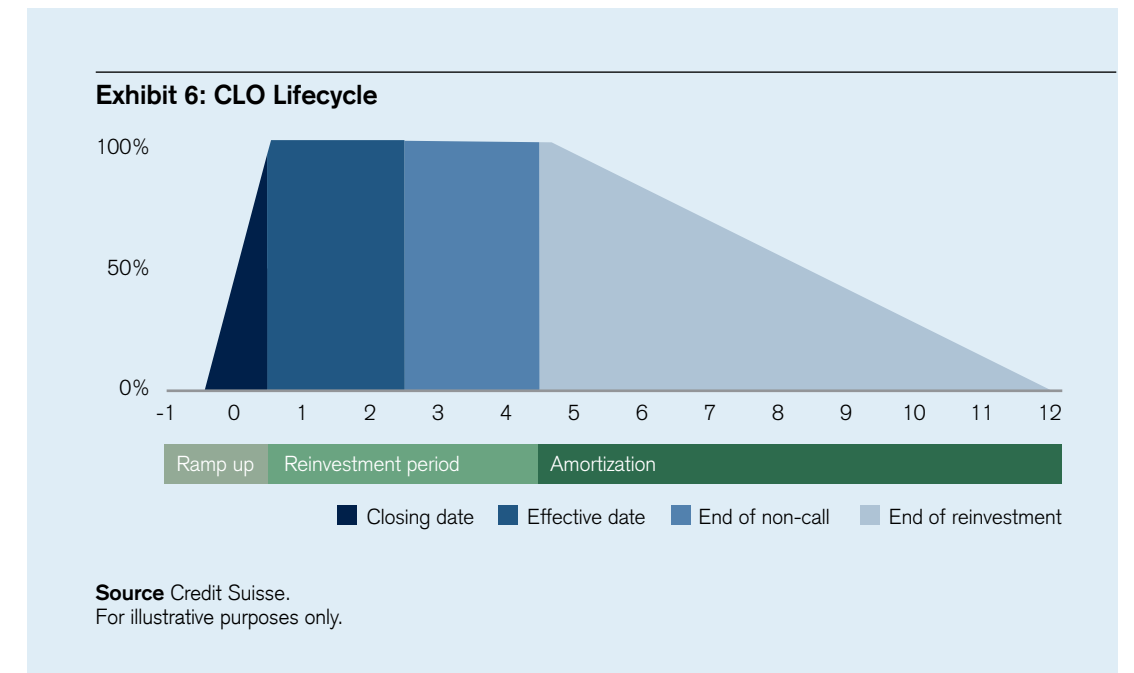
Reinvestment

After the effective date, the reinvestment period begins, typically lasting three to five years from the effective date. During that time, the CLO manager actively manages the portfolio and the CLO issuer pays out interest to the debt tranches according to their associated spread using the interest proceeds produced by the portfolio. The equity tranche receives any residual cash flow after each of the debt tranches is paid their due interest. During the reinvestment period, the CLO manager can actively trade the portfolio subject to certain parameters in the CLO documentation, resulting in principal gains or losses, which ultimately flow to the equity investor. During the first one to two years of the reinvestment period, known as the non-call period, the CLO equity holders are restricted from calling, refinancing, or resetting the debt tranches of the deal.

After the non-call period, the equity investors typically have the ability to call, refinance, or reset the deal with the consent of a majority in principal amount of the equity investors. Calling the deal will be discussed below in the amortization section. In a CLO refinancing, some or all of the debt tranches of the deal are repaid and replaced with new debt which bears a lower spread to reduce the cost of funding, increasing the potential returns to the equity holders. In a CLO reset, the life of the deal is effectively restarted by refinancing the debt and extending the reinvestment period. A reset can be advantageous to equity investors as it extends the life of the deal and pushes out the amortization period, at which time distributions to equity typically compress.

Amortization

The final phase of a CLO is the amortization period, where the CLO manager is no longer permitted to reinvest proceeds from sold, prepaid, or maturing positions with limited exceptions. Tranches are amortized in order of seniority using the principal proceeds. Since tranches are amortized in order of seniority, the lower cost, senior tranches are taken out first, increasing the cost of capital and reducing leverage, both of which typically weigh on equity distributions. A CLO is often called in the first few years of the amortization period since a majority of the equity tranche has the right to call the deal when they decide that the arbitrage is no longer attractive. When the equity investors send in their call notice, the CLO manager will sell all of the assets in the secondary market, the proceeds of which are first used to pay back all of the debt tranches at their principal value along with any accrued interest and residual value is paid to the equity tranche.



Overcollateralization (OC) Test

The overcollateralization tests are concerned with quantifying the asset coverage of a given tranche of the CLO. The test considers the principal value of the CLO loan portfolio to determine how much excess collateral is supporting a given tranche of the CLO. The ratio underlying the test compares the total value of the CLO's portfolio with the par value of a given tranche and all tranches senior to it. The intent is to determine whether the CLO has sufficient cushion to pay back the principal value of the debt tranches. The equation for the simplest calculation of overcollateralization is expressed below.

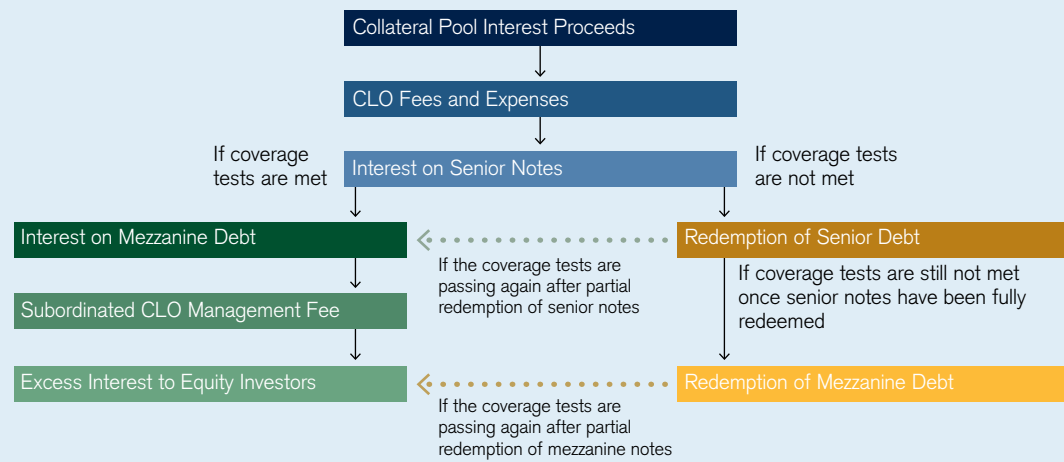
$$\text{Overcollateralization ratio} = \frac{\text{Adjusted loan principal amount}}{\text{CLO debt tranche principal amount}}$$

Collateral Quality Tests

Investors in fixed income are concerned about both the coupon and principal value of their investment. In an effort to protect both, CLOs establish collateral quality tests at issuance. Two examples of such tests are minimum overcollateralization and interest coverage ratios. In most cases, the minimum thresholds must be met before the subordinated notes or equity tranches can receive any payments. For the purposes of interest diversion, the trustee of the deal typically runs collateral tests on a quarterly basis. At that time, if either ratio test is tripped, cash flow is diverted away from the junior tranches either

to repay the principal value of the senior tranches or to purchase additional collateral for the portfolio in an attempt to reestablish the viability of the portfolio. Once the ratio tests are restored to their predetermined thresholds, the normal course resumes within the CLO. The schematic in Exhibit 7 below illustrates the normal order of payments as well as ramifications in the event of a failed coverage test. Aside from interest diversion, CLO managers or investors for various reasons, including for the evaluation or ongoing monitoring of a portfolio, may run collateral tests.

Exhibit 7: Cashflow Waterfall



Source Credit Suisse.
For illustrative purposes only.

Interest Coverage (IC) Test

The interest coverage test considers the interest received from the underlying portfolio to determine how much excess cash flow is available to make coupon payments to a given tranche and all those more senior to it. The IC ratio compares the interest produced by the underlying portfolio to the interest owed to a given tranche and all tranches more senior to it. The intent is to determine whether the CLO produces sufficient cash flow to make interest payments on all debt tranches. The interest coverage ratio is expressed below.

$$\text{IC Ratio} = \frac{\text{Interest from Loan Portfolio (net of senior expenses)}}{\text{Interest due on Debt Tranche and those more senior}}$$

Like the overcollateralization test, guidelines for interest coverage are set at the closing of the CLO.

Glossary

Base Rate: Base rates, like the Secured Overnight Funding Rate (SOFR), fluctuate in time and attempt to quantify the implied market willingness to lend. SOFR is calculated using data from actual market transactions and is published daily by the New York Federal Reserve.

CBO: A CBO is a Collateralized Bond Obligation. CBOs share many of the same attributes as CLOs, except that their collateral largely consists of bonds rather than loans.

Leveraged Buyout (LBO): LBOs are the primary strategy employed by private equity investors wherein they purchase a business by contributing a portion of the value themselves (referred to as the equity check) and finance the remainder with debt that is typically collateralized by the assets of the target company. A large portion of the leveraged loan market.

Mark to Market: Mark to market refers to the revaluing of assets according to the value currently available in secondary markets. If an investor owns a loan with a par value of 100 that is currently trading in the secondary market at 95, the investor can choose to value their portfolio based on the par value of the loan (non-mark to market) or based on the market price (mark to market).

Mezzanine Debt: Mezzanine debt, like eponymous architectural structure, occupies the space between two "levels" in the capital structure of a company, lying between senior debt and equity in its priority.

Non-Call Period: The non-call period is a window of time, normally specified in deal documentation during which the equity tranche is not allowed to call the deal.

Senior Debt: Senior debt is at the "top" of a company capital structure, meaning that it has the highest priority for repayment in the event of default. Its seniority also means that it has lower risk than more junior debt in the capital structure.

Special Purpose Vehicle (SPV): A special purpose vehicle is a bankruptcy-remote legal entity, often structured as a subsidiary of the management company. The bankruptcy-remote status means that if the parent company (usually the CLO manager) were to collapse, the CLO itself would be free from liability. Conversely, if the CLO were to collapse, investors would also have limited recourse against the manager.



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