



Collateralized Loan Obligations

Balancing crucial business lending with
financial safety & soundness

Collateralized Loan Obligations

A look at this asset as a long-term financing solution
for non-investment grade corporations

Serving a very large and important financing source for U.S. businesses, CLOs make business lending more available and affordable – but the market bears watching.

Market participants must continue to remain vigilant in order to maintain credit availability to U.S. businesses in a responsible manner to promote safety and soundness, protect the financial system, and support American economic growth, job creation and success.

BY [Elen Callahan](#), SFA Head of Research

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Key Takeaways

- Collateralized Loan Obligations may sound complex to many outside the financial industry but are simply certain types of business loans packaged into bonds and purchased by institutional investors.
- CLOs serve as a very important financing source for U.S. businesses, making credit more available and affordable to thousands of corporate borrowers with high levels of debt or are rated below investment grade (BBB). CLOs provide 50-65% percent of funding for these companies.
- As the U.S. economy has grown, so has business lending and loans packaged into CLOs to finance the expansion. Additionally, there has been some deterioration of underwriting standards during this time. This has led to appropriate concern about – and closer monitoring of – this financial segment to ensure its safety and soundness in the event of an economic downturn.
- Nonetheless, CLOs are structured in a way to actively manage risk for the bond investors. Asset managers carefully select institutional loans. CLO bonds range from AAA-rated at the top of the waterfall to B-rated and unrated equity at the bottom. CLO bonds performed well during the financial crisis, with no defaults due to collateral deterioration at the AAA or AA notes and less than 0.01% for A and BBB-rated notes. This performance further stands out when juxtaposed to corporate bond performance during the financial crisis when the default rate for investment-grade corporate bonds rose to 0.42% and non-investment grade corporate defaults reached 9.94%.
- Furthermore, even though CLO's performed well in 2008-2010, since the crisis, many aspects of the CLO market are notably more conservatively managed with tighter ratings criteria by ratings level, tighter collateral eligibility requirements and shorter reinvestment periods.

- Although a severe economic downturn may result in meaningful CLO deterioration, we posit that there are several structural mitigants that limit the impact on the broader economy. Today's CLOs lack the synthetic exposure and "re-securitization" structures of past CDOs which were backed by the subordinate bonds of other CDOs or other securitized bonds like subprime RMBS, CMBS and CDOs (e.g., "CDO-squared"). These synthetic CDOs and CDO squared structures – mainly backed by mortgage risk pre-crisis – amplified correlation and credit risk and made these earlier CDOs more susceptible to catastrophic loss. Moreover, the maturities of CLOs liabilities are matched to underlying assets and CLOs do not mark-to-market their loans which protects the CLO market valuation even as the underlying market declines. As noted by Federal Reserve Chairman Powell "while CLOs have facilitated the growth of leveraged loans, many have stable funding: Investors commit funds for lengthy periods, so they cannot, through withdrawals, force CLOs to sell assets at distressed prices."
- As with all asset classes, it is important for industry participants, regulators, and policymakers to continue to monitor risk across the market. Market participants understand that the past does not always predict the future, and the next downturn will not necessarily follow the blueprint of past recessions.

Overview

U.S. companies need financing to innovate, operate, expand, combine and create jobs. Many drivers of today's business and economic expansion succeed because funds for classic American risk-taking ingenuity are more available, at better rates, when their loans are packaged into investment securities—e.g. bonds—called Collateralized Loan Obligations, or CLOs.

CLOs are an important form of structured financing. Like asset-backed securities that help families finance automobile and homes, CLOs help business leaders finance their companies. CLOs are created when banks and other financial institutions combine similar business loans into bonds, which in turn are purchased by investors—including pension and retirement funds—to earn interest income, manage their portfolios, and support growing businesses.

The CLO “securitization” process replenishes funds to lend to thousands of non-Fortune 500 businesses, making credit more available and affordable even to sub-investment grade enterprises working for a chance to grow and thrive.

While fueling America's corporate growth, CLOs help to expand the investor base in business loans, bringing more liquidity and stability to this important market. Through fixed income mutual funds or closed end funds, CLOs give investors, such as families building college, retirement and other nest eggs, a floating rate investment alternative with a history of strong credit performance—while also adhering to post-Recession financial reforms.

As the U.S. economy has grown, so has business lending and loans packaged into CLOs to finance the expansion. This has led to appropriate concern about—and closer monitoring of—this financial segment to protect investors and financial system safety and soundness.

This SFA paper discusses the CLO market, issues raised, and how CLOs help to support business lending, while also supporting the market view that vigilance is warranted with an eye toward balancing and preserving the shared twin goals: Protecting investors and the financial system, while keeping credit flowing to U.S. companies and the economy in a responsible way.

The CLO Explained: Basics

A CLO is a fixed-income bond that holds and manages a diversified portfolio of corporate leveraged loans. The underlying leveraged loans are term debt instruments issued by companies with ratings below investment grade and with higher debt service costs relative to earnings versus investment grade companies. Each CLO is structured according to various investor and rating agency criteria, with empirically based levels of safeguards including credit enhancement and portfolio-specific tests and

mechanisms that are meant to protect investors against some of the potential risks of the investment. Importantly, CLOs are actively managed by professional credit managers whose loan selection and reinvestment decisions have a material impact on the quality of the underlying portfolio. Through the infrastructure of securitization, CLOs allow institutional investors to take an investment position in the corporate sector directly in proportion to their risk appetite, which in turn supports the growth of non-investment grade companies and their ability to borrow. That is, investors with high risk appetite can invest in lower rated tranches that offer initially higher yields, while investors with lower risk preferences can purchase bonds that enjoy the credit enhancement – or loss absorption – of these higher yielding/lower rated tranches. Such mechanisms allow businesses to finance themselves all-in at lower interest rates, while matching credit risk with investor preferences in an efficient system.

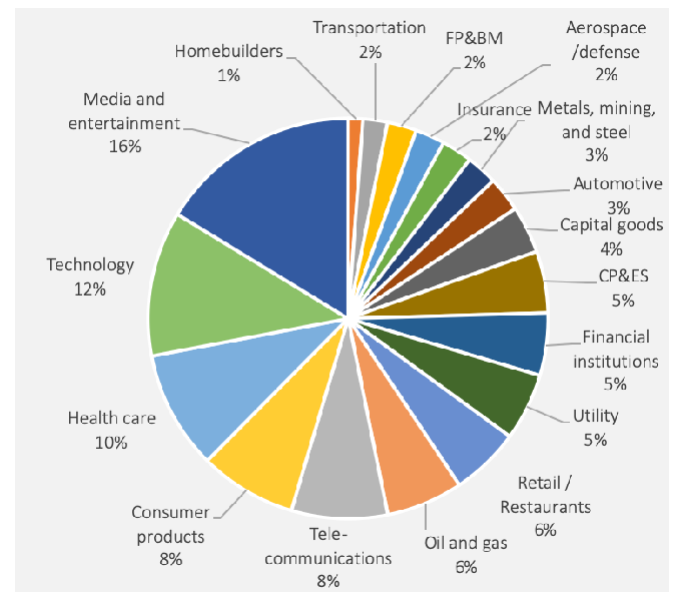
CLO collateral typically reflect the diversity of U.S. industries as represented in the non-investment grade U.S loan universe. These companies use these loans (known as “leveraged loans”) to finance mergers and acquisitions activity, refinance existing debt, manage a company’s capital structure and for general operating purposes.

Exhibit 1: Top 10 obligors of CLO and lev loan universe

Top 10 obligors in CLOs

Asurion LLC	Insurance
TransDigm Inc	Aerospace and Defense
American Airlines	Airlines
Vistra Operations Company	Electric Utilities
Dell International	Technology
CSC Holdings LLC (Cablevision)	Media
CenturyLink Inc	Diversified Telecomm
Bausch Health Corporations	Pharmaceuticals
Univision Communications	Media
Albertson's LLC	Food and Staples

Leveraged Loans: by industry type



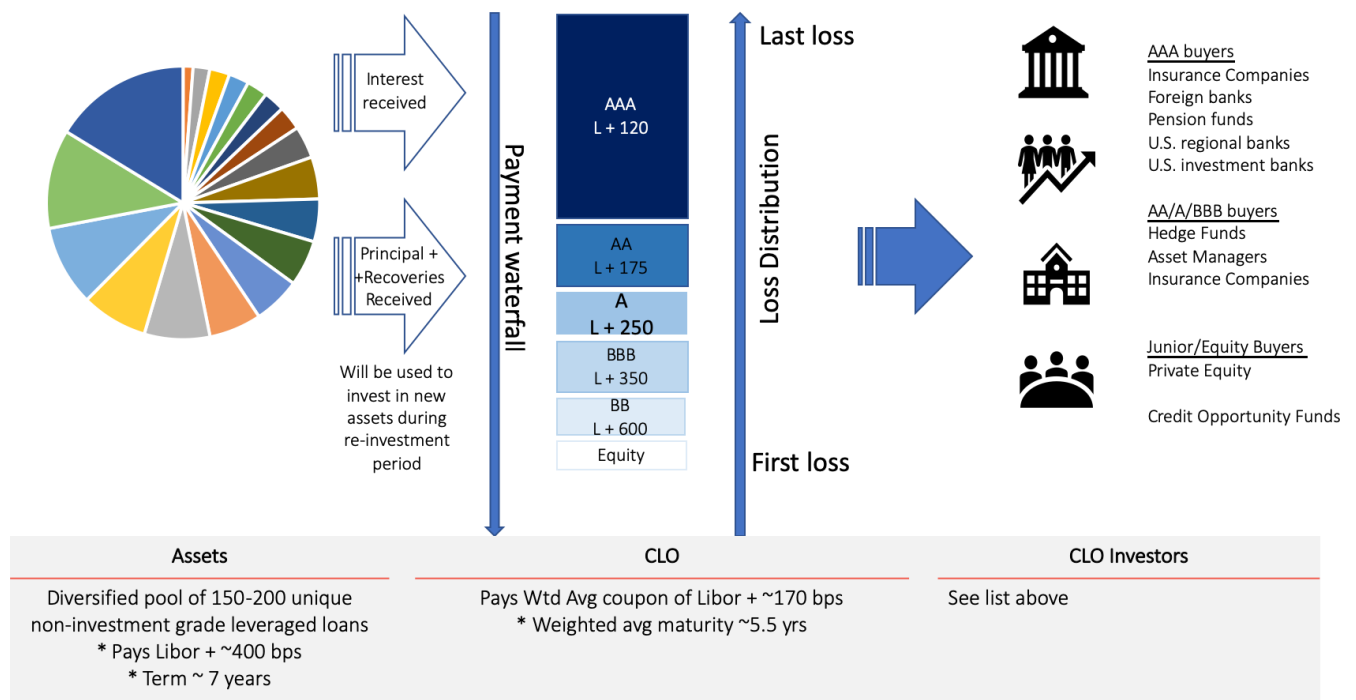
Source: S&P Global Ratings – “The Most Widely Referenced Corporate Obligor in Rated U.S. BSL CLOs: Second-Quarter 2019” July 8, 2019

The CLO Explained: Investment Structure

CLOs are investment vehicles that invest in a diversified pool of senior secured leveraged loans by issuing tranches of debt and equity. The debt tranches are typically rated by at least two rating agencies, with credit ratings from triple-A, the most senior tranche, down through the most junior tranche, either double-B or single-B.

CLO bonds are directly repaid from interest and principal paid on the underlying corporate loans with the senior most triple-A bond being paid first, followed by the mezzanine and the most junior notes. The equity piece, which is not rated, sits below all the debt bonds and is only paid to the extent that the structure has excess cash once the management fees, debt coupons, and subordinated fees are paid. Any principal payments received during the reinvestment period (typically a two- to five-year period) are reinvested (the manager can either purchase or sell bank loans to improve the portfolio’s credit quality) or used to cover any interest shortfall. Principal payments during the amortization period are used to pay down note principal sequentially. This priority of payments is also called the payment waterfall.

Exhibit 2: From loans to CLOs



Source: SFA, Fitch Ratings

Crucial to the CLO structure is the minimum required credit enhancement levels based largely upon the collateral quality and deal structure. For a bond to attain a triple-A rating, it should be able to withstand an extreme level of stress without going into default. “Extreme” in the case of S&P’s triple-A equates to unemployment rate greater than 20%, a GDP decline greater than 15%, and stock market index decline of less than 70%. Compare this to a bond with a single-B rating where a “mild” level of stress may result in a missed payment. “Mild” is defined by S&P as unemployment rate of less than 6%, a GDP decline of 0-0.5% and a stock market decline of 0-10%. The senior bonds are the most protected from credit losses, as losses are absorbed first by the equity piece, then from the junior-most bonds to the triple-A bonds. Pricing reflects the risk/reward position of the bonds with the safest, most senior triple-A piece receiving the lowest return and the equity piece, the highest return.

Credit enhancement is found in the form of “overcollateralization”, “excess spread” and/or “subordination”, as discussed in Exhibit 3 below. CLOs are also designed with dynamic coverage tests which address variability of cash flow used to repay the CLO bonds (i.e., principal and interest payments on the underlying leveraged loans) and when breached redirect cash flow to protect most senior bonds or to replenish levels of credit enhancement. KBRA summarizes CLO credit enhancement features here:

Exhibit 3: Structural protections - credit enhancement and coverage test

Protection Type	Summary	Purpose	Key Drivers
Subordination	Requires cash flows from the collateral pool to be paid out in sequential priority	Creates priority claim for senior noteholders and cushion against losses	Amount of junior notes and equity in the structure: more creates more and vice versa
Overcollateralization	CLO maintains a portfolio with greater par balance than outstanding balance of rated debt	Creates first-loss equity tranche, which is unrated and provides cushion against principal losses to rated debt	Amount of equity in the structure: more creates more as proceeds from sale of equity used to buy collateral over and above rated debt notional
Excess Spread	Interest generated by the collateral pool is greater than interest owed to rated debt, creating excess available interest for the transaction	Creates additional cash buffer that can be captured and used to replenish lost senior credit enhancement	Arbitrage: portfolio construction, cost of debt and expenses, performance of assets over time
Interest Coverage Test	Ratio: Interest available / Cumulative interest due to rated debt at target rating level	Ensure adequate interest coverage. A breach of ratio thresholds triggers a return of principal (reduce test denominator) to most senior class until the test is back in compliance	Portfolio construction, cost of debt and expenses, performance of assets over time

Interest Diversion Test: (During reinvestment period only)	Ratio: Collateral par / outstanding balance of total rated debt	A breach of ratio forces the manager to purchase additional collateral using interest proceeds (increase test numerator) until the test is back in compliance. Usually only one test in transaction.	Asset selection (risk assets get haircut in numerator), performance of assets over time (downgrades to CCC, defaults)
Overcollateralization Test	Ratio: Collateral par / outstanding balance of cumulative rated debt at target rating level	Ensure adequate par coverage. Breach of threshold triggers a return of principal (reduce test denominator) to most senior class until the test is back in compliance and subsequently stops interest payments to debt below the test. Separate tests for most classes of notes.	Asset selection (risk assets get haircut in numerator), performance of assets over time (downgrades to CCC, defaults)

Source: KBRA

An important coverage test for CLOs is the exposure to loans with ratings of Caa1/CCC+ or lower (“the triple-C bucket”). CLOs are typically structured to hold 7.5% of loans in this bucket, although some have lower limits. If this limit is breached, the CLO’s protective cushion against losses, or overcollateralization, will be considered jeopardized and cash flow may be diverted away from junior classes to protect senior classes. To cure a breach, CLO managers will seek to sell these lower-rated loans, often at some discount.

Arguably one of the most important credit enhancement component in the CLO structure is the contribution of an active, seasoned portfolio manager. The ability of a manager to impact CLO performance is clear when considering the CLO’s life cycle. For 6-9 months

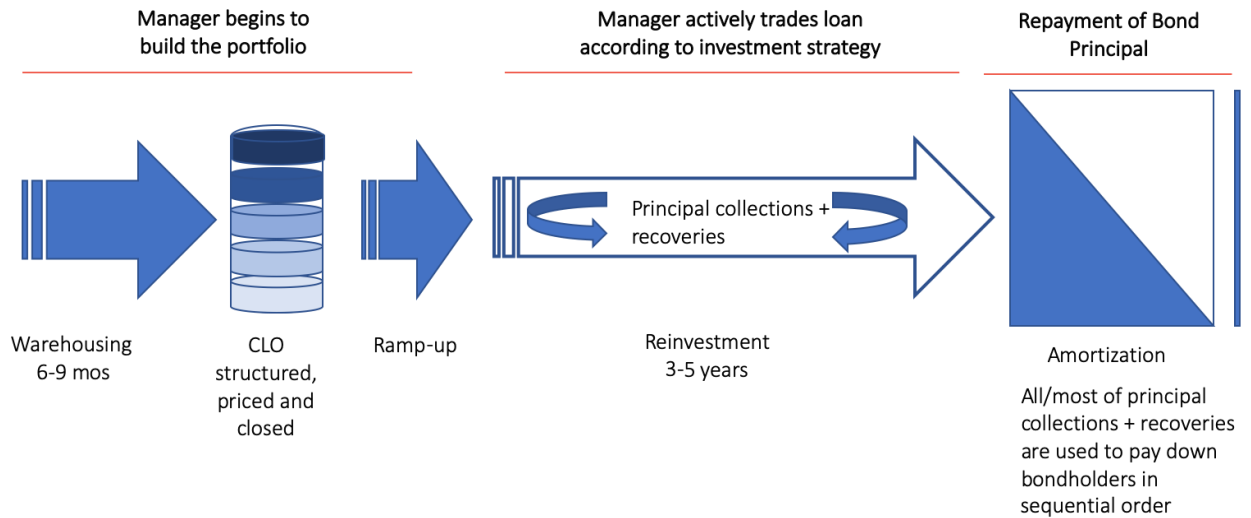
before a CLO is priced, the manager has been purchasing loans in a warehouse facility to meet a specific investment strategy. Once the CLO is sold to capital market investors, the manager has a few more months to finalize the pool of assets before a 2 – 5-year reinvestment period kicks off. During this period, the manager is actively trading loans within pre-defined parameters of the CLO structure, using funds generated by principal payments from the underlying pool. Interest payments generated by the loan pool are passed through to the bond holders sequentially from highest to lowest rated as interest

Composition of CLO loan portfolios

This is an area worth watching as CLO managers have increasingly purchased more loans rated single-B or single-B minus, the rating levels immediately above the pivotal triple-C level and historically vulnerable to rating downgrades. According to S&P, the average exposure of CLOs to loans rated single-B minus reached a new high of 20% in 2019, up from 15% in 2018. Of these loans, 18% carry a negative rating outlook from the rating agency. S&P’s CLO index currently shows that on average 4.6% of the loans held by today’s CLOs are rated at triple-C or below, well within the 7.5% limit of most CLO structures.

payments on each bond. Once the reinvestment period ends, the structure enters the amortization phase, the manager’s ability to trade stops or is drastically limited, and the principal on the bonds are repaid in sequential order from highest to lowest rated.

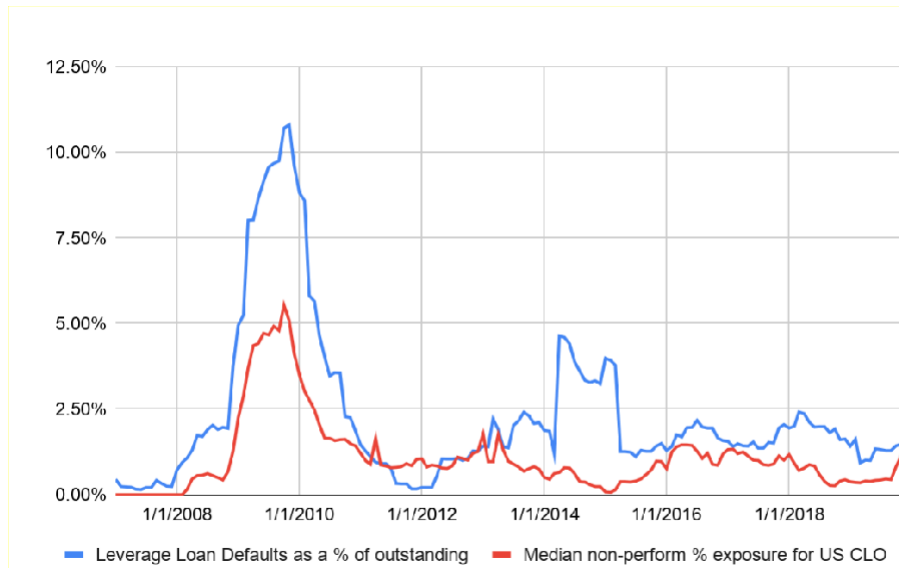
Exhibit 4: CLO lifecycle



Source: SFA

To date – including through the 2008 financial crisis - no triple-A CLO bond has defaulted. Only one double-A bond has defaulted which was due to a flaw in the structure and not to deterioration in the underlying collateral. Indeed, out of 11,409 CLO tranches rated by S&P between 1994 and 2019, only 40 tranches, or 0.004% of the rated tranches, have defaulted; 22 of the defaulted tranches came from the double-B slice. All of the defaulted tranches came from CLOs issued between 1994-2009; none of the tranches issued from CLOs between 2010 to present (also known as CLO 2.0) experienced a default. Importantly, these CLO 2.0s benefit from more conservative structures. For example, the subordination level for the triple-A bonds of a CLO 2.0 structure may be up to 40% higher than the subordination level of a CLO 1.0 structure.

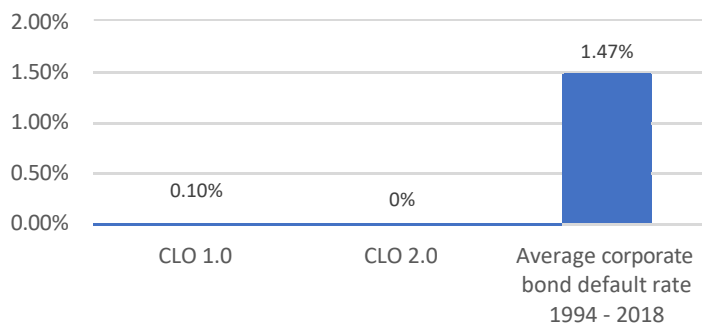
Exhibit 5: Actively managed CLOs have consistently shown lower rate of non-performing leveraged loans



Note: Red line represents the percentage of non-performing loans held by S&P-rated CLOs. S&P defines non-preform as loans with ratings of ‘CC’, ‘SD’, or ‘D’.

Source: S&P Global Ratings

Exhibit 6: Default rate comparisons – CLOs vs. corporate bonds



Source: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

Rating	Cumulative Defaults: by rating levels	
	CLO	Corporates
AAA	0.0%	0.9%
AA	0.1%	1.1%
A	0.3%	2.1%
BBB	0.5%	5.1%
BB	1.5%	15.8%
B	1.1%	28.3%

Source: S&P Global Fixed Income Research

The CLO Explained: The Collateral

One of the drivers in CLO performance has been the strength of its collateral. Using a combination of debt and equity offerings, U.S. companies access the capital markets to grow their business and manage their operations. This combination of financing, also known as a company's capital structure, may be a mixture of long- and short-term debt as well as common and preferred stock.

Leveraged loans are floating-rate term debt instruments, with maturities of 5-7 years, that are typically used by corporate borrowers with higher debt relative to earnings and credit ratings that are below investment grade. For these companies the cost of issuing unsecured bonds may be too onerous. Leveraged loans, which are arranged and distributed by large sell-side firms and are priced and traded in the secondary market, provide these corporate borrowers an important access to institutional funding. To compensate investors for higher perceived credit or default risk, leveraged loans offer yields that are markedly higher than higher-quality investment grade debt and are backed or secured by an issuer's assets, property or rights to inventory or receivables.

Exhibit 7: Typical yield comparison

Yield	
5-year Treasury	1.67%
Triple-A bond 6-yr maturity	2.23%
S&P Leveraged Loan 100 Index	5.79%

Source: SFA

As loans typically sit in the senior-most position in a company's capital structure, in the event of a bankruptcy, leveraged loans are repaid before senior unsecured bonds, subordinated bonds and equity. This has historically led to higher recovery rates than subordinated debt instruments, although actual recovery experience will vary depending on issuer, industry or macro related factors. According to S&P Global, leveraged loans have an average recovery rate of 79% compared to 66% for senior secured bonds and 47% for senior unsecured bonds. Leveraged loans have terms in the contract for the safety of the lender called covenants that requires the company to operate within certain rules such as requirements to furnish audited financial statements, maintain adequate insurance and/or refrain from entering into certain actions that could result in the deterioration of their ability to repay existing debt. Historically, leveraged loans have included fairly stringent "maintenance" covenants which are tied to a borrower's financial performance and may, arguably, act as an early indication of a borrower's financial distress. If breached, the lender typically can take several actions such as demand immediate repayment of the loans, increase the interest rate on the loan, increase the amount of collateral and/or waive the covenant following some sort of loan renegotiation, often with more stringent loan terms.

Today's low-default environment has given rise to borrower-friendly developments. The most talked about of these are the covenant-lite (or cov-lite) loans that incorporate borrower-favorable terms such as liberal EBITDA add-backs and opportunities for collateral stripping. "EBITDA add backs" add back one-time or extraneous expenses to earnings, thereby increasing EBITDA and improving a borrower's perceived capacity to repay. Collateral stripping occurs when borrowers move collateral out of the reach of secured lenders, effectively harming the recovery value of secured loans in the event of a bankruptcy event.

What is a cov-lite loan

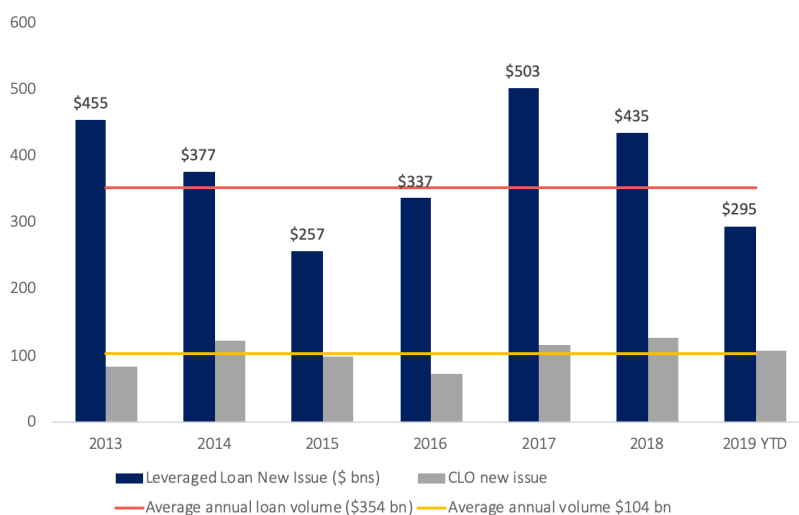
Cov-lite loans closely resemble senior secured bonds in that, like bonds, these loans contain incurrence covenants that are only triggered if the borrower takes some sort of action — such as adding on more debt or making an acquisition. In these cases, the incurrence covenant limits a borrower's ability to take such action. Cov-lite loans lack the more restrictive maintenance covenants found in traditional covenant heavy loans that require borrowers to meet regular, often quarterly, financial tests. It's worth noting that in cases where the borrower also has access to a revolving credit facility, the revolver always requires financial covenant protection that indirectly impacts the cov-lite loan. While some argue that the presence of maintenance covenants provides lenders with an important, early warning signal of financial distress, others have noted that the presence of restrictive, maintenance covenants may push a distressed borrower over the edge, as the cure becomes financially burdensome to the borrower.

The lack of maintenance covenants has some impact on loan recovery. For companies that exited bankruptcy between January 2014 and December 2017, the average recovery rate on cov-lite loans was 72%, compared to 82% for non cov-lite loans, according to S&P Global Ratings. It is worth noting that the sample size for this evidence is very small, at 17 observations. In addition, as covenants have evolved, the required credit enhancement to protect against these changes as increased, too.

Cov-lite loans are not new to the leveraged loan space but were limited to higher credit quality borrowers. On average, cov-lite loans only represented about 14% of the annual leveraged loans issued pre-crisis. By 2012, that number was closer to 40% and peaked at 80% in 2018. Today, cov-lites make up 75% of loans outstanding. However, lacking historical data across various market conditions, the jury is out on how cov-lite loans will perform in an economic downturn. Generally speaking, cov-lite loans are considered negative from a recovery perspective relative to more traditional covenant-heavy loans. Some market participants are calling for recovery rates in line with senior secured bonds, given the similarities between the two instruments. As with covenant-heavy loans, actual recoveries will be impacted by a company’s overall debt structure, asset quality and market conditions. In SFA’s view, as discussed in more detail below, CLO backed by cov-lite loans do not pose systemic risk given, among other considerations, the relative size of the market and the more overall conservative protections for CLO investors, but they are an area of the CLO market that is worth watching. Importantly, SFA investor members agree, and thus pricing and demand is reflective of shifting investor demands and preferences.

Despite these concerns, the still-benign credit environment and robust corporate balance sheets have helped fuel the growth of the leveraged loan market. Investors include banks, finance companies and institutional investors, such as hedge funds, high-yield bond funds, pension funds, insurance companies and, in no small part CLOs. Since 2013, an average of \$350 billion of new leveraged loans issued annually. During this same period an average of \$104 billion of CLOs backed by leveraged loans, were issued annually. In 2018, the notional amount of loans outstanding cleared the \$1 trillion mark for the first time in its history; CLO outstanding was about \$700 billion as of Q2 2019.

Exhibit 8: Issuance volume (in billions)



Source: S&P Global Ratings, Bloomberg

What we're watching

The end of LIBOR

Leveraged loans and CLO bonds have historically been indexed to LIBOR. The end of LIBOR, which is expected in 2021, and the impending transition away from this benchmark may be messy for legacy CLOs if the industry does not come to an agreement on the standard fallback language before the benchmark goes away. For a more detailed discussion on the transition risks including litigation risks around legacy instruments, please see our discussion [here](#). The good news, however, is that the Fed-convened Alternative Reference Rates Committee (ARRC), of which SFA is a member, has been exploring various possibilities including a possible legislation solution. Please see our discussion [here](#) on a possible legislation solution proposed for New York State.

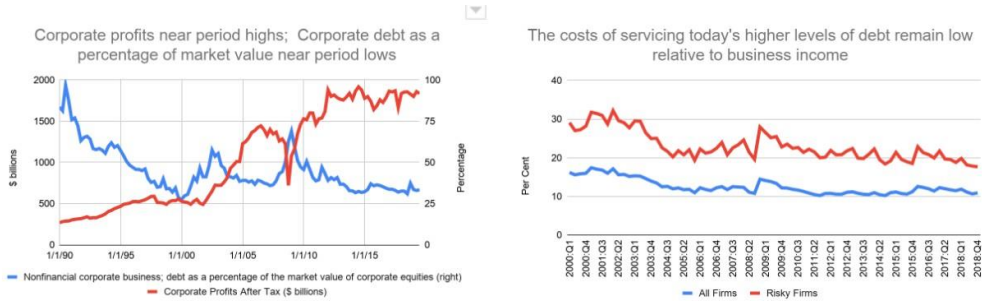
Rising credit risk

Much has been said about the shifting credit profile of the leveraged loan universe and the level of indebtedness of U.S. corporations. We looked at the rise of more borrower-friendly terms in our discussion of the loan collateral and, in our discussion on the CLO structure, the increasing risk that CLOs face to loans rated triple-C and below. Below we take a look at the level of corporate debt.

Although the level of corporate debt has been rising since the financial crisis, and now represents close to 50% of GDP, that in and of itself should not be a cause for alarm as a certain level of risk taking is key to the healthy functioning of the capital markets and therefore important for economic growth. Additionally, the rise in corporate debt has been consistent with the rise in corporate profits and market values. The graph below shows that today corporate debt is a third of the market value of corporate equities and corporate profits after tax stand at \$1.8 trillion; compare this to Q4 2008 when debt was 62% of market value and corporate profit was \$721 billion. Additionally, still-low interest rates have helped kept debt service burdens manageable.

To the extent that we see a slowdown in global macroeconomic variables, today's debt levels may pose a challenge for vulnerable corporates with higher levels of debt relative to earnings. Using data from high-yield bond markets as a proxy for the leveraged loan markets, the Financial Stability Board recently examined the vulnerabilities and potential financial stability implications of higher levels of corporate indebtedness. Their analysis shows that the correlation between the level of corporate leverage and downgrades increases during an economic downturn (left graph), with higher leveraged corporates exhibiting stronger correlation. The correlation between high-yield downgrades and high-yield bond and leveraged loan default rates also increases during this period.

Exhibit 9: Current state of corporate debt

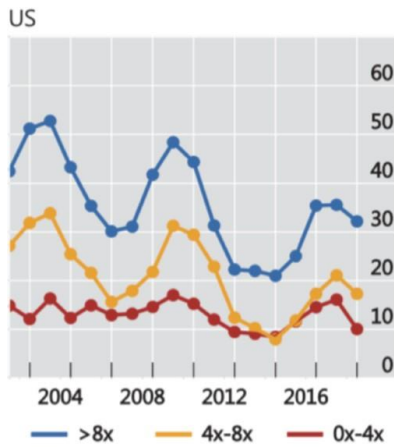


Source: Economic Research, Federal Reserve Bank of St Louis

Note: Series calculated as the ratio of total interest expenses to earnings before interest, depreciation, and taxes. Risky firms are firms with positive debt that are either rated as speculative grade by S&P or unrated.
Source: Federal Reserve Board staff calculations based on S&P Global, Compustat.

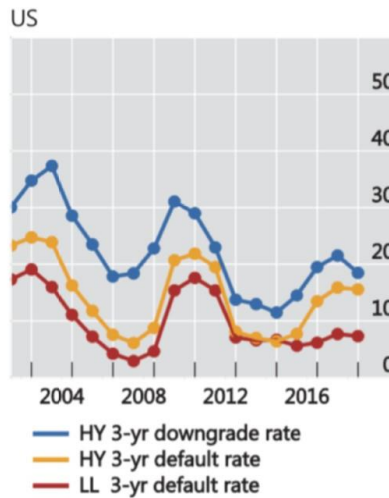
Exhibit 10: Correlation with corporate downgrades

Correlation (in %) between high levels of corporate indebtedness and downgrades



Corporate indebtedness is calculated as Gross debt/EBITDA. Downgrade defined as one full downgrade. Sources: Refinitiv, Moodys, FSB

Correlation (in %) between high yield corporate downgrades and defaults (3yr cumulative rates) R²=0.7924



Sources: Capital IQ, FSB

Source: Financial Stability Board

During a period of high market vulnerability, we would first expect to see further and pronounced tiering of CLO platforms based on manager quality as increasingly risk-averse investors look for managers who have proven track records of navigating choppy economic waters. Higher levels of indebtedness may also lead to lower recoveries on defaulted assets which would contribute to

structural stress on CLOs. To the extent that a deterioration in the underlying leveraged loan assets breaches structural triggers in CLOs, lower-rated junior tranches will be most vulnerable as cash flow shifts to protect senior tranches.

Systemic Risk?

In discussions of risks to the broader financial systems, CLOs have been incorrectly compared to subprime CDOs, the structured credit product that is widely cited as having contributed to the 2007-2008 financial crisis. CDO, or collateralized debt obligation, is the general term for a structured finance instrument that is backed by bank loans (as in the case of CLOs) or a pool of bonds or other debt instruments (such as the case with structured finance CDOs or CBOs, collateralized bond obligations). It's important to note that while CLOs utilize similar structural technology the similarities end there.

Exhibit 11: Key features of CDOs then and CLOs now

	CDOs in 2007	CLOs in 2018
Types of Underlying Asset	<ul style="list-style-type: none"> Non-Agency MBS, other CDOs and ABS, CDS 	<ul style="list-style-type: none"> Leveraged loans
Size of Underlying Market	<ul style="list-style-type: none"> \$2.4 trillion non-agency MBS \$978 billion CDOs \$851 billion ABS 	<ul style="list-style-type: none"> \$1.2 trillion
Complexity		
Resecuritization (CDOs that invested in other CDOs)	<ul style="list-style-type: none"> 14% of outstanding 	<ul style="list-style-type: none"> Minimal
Synthetic securitization (through CDS or other derivatives)	<ul style="list-style-type: none"> 40-50% of issuance 	<ul style="list-style-type: none"> Minimal
Maturity transformation (i.e., long-term CDO assets funded with short-term liabilities – creating forced sellers)	<ul style="list-style-type: none"> Common to fund via short-term as repurchase facilities SIVs funded with short-term ABS commercial paper 	<ul style="list-style-type: none"> Minimal

Source: BIS Quarterly Review, September 2019 and SFA

At the end of 2008, \$525 billion of CDOs were backed by subprime mortgage bonds. These CDOs mostly held interest in pools of mortgage loans made to subprime consumer borrowers. A decline in housing prices therefore led to the underperformance of these subprime CDOs. Synthetic CDOs and CDO squared amplified correlation and credit risk that made CDOs more susceptible to catastrophic loss.

Add to the mix, loose and often fraudulent underwriting practices on the underlying mortgage loans as well as general market assumptions that typically didn't presume large nation-wide home price declines were likely or even possible, and losses were in many cases much more severe than expected.

The difference in subprime CDOs and CLOs is notable when looking at their respective default history.

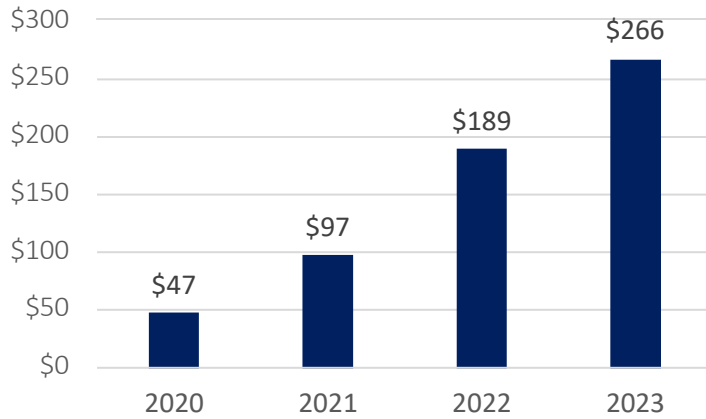
Exhibit 12: Default rate for CDOs vs CLOs

	Year CDO issued (vintage)	Default Rate
Mostly subprime RMBS CDOs or CDO re-securitizations	2000	0.0%
	2001	0.0%
	2002	0.0%
	2003	0.0%
	2004	10.0%
	2005	2.0%
	2006	3.8%
	2007	5.3%
	2008	0.0%
	2009	0.0%
Mostly leveraged loan CLOs	2010	0.0%
	2011	0.0%
	2012	0.0%
	2013	0.0%
	2014	0.0%
	2015	0.0%
	2016	0.0%
	2017	0.0%
	2018	0.0%

Source: S&P Global Ratings

Fast forward 10 years and to concerns around the risks that CLOs pose to the broader system. A severe economic downturn may result in meaningful CLO deterioration, particularly if forced selling of CLO securities were to occur. Deterioration may be exacerbated by the refinancing activity coinciding with such downturn. This may have a negative impact on the broader system given the size of the leveraged loan market and its impact on the real economy. We posit, however, that there are several mitigants to this scenario.

Exhibit 13: 4-year maturity schedule for speculative grade bank loans (in billions)



Source: Moody’s Investors Service, January 2019
 Note: Data represents U.S. & Canada MIS rated corporate loans

Today’s CLOs are much simpler vehicles, lacking the synthetic exposure and “re-securitization” structures of past CDOs where the underlying collateral is mostly subordinate bonds of other CLOs or other securitized bonds like subprime RMBS, CMBS and CDOs (e.g., “CDO-squared”). CLO 2.0 also lack the more complicated internal structures found in subprime RMBS CDOs such as a super-senior class which allowed cash flow to be diverted to a small minority security . Moreover, the maturities of CLOs liabilities are matched to underlying assets and CLOs do not mark-to-market their loans which protects the CLO market valuation even as the underlying market declines.

Exhibit 14: CLO investors

AAA Notes	Mezzanine Notes	Equity
<ul style="list-style-type: none"> ▪ Insurance Companies 	<ul style="list-style-type: none"> ▪ Hedge Funds 	<ul style="list-style-type: none"> ▪ Private Equity
<ul style="list-style-type: none"> ▪ Foreign Banks 	<ul style="list-style-type: none"> ▪ Asset Managers 	<ul style="list-style-type: none"> ▪ Credit Opportunity Fund
<ul style="list-style-type: none"> ▪ Pension Funds 	<ul style="list-style-type: none"> ▪ Insurance Companies 	
<ul style="list-style-type: none"> ▪ U.S. Regional Banks 		
<ul style="list-style-type: none"> ▪ U.S. Investment Banks 		

Source: FitchRatings

Conclusion

The CLO industry that thrives on supplying safe and sound credit and liquidity is keenly focused on the reasonable concerns raised and seeks to be a partner and leader in providing solutions to protect this crucial market. CLOs allow investors with different risk appetites to invest in bonds with different levels of risk and yield. However, while CLOs allow for this efficient segmentation of risk, the market must remain vigilant to protect against a wholesale degradation in the underlying collateral. Nor do we want to see a pricing bubble that would lead to excessive financial risk-taking which could challenge the overall stability of the economy. These challenges are not an indictment of the CLO market writ large, but they do bear watching as CLO funding is critical to the functioning of lower grade corporate borrowers of all sizes. In addition, SFA investor members are keenly focused on the value of the collateral in which they invest, and while some curtailment of cov-lite investing can already be seen, appetite for well underwritten CLO's remains strong.

Given the importance of business lending and how CLOs bring greater liquidity, certainty and lower-cost lending to support the economy, SFA is focused on helping to prevent and mitigate any possible systemic impact by supporting research, surveillance, market discussions, and solutions to support and strengthen this critical financial sector, investors and role of CLOs in our financial system. We support monitoring and managing today's risks with an informed, steady and prudent approach, and taking steps as necessary in a responsible and responsive way.

About the Structured Finance Association

The Structured Finance Association (SFA) is the leading securitization trade association representing over 360 member companies from all sectors of the securitization market. Our core mission is to support a robust and liquid securitization market and help its members and public policymakers grow credit availability and the real economy in a responsible manner. SFA provides an inclusive forum for securitization professionals to collaborate and, as industry leaders, drive necessary changes, advocate for the securitization community, share best practices and innovative ideas, and offers professional development for industry members through conferences and other programs. For more information, visit www.structuredfinance.org.

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