

CLO Market Mini-Primer

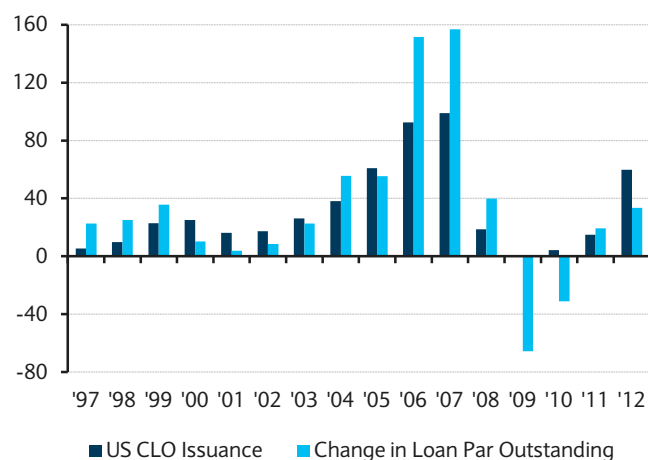
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CLOs are virtually unique among pre-crisis structured products, in that their soundness was demonstrated during and after the 2008 financial crisis. The overwhelming majority of pre-crisis CLO tranches have returned to their original credit ratings, and no AAA or AA rated tranche has yet suffered a credit loss. With the model proven, investors across the risk spectrum have returned to the product, facilitating a 203% CAGR in new CLO issuance over the past eight quarters. With this growth has come a reasonably well-defined standard structure, often called CLO 2.0, that in many ways is even safer than the pre-crisis CLOs that successfully navigated the downturn. With investors of all types seeking alternatives to duration exposure, the floating-rate nature of most CLO securities (and the collateral that supports them) is well suited to today's investment environment.

CLOs first came into existence in the early 1990s, when banks began using nascent securitization techniques to repackage balance sheet loans, freeing up lending capacity. By the late 1990s, dealers and asset managers had become involved, and CLOs gained wider acceptance as a means of distributing the comparatively uniform credit risk associated with leveraged corporate borrowers across a wider range of investors. After several years of issuance in the \$20bn per annum range, new CLO creation exploded during the credit boom of the mid-2000s, reaching a peak of nearly \$100bn per year in 2006 and 2007 (Figure 1). The dramatic acceleration in CLO issuance drove a corresponding increase in the overall size of the leveraged loan market, which grew from barely \$100bn in total par at the end of 2003 to more than five times that size by the time the financial crisis hit in 2008 (Figure 2).

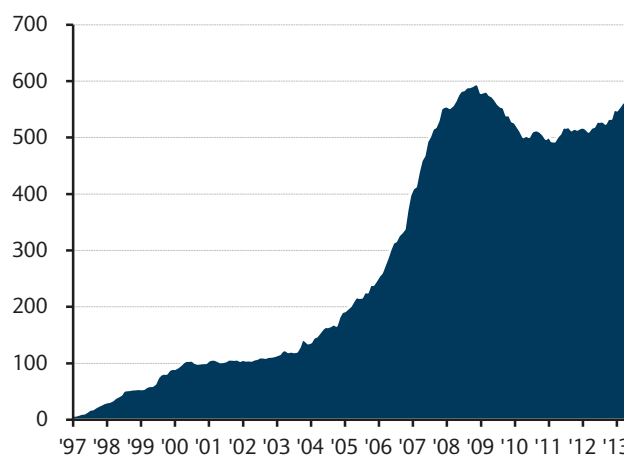
CLO creation stopped in the wake of the financial crisis, with no new deals in the U.S. between mid-2008 and March 2010. With its primary buyer sidelined, the loan market shrank as issuers turned to the high yield bond market for refinancing. However, as markets began to recover and evidence mounted that CLOs had performed largely as expected through the downturn, new CLO creation resumed, allowing the loan market to stabilize and then grow again. While various regulatory challenges lie ahead, CLOs have clearly re-established themselves as the most important purchaser of leveraged loans, as well as a potentially attractive investment opportunity for investors of all risk appetites.

FIGURE 1
Annual U.S. CLO Issuance and Change in LSTA Leveraged Loan Index Par Outstanding (\$bn)



Source: Creditflux, S&P LCD, Barclays Research

FIGURE 2
LSTA Leveraged Loan Index Total Par Outstanding (\$bn)



Source: S&P LCD

CLO 2.0: Safer, Stricter, and Yet Still Wider

Like most structured and derivative products during the pre-crisis period, legacy CLOs did not adhere to a consistent standard in terms of overall size, liability structure, and the rules governing management of the collateral portfolio. The particular characteristics of each deal were determined by a combination of manager track record and reputation, dealer creativity, and investor appetite for specific risk exposures. However, despite the varied nature of pre-crisis deals, the one trait that was shared by nearly all such structures is that they were aggressively leveraged. At the peak of the pre-crisis credit boom, as investors baked in assumptions of a permanent decrease in volatility (the so-called Great Moderation), AAA tranches made up nearly three quarters of the overall capital stack, mezzanine tranches became very thin, and total leverage to CLO equity holders was consistently 12-13x.

Safety First in Structuring

The ensuing credit crisis and recession altered perspectives in numerous ways, resulting in a much different landscape when issuance resumed in 2010. For a start, investor assumptions regarding default correlation and potential loss severity were reset by the large number of corporate borrower defaults and surprisingly low average recoveries realized in 2009. This experience resulted in a general reduction in appetite for leveraged investors across the entire risk spectrum. Meanwhile, rating agencies significantly amended their CLO rating methodology (and did so for other structured products as well), requiring more conservative capital structures to achieve the same assortment of tranche ratings. The net result was a permanent shift in CLO capital structures, along the lines of what is depicted in Figure 3.

FIGURE 3

Indicative Capital Structure of Pre-Crisis (1.0) and Post-Crisis (2.0) CLOs

Class of Notes	CLO 1.0 (Pre-2008)			CLO 2.0 (2010 to Present)		
	% of Notional	O/C Ratio at Issue	Rating (S&P/Mdy's)	% of Notional	O/C Ratio at Issue	Rating (S&P/Mdy's)
A	72%	129%	AAA/Aaa	61%	140%	AAA/Aaa
B	7%	121%	AA/Aa2	11.5%	128%	AA/NR
C	5%	116%	A/A2	7.5%	120%	A/NR
D	5%	111%	BBB/Baa2	5%	115%	BBB/NR
E	3%	108%	BB/Ba2	5%	110%	BB/NR
Equity	8%	N/A	NR/NR	10%	N/A	NR/NR

Note: For illustrative purposes only. Source: Barclays Research

Several aspects of the shift are worth highlighting. First, the size of a typical AAA rated tranche has shrunk considerably, from nearly three quarters of total notional during the pre-crisis period to barely more than 60% today. Since AAA liabilities carry the tightest spreads, the weighted average cost of CLO liabilities is significantly increased by this change. On the opposite end of the capital stack, equity tranches have grown in size, as overall leverage to equity holders has fallen from 12-13x at the pre-crisis peak to an average closer to 9x during the post-crisis period. The combination of lower leverage and a higher average cost of debt has negative consequences for equity returns, although wider collateral spreads provide an offset to this effect.

While AAA rated tranches have become smaller in the standard CLO 2.0 structure, most other debt tranches are now larger than they were pre-crisis. The combined effect of smaller AAAs, larger AAs, and mezzanine (A/BBB/BB) tranches and a larger equity cushion is that over-

collateralization levels¹ for all debt tranches are greater than they were pre-crisis. This is a direct result of revisions to the CLO tranche rating methodologies used by S&P and Moody's, which require greater credit protection than they did pre-crisis to secure the desired credit rating. Another consequence of the agencies' revised methodologies is that they are less synchronized, and will often return a slightly different rating given the same set of assumptions. For this reason, it has become common for an issuer to have its AAA tranche rated by both agencies (as is typically required by AAA investors), while the remaining tranches are rated by just one agency to avoid the complexity of split-rated tranches (in the sample CLO 2.0 structure in Figure 3, mezzanine tranches are rated by S&P but not by Moody's).

Clarity and Conformity in Collateral

Similar trends have taken hold on the opposite side of the CLO balance sheet, as pre-crisis diversity has been replaced by a more standardized, and generally more restrictive, set of norms for the construction of CLO collateral portfolios. The rules for collateral are spelled out in CLO indentures, and generally fall into three categories: eligibility criteria, concentration limits, and aggregate quality tests.

Eligibility criteria are fairly straightforward and include prohibitions against purchasing defaulted obligations, credit risk obligations (loans that have been downgraded or placed on negative watch by a ratings agency), or equity securities. Another criterion, which has always been present but tends to have fewer loopholes under the CLO 2.0 regime, is the requirement that collateral must have a maturity date prior to the legal final maturity of the CLO itself, to prevent exposure to market risk in the event that collateral would need to be sold when a CLO is unwound at maturity.

Concentration limits are much more extensive in scope, and have become more consistent and more restrictive during the post-crisis period. A typical battery of CLO 2.0 collateral restrictions appears in Figure 4.

FIGURE 4
Typical CLO 2.0 Collateral Portfolio Concentration Limits

Collateral Type	% of Total Collateral	
First-lien Senior Loans	>=	90.0
Mezzanine/Unsecured Loans or Bonds	<=	10.0
CCC Rated Obligations	<=	7.5
Participations	<=	20.0
Structured Finance Securities	=	0.0
Synthetic Securities	=	0.0
Fixed Rate Obligations	<=	7.5
Any Single Obligor	<=	2.0
Any Single Industry	<=	10.0
Covenant-Lite Loans	<=	50.0
Obligors Domiciled in the U.S.	>=	80.0
DIP Loans	<=	7.5
Revolvers/Delay Draw Obligations	<=	10.0
Loans with Original Size < \$150mn	=	0.0

Source: Barclays Research

¹ Overcollateralization is the amount by which available collateral exceeds the notional amount of the debt tranche in question along with all debt tranches that are senior to the tranche in question. Theoretically, it represents the percentage of the collateral pool that could be removed due to credit loss before the principal of the tranche in question would become impaired. See the Appendix for an example of this calculation.

Several of the above requirements are more restrictive than their pre-crisis counterparts. In particular, pre-crisis CLOs often had a lower threshold for first-lien senior secured loans and a higher limit on fixed rate obligations, allowing managers to hold more high yield bonds in their collateral pools. Bonds' lower recoveries in events of corporate default have exacerbated losses for some older vintage CLOs with very large bond buckets, leading to much stricter limits in the 2.0 regime. In addition, most post-crisis CLOs are expressly prohibited from holding structure finance or synthetic securities of any kind, in stark contrast to pre-crisis deals which often held other CLO tranches in their collateral pools. While pre-crisis CLOs did not suffer excessive default losses as a result of having structured product or synthetics in their collateral pools (unlike, for example, CDOs containing subprime mortgage bonds), the elimination of nested CLO exposure in the 2.0 structure simplifies the modelling and portfolio evaluation processes, to the benefit of tranche investors.

Another notable addition to CLO 2.0 concentration limits is the presence of covenant-light² (cov-lite) loan buckets, which were undefined in pre-crisis deals. For the first wave of post-crisis CLOs, limits were typically 40-50%, trending higher over the past nine months as cov-lite issuance has become the norm in the leveraged loan market. While this development is viewed by some investors as a potential threat to recoveries during the next default cycle, research by Moody's³ suggests that pre-crisis cov-lite loans performed as well as or better than full covenant loans in the aftermath of the financial crisis, as long as the issuer had an adequate cushion of unsecured or subordinated debt behind the first-lien loan.

In addition to concentration limits, CLO indentures specify several portfolio-level quality tests that must be passed to ensure that the aggregate credit risk remains within desired limits. The quality tests listed in Figure 5 have become more standardized for post-crisis CLOs, and reflect some changes in underlying assumptions brought about by the experience of the financial crisis. As such, thresholds for spreads tend to be higher, recoveries slightly lower, and average life expectations somewhat shorter. Maximum ratings factors (which move inversely to credit quality) tend to be more uniform these days, while lower diversity score thresholds reflect today's smaller (on average) portfolios.

FIGURE 5
Pre- and Post-Crisis CLO Collateral Quality Test Limits

Collateral Quality Test ⁴	CLO 1.0 (Pre-2008)	CLO 2.0 (2010 to Present)
Minimum Weighted Average Spread (WAS)	2.5-3.5%	4.0-4.5%
Minimum Weighted Average Recovery Rate (WARR)	45-50%	43-45%
Maximum Weighted Average Ratings Factor (WARF)	2500-3200	2700-2800
Maximum Weighted Average Life (WAL)	10 yrs	8 yrs
Minimum Diversity Score (DS)	55-75	45-60

Source: Barclays Research

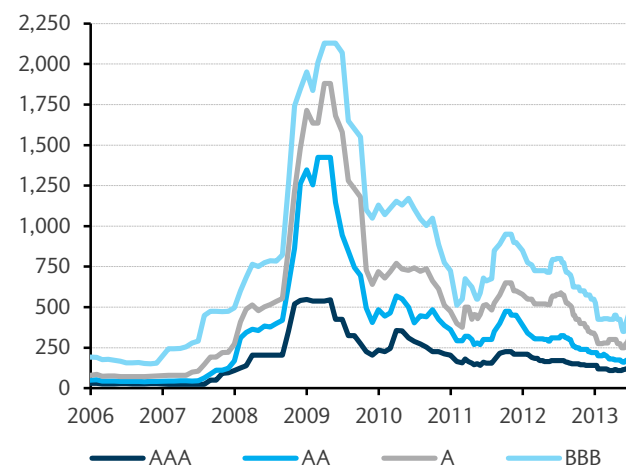
² Covenant-light loans typically do not have financial maintenance covenants, including leverage and coverage tests. Under a full covenant package loan, the issuer would be required to pass these tests each quarter, while a cov-lite issuer would only be required to pass such tests to execute additional borrowing (i.e., incurrence tests).

³ See Moody's "Covenant-Lite Defaults and Recoveries – Seeing Where it Hurts," June 7, 2011, for details.

⁴ See the Appendix for more detail regarding quality test definitions.

FIGURE 6

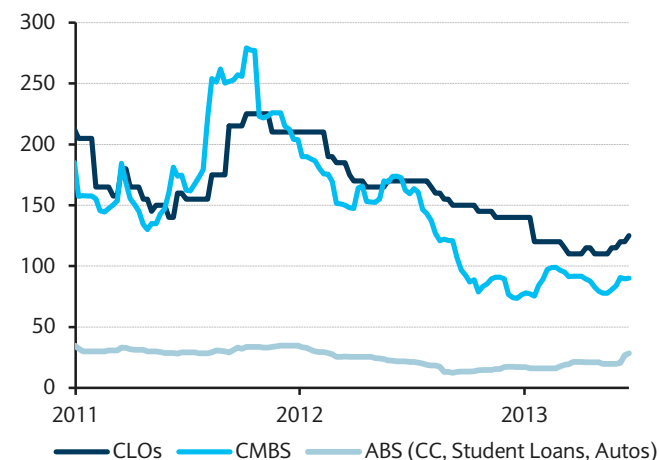
Average CLO Tranche Spreads by Quality



Source: Barclays Research

FIGURE 7

Structured AAA Spreads



Source: Barclays Research

Wider Spreads and an Evolving Buyer Base

Despite credit enhancing changes in the standard structure and (mostly) stricter limits regarding collateral portfolios, CLO spreads remain well wide of pre-crisis levels across the entire quality spectrum (Figure 6). CLO tranches also tend to trade wide of similarly rated bonds from other structured products, including CMBS and various types of ABS (Figure 7), despite suffering significantly lower credit losses during the downturn (particularly relative to CMBS). Part of the challenge for CLO tranches is that they suffer from some technical disadvantages relative to other structured products. As we first highlighted in *The AAA League, December 14, 2012*, real money demand for CLOs is somewhat hampered by the fact that their comparative illiquidity makes them ineligible for inclusion in the Barclays U.S. Aggregate Index. Most CMBS and ABS bonds are in this index, providing benchmarked investors with an incentive to own them, in contrast to CLOs which represent an off-index investment. In addition, the relative lack of available financing for CLO tranches in the post-crisis environment has reduced demand from hedge funds, for whom the unleveraged returns from higher-rated tranches are hardly compelling.

Beyond these technicals, however, lies a more fundamental cause for persistently higher CLO spreads despite the enhanced safety of the standard 2.0 structure. Namely, as Figure 8

FIGURE 8

Investor Base Evolution by Tranche Rating

Tranche Rating	Pre-Crisis	Post Crisis / Early Recovery	CLO 2.0
AAA	Banks, pension funds, structured investment vehicles (SIV)	Banks, pension funds, insurers and asset managers	Banks, pension funds, insurers and asset managers
AA / A	Banks, insurers, asset managers	Insurers and asset managers, hedge funds	Banks, pension funds, insurers and asset managers
BBB / BB	Asset managers, prop desks, regional banks	Hedge funds	Asset managers, CLO funds, hedge funds
Equity	CLO managers, hedge funds	Hedge funds	CLO managers, CLO funds, hedge funds

Source: Barclays Research

shows, the buyer base for various CLO tranches has changed over time, with some types of pre-crisis buyers likely to remain absent for the foreseeable future. In particular, the structured investment vehicles (SIVs) that relied on short-term wholesale funding and significant leverage to finance portfolios of long-dated, relatively illiquid AAA tranches with narrow credit spreads are probably gone forever. So too are most of the Wall Street prop desks that supported demand for the mezzanine part of the capital structure. Meanwhile, a new FDIC insurance assessment rule has shown signs of crimping U.S. bank demand for AAAs (detailed further in the upcoming section on regulatory changes).

As these buyers have exited, others have stepped forward to take their place, but not always for the long haul or in equal strength. In the immediate aftermath of the crisis, hedge funds stepped into the breach, providing liquidity across the capital stack as other investors retrenched. However, as CLO 2.0 liabilities repeatedly set new post-crisis tights in 1H 13, hedge funds have migrated down the capital structure to focus primarily on lower-rated mezzanine and equity tranches which still offer sufficient unleveraged return prospects to be appealing to total return investors. Meanwhile, the higher-rated, lower-yielding tranches have moved into the hands of more stable real money accounts. More recently, a new investor base has emerged, as private equity, institutions, and business development companies (BDCs) have allocated money to asset managers with structured finance expertise, creating CLO investment funds. Similar to other hedge funds, these participants tend to focus on the higher-yielding parts of the CLO capital structure.

CLO Performance: History, Drivers, and Competing Interests

Historical Performance Proves the Model

By design, CLOs have built-in safeguards that protect the integrity of the structure and the cash flows of senior tranche holders, at the expense of subordinated and (potentially) mezzanine notes. These safeguards include:

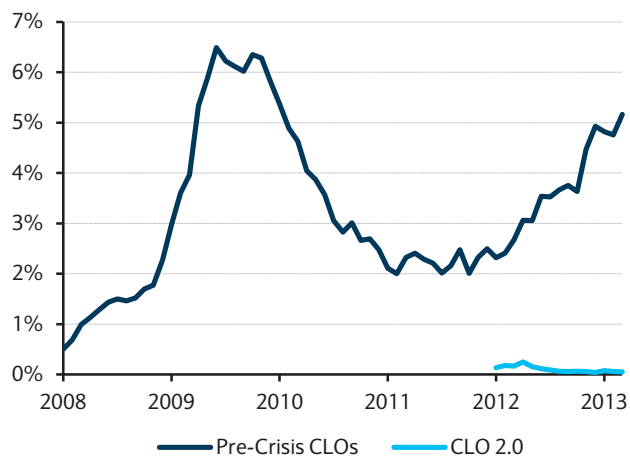
- Overcollateralization tests, which ensure that cash flows are diverted from subordinated noteholders and paid to senior noteholders if the collateral pool erodes beyond a minimum acceptable level.
- Interest coverage tests, which also divert cash flows from subordinated to senior noteholders if collateral cash flows do not cover a CLO's scheduled interest payments with a sufficient margin of safety.
- Restricted trading conditions, which can prevent managers from reinvesting collateral principal repayments if the CLO's senior tranche, has been downgraded from its original AAA rating. Cash flows are instead diverted to pay down senior noteholders.
- Principal balance adjustments that, under certain conditions, lower the size of the collateral pool for the purpose of overcollateralization tests, making it more likely that cash flows will be diverted to senior noteholders. In particular, discount obligations (collateral purchased significantly below par) and excess CCC rated obligations (beyond the specified portfolio limit) are counted at market value rather than par.
- Events of default, which under certain (fairly extreme) conditions can result in acceleration of senior CLO tranches which become immediately payable in full.

The common thread running through all of these safeguards is that cash flows are diverted from junior noteholders to pay down the most senior liability in the CLOs capital structure, until the test in question is passed, or the adverse condition cured. This has the effect of shrinking and deleveraging the structure while raising the average cost of capital, to the

detriment of the CLO manager (whose management fee income falls as total asset size decreases) and equity holders.

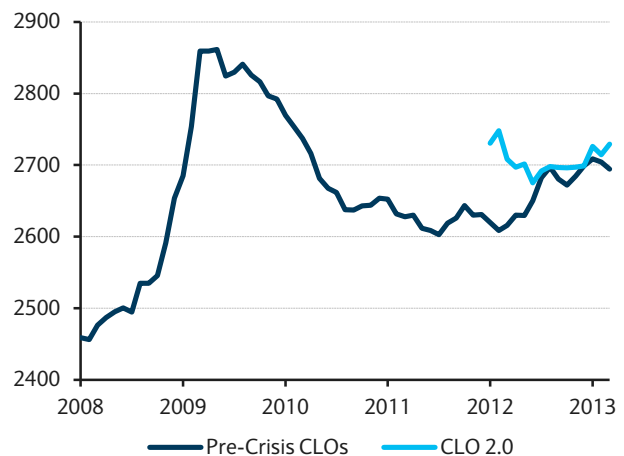
The net benefits of these structural features are apparent in pre-crisis CLO performance. Initially, a wave of collateral defaults followed the 2008 financial crisis and recession, peaking in late 2009 (Figure 9) before rapidly falling back to barely 2% by the end of 2010 (the recent rise is driven by filings from long-troubled issuers, most recently Dex One and SuperMedia, rather than a renewed deterioration in broader credit quality). As the financial performance of leveraged borrowers deteriorated, ratings agencies issued numerous downgrades, causing the weighted average ratings factor (WARF) to increase significantly (Figure 10). The wave of rating agency downgrades pushed average CCC buckets to nearly 12% (Figure 11), well in excess of levels that would have triggered principal balance adjustments to reflect the excess CCC share. This, in turn, negatively affected senior overcollateralization levels, which in many cases fell below test thresholds, causing cash flows to be diverted to pay down senior noteholders. Many CLO liability tranches were also downgraded by the agencies after their rating methodologies were revised, triggering restricted trading conditions that placed further constraints on the use of collateral cash flows.

FIGURE 9
U.S. CLO Trailing 12-Month Collateral Default Rates



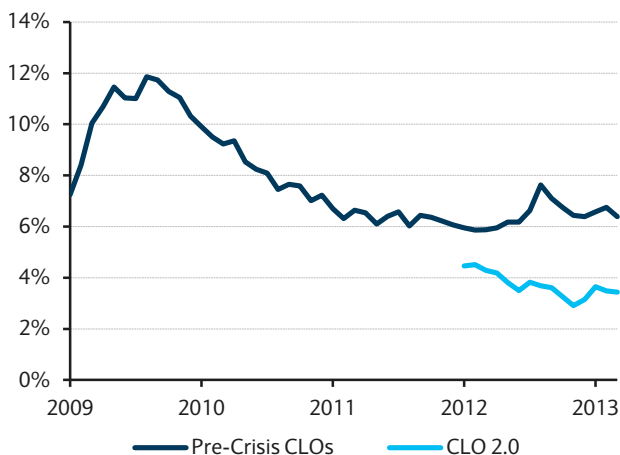
Source: Moody's Investor Services

FIGURE 10
U.S. CLO Weighted Average Ratings Factor (WARF)



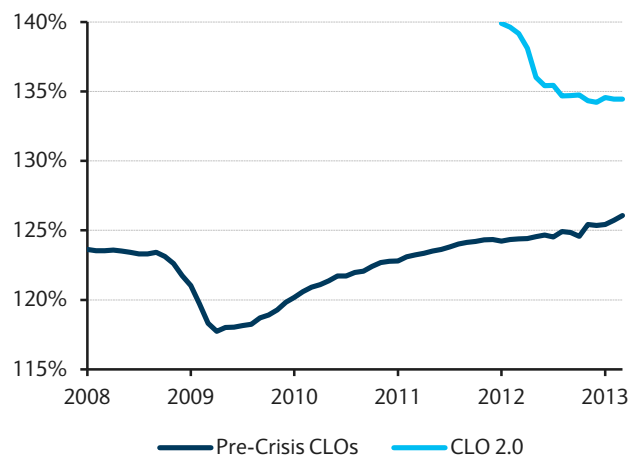
Source: Moody's Investor Services

FIGURE 11
Share of U.S. CLO Collateral Rated CCC+/Caa1 or Lower



Source: Moody's Investor Services

FIGURE 12
U.S. CLO Average Senior Over-Collateralization Level



Source: Moody's Investor Services

Over time, however, a combination of gradual economic recovery and the proper functioning of CLO safeguards resulted in a broad improvement in CLO quality and performance. After falling significantly in the wake of the credit crisis, CLO senior overcollateralization levels staged a multi-year recovery, eventually rising above pre-crisis levels as many deals began deleveraging (Figure 12). Along the way, Moody's lifted the punitive macro risk factor adjustment that was added to its rating methodology in the wake of the crisis, resulting in multi-notch ratings upgrades for hundreds of previously downgraded CLO tranches (see "Leveraged Loans & CLOs" in *U.S. Credit Alpha*, June 24, 2011, for details on this methodology change). The subsequent improvement in collateral performance and the ongoing deleveraging of pre-crisis deals have combined to drive further positive tranche ratings momentum (Figure 13), to the point that the overwhelming majority of pre-crisis CLO tranches have returned to their original credit ratings, and no AAA or AA rated tranche has yet suffered a credit loss. Equity performance has predictably been mixed, but some managers were able to sustain regular equity distributions through the downturn. Returns to equity holders were especially strong from 2010 to 2012, driven by a locked-in (pre-crisis) cheap capital structure and wider (post-crisis) collateral spreads.

FIGURE 13
U.S. CLO Moody's Rating Migration Matrix: 1Q12 to 1Q13

		Moody's Rating: 1Q13							
		Aaa	Aa	A	Baa	Ba	B	Caa	Ca/C
Moody's Rating: 1Q12	Aaa	99.4%	0.6%	-	-	-	-	-	-
	Aa	27.1%	72.6%	0.2%	-	-	-	-	-
	A	6.1%	23.0%	69.7%	1.1%	-	-	-	-
	Baa	1.3%	2.7%	24.6%	71.0%	0.5%	-	-	-
	Ba	0.1%	0.1%	1.7%	14.1%	82.9%	1.1%	-	-
	B	-	-	-	0.4%	20.3%	78.5%	0.8%	-
	Caa	-	-	-	-	1.4%	11.2%	85.9%	1.4%
Key:		Upgraded in the past year							
		Unchanged in the past year							
		Downgraded in the past year							

Source: Moody's Investor Services

Value Drivers – Using (Somewhat) Static Variables in a (Very) Cyclical World

With pre-crisis CLOs back on firmer footing following a broad-based multi-year rally, and CLO 2.0 structures safer from the outset, CLO investors have been able to return to relative value analysis, for which the primary tool is cash flow modelling. It is immediately intuitive that this type of analysis is required to value equity tranches, as their residual claim on collateral cash flows makes the timing and size of any payments inherently uncertain. However, this uncertainty also extends to the timing of principal repayment for CLO liability tranches, and this timing affects the rate at which any premium or discount to par is ultimately amortized. For this reason, liability tranche valuations can be profoundly affected by modelling assumptions, particularly when prices deviate materially from par, as they often have in the post-crisis era.

Modern cash flow modelling software has reached an extremely high level of sophistication, allowing investors to create numerous scenarios with multi-layered assumptions. However, market conventions have grown up around a few key assumptions that are often cited in conjunction with price quotes and discount margins. The first such assumption is the constant default rate (CDR), which is intended to reflect the default risk of the underlying

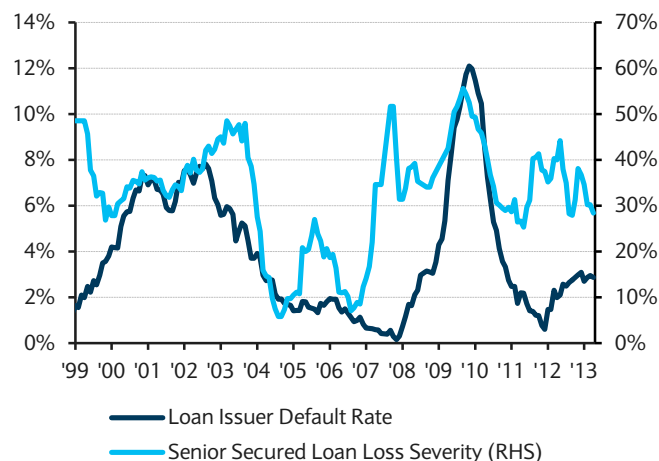
leveraged loans that make up the overwhelming majority of CLO collateral pools. CDR assumptions primarily affect modelled equity IRRs, as the high average recovery of leveraged loans necessitates much higher default rates before liability tranches are affected. The most common assumptions are 2% (near the long-run median for leveraged loan issuers) and 0% (unrealistic but useful as a baseline). In practice, default rates are anything but constant, instead demonstrating significant counter-cyclical variation (i.e., they are highest when economic conditions are at their worst).

A second (and related) assumption is the loss severity given default. First-lien loans are the most senior obligations in an issuer's capital structure, and have the first claim on company assets in a bankruptcy or other restructuring. As such, market participants commonly assume 30-40% loss severity in the event of default, which is the reciprocal of an assumed 60-70% recovery rate. Similar to CDR, loss severity assumptions primarily affect equity IRRs. Similar to default rates, historical loss severity rates vary counter-cyclically, as average recoveries decline when defaults are higher (Figure 14). When two highly correlated, counter-cyclical variables are modelled with constant assumptions, the potential for serious errors in cash flow estimation and security valuation is introduced.

A third variable present in all CLO cash flow models is the constant prepayment rate (CPR) assumption, which is necessary because the timing of collateral principal repayment is uncertain. Leveraged loan issuers almost always refinance significantly in advance of maturity, to ensure adequate market access. After a CLO's reinvestment period is over (typically four years after issuance for standard 2.0 structures), collateral prepayment speed affects the rate at which a CLO amortizes. Equity holders in a performing CLO are likely to prefer slower prepayments to delay deleveraging and an increase in WACC, while discounted liability tranches can benefit from faster prepayments driving pull to par. Faster prepayments will also shorten the weighted average life (WAL) of all tranches, starting with the most senior, often providing a rolldown benefit.

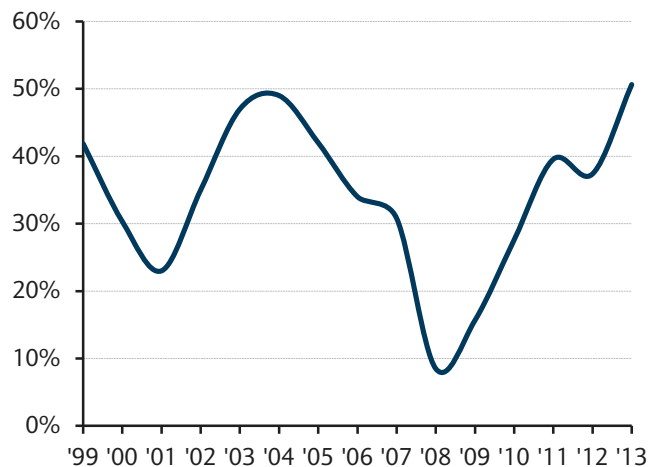
The most common prepayment rate assumption is 20% per year, but historical rates average closer to 35% and vary pro-cyclically, opposite to default and loss severity rates (Figure 15). This pro-cyclicality results in negative convexity to equity holders after reinvestment ends, as their cost of capital will rise more quickly when market conditions improve as cheaper liability tranches are paid down. It is for this reason that many CLOs are

FIGURE 14
LTM Loan Issuer Default and Loss Severity Rates



Source: Moody's Investor Services

FIGURE 15
LSTA Leveraged Loan Index Repayment Rates (% of Total Par Paid Down by Year)



Source: S&P LCD

called by equity holders well in advance of their final maturity, after the economics of the deal no longer support the credit risk inherent in bearing first-loss exposure.

Co-opetition – Investor Interests and Manager Incentives

The CLO manager is responsible for the portfolio selection, monitoring, and trading throughout the life of the CLO, with the objective of maximizing returns to the CLO investors through asset selection, test compliance, and minimization of defaults. While this may seem like a relatively straightforward task (subject to the inherent challenges involved in credit selection), the manager's role varies considerably over the life of a CLO. Moreover, a manager's incentives are not aligned equally with all tranche holders, which can create conflicts of interest that have on occasion led to contentious outcomes. The three principal phases through which a manager must guide a CLO are:

- *Ramp-up:* The manager must assemble the initial collateral pool that will provide the cash flows to service the debt and equity tranches. The most efficient way to achieve this is through the primary market, where original issue discounts (OIDs) allow managers to acquire loans at less than face value. Prior to the 2008 financial crisis, banks provided financing which allowed the manager to acquire loans several months ahead of the actual CLO issuance. Such a funding facility is called a 'warehouse'. Fewer CLO warehouses have been available to 2.0 issuers, often forcing managers to seed their portfolio by refinancing a portion of a legacy deal, or by ramping up aggressively after the CLO's securities are issued.
- *Reinvestment:* During the reinvestment period (typically four years for 2.0 deals, although pre-crisis periods were longer), the manager reinvests scheduled and early loan principal repayments, as well as any recovery proceeds from defaulted assets. Such reinvestments are subject to compliance with the aforementioned eligibility criteria, concentration limits, and collateral quality tests. Subject to these hurdles, manager latitude is at its peak during this period.
- *Post-reinvestment:* The portfolio manager's role becomes much more restricted at the end of the reinvestment period as most collateral principal proceeds are directed to pay down the CLO's liabilities. In some pre-crisis CLOs, vague indenture language allowed managers to reinvest early principal repayments, particularly in amend-to-extend transactions. However, CLO 2.0 language tends to more specifically disallow this practice, restricting manager latitude and making CLO durations more predictable.

For his or her role in the CLO transaction, the portfolio manager receives management fees paid through the deal's cash flow waterfall. These are generally split between senior fees (typically 20bp) that are senior to all other cash flows except administrative and trustee expenses, junior fees (typically 30bp) that are senior only to equity note holder distributions, and incentive fees that are typically 20% of all equity distributions after the equity note holders have achieved a minimum hurdle rate of return (typically a 15% IRR).

While the CLO manager's responsibilities and objectives vary over time, CLO investor interests can vary significantly, depending on which tranche they hold. Figure 16 summarizes the basic priorities and concerns facing tranche investors across the quality spectrum.

FIGURE 16

Typical CLO Investor Interests by Tranche Quality

Tranche Quality	Investor Priorities	Investor Concerns
AAA	Absolute safety of principal	Reinvestment risk due to uncertainty regarding timing of principal repayment
	Predictability of amortization speed	Strength of indenture language limiting manager latitude after reinvestment period
	Secondary market liquidity	Manager track record for principal repayment following reinvestment period end
AA / A	Safety of principal	Reinvestment risk due to uncertainty regarding timing of principal repayment
	Predictability of amortization speed	Strength of indenture language limiting manager latitude after reinvestment period
	Secondary market liquidity	Manager track record for principal repayment following reinvestment period end
BBB / BB	Credit loss avoidance	Collateral portfolio composition
	Acceleration of discount amortization	Manager track record for uninterrupted payments to all liability tranche holders
	Secondary market liquidity	Manager risk retention
Equity	Credit loss avoidance	Collateral portfolio composition
	Residual cash flow maximization	Manager track record for maintaining equity distributions
	Maintaining leverage and low WACC	Manager risk retention

Source: Barclays Research

Since the risk of credit loss is extremely remote for senior (AAA) and high mezzanine (AA/A) investors, their primary concern is the reinvestment risk that is inherent in the uncertain timeframe over which they will receive their investment principal repayment. In this regard, CPR assumptions can significantly affect higher-rated tranche valuations, and realized collateral repayment rates often drive the resulting tranche performance. As such, investors in these tranches are less likely to focus on the composition of the collateral portfolio, and more likely to be concerned about any vagueness in the indenture language that could allow the manager to avoid paying down liability tranches after the reinvestment period ends.

Conversely, credit risk is very much real for lower-rated mezzanine and equity tranche holders. As such, both investor types are keen to minimize collateral defaults, and may base their valuation assessments, in part, on the actual composition of a CLO's collateral pool. For managers with legacy deals outstanding, performance through the crisis is likely to be heavily scrutinized. Moreover, holders of riskier tranches are likely to consider whether the manager has retained any of these tranches themselves. But despite having these concerns in common, lower mezzanine and equity holders may hold very different views on prepayment speeds. As previously mentioned, equity holders in a performing deal typically prefer slower prepayments to delay deleveraging and maintain a low cost of capital, but lower mezzanine tranches are almost always issued at a significant price discount to par, meaning that faster prepayments can lead to an acceleration of the discount amortization.

Amid these competing concerns sits the manager, who must balance the needs of all investors despite uneven (at best) or even misaligned (at worst) incentives. On average, managers hold a much larger share of CLO equity than they do of higher-rated CLO liabilities, and must also clear an equity internal rate of return (IRR) hurdle to earn incentive fees. This clearly aligns near-term manager incentives with equity holders. However, repeat issuance over the long term (and the associated increase in AUM and manager fees) requires a track record of stability and credibility with liability tranche investors, particularly with large AAA holders that can help anchor a new deal.

Regulation: Consequences? Yes; As Intended? Unclear

Despite the encouraging performance of CLOs during and after the 2008 financial crisis and recession, they have not escaped the increased regulatory scrutiny that has spread across much of the financial landscape. For U.S. CLO investors, there are three primary regulatory streams that have the potential to materially affect CLO creation now and in the future. In chronological order, they are the FDIC insurance assessment rule change (enacted and effective as of April 1, 2013), the U.S. Foreign Account Tax Compliance Act (enacted in 2010, proposed regulations issued in February 2012, applies to interest payments beginning in January 2014), and section 941b of the Wall Street Reform and Consumer Protection Act (colloquially Dodd-Frank, enacted in July 2010, final regulations not yet published, with implementation to follow finalization by two years).

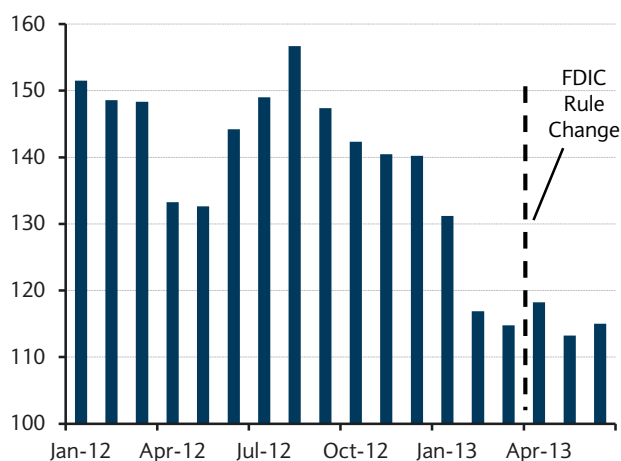
FDIC Insurance Assessment Rule Change

For all CLOs issued after April 1, 2013, the FDIC has raised U.S. banks' insurance assessment rate on "higher risk" assets. The FDIC's definition of higher risk includes any CLO tranches backed by at least 50% collateral that has 3-4x senior/total leverage. The majority of leveraged loans fall into this leverage category, so all CLO tranches issued after April 1 should be affected by the rule change. CLOs issued prior to that date are grandfathered, including CLOs that are within their reinvestment period and are still purchasing new "higher risk" collateral.

The exact implications of the change will vary from bank to bank based on the overall riskiness of each bank's portfolio. The assessment rate is capped and floored, so banks at the extremes of the risk spectrum may not see any change in their rate due to CLO purchases. However, most banks are expected to be within the range where each new CLO purchase increases the overall riskiness of the bank's asset portfolio for purposes of the assessment rate calculation. While the precise calculation is complex, two principles are important to understand. First, any change in assessment rate from a marginal purchase of a higher risk asset applies to the bank's entire asset portfolio, not just to the margin purchase, essentially leveraging the effect. Second, the higher assessment rate applies regardless of tranche rating, making the rate change more punitive as a percent of spread earned for higher-rated tranches, particularly AAAs. Since U.S. banks have historically focused on AAA rated tranches, this rule change could alter CLO equity return prospects by raising the weighted average cost of capital.

FIGURE 17

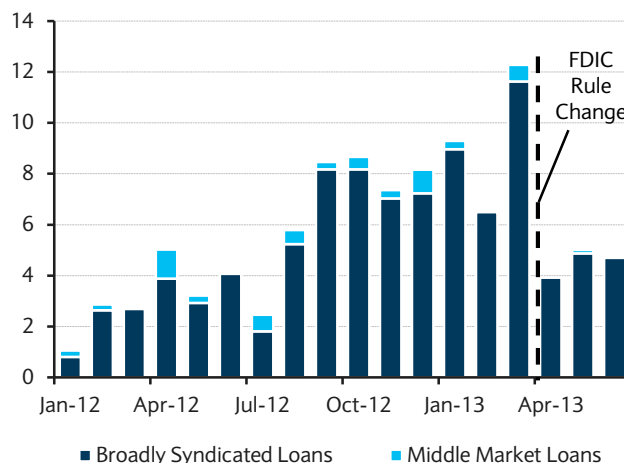
U.S. CLO Average New Issue AAA Spread (bp)



Source: Intex, Creditflux, S&P LCD, Barclays Research

FIGURE 18

Monthly U.S. CLO Issuance (\$bn)



Source: Intex, Creditflux, S&P LCD, Barclays Research

With nearly three months gone by since the rule's implementation, we can begin to assess its effect empirically. In the immediate aftermath of the April 1 effective date, new issue AAA spreads did indeed move wider despite an ongoing rally in other risk assets (Figure 17), which seemed to indicate that the rule had created a negative demand technical at the top of the CLO capital stack. However, AAAs rallied to new post-crisis tightness in May, before widening back out amid a general market weakness in June, suggesting that the effect of the change on spread levels may be somewhat muted. What has not yet recovered are CLO issuance volumes, which remain well below the ~\$8bn per month run rate that prevailed during 4Q12 and 1Q13. Clearly, some CLO issuance was pulled forward into March, and volumes had begun picking up steam before June's volatility, but to date it appears that the CLO new issue market may still be feeling some modest residual effects of this rule change.

U.S. Foreign Account Tax Compliance Act (FATCA)

Enacted under the Hiring Incentives to Restore Employment Act in March 2010, FATCA is intended to close loopholes by which U.S. investors can avoid paying taxes to the IRS on income earned through Foreign Financial Institutions (FFIs). It requires FFIs to report information to the IRS about their investors and imposes a 30% withholding requirement for all non-compliant payees. Most CLOs are legally incorporated in the Cayman Islands, and, as such, are considered FFIs for the purpose of FATCA applicability. This means that CLOs are required to provide information to the IRS on their debt and equity tranche holders, or withhold 30% of interest payments beginning in January 2014 and 30% of principal repayments beginning in January 2017.

The legal requirements associated with FATCA compliance create numerous issues for CLOs. First, their debt and equity tranches can be freely traded in the secondary market, meaning that a CLO manager may have no idea who holds them at any given time. The cost of tracking and reporting this information is likely to be daunting for many CLO issuers that do not have extensive legal and administrative resources. Second, legacy CLO indentures have no provision allowing the manager to report this information, while FATCA's withholding requirements would violate the terms of the indenture's cash flow waterfall, to which the manager is required to conform.

Market participants, spearheaded by the LSTA, have been actively engaged with the IRS in an attempt to craft a solution that will allow the CLO market to avoid being unnecessarily negatively affected by FATCA, which was never intended to place impossible-to-meet burdens on CLO managers. The most promising proposal involves the negotiation of intergovernmental agreements (IGAs) between the IRS and foreign jurisdictions in which FATCA compliance violates the home country's own privacy and data protection laws (the Cayman Islands is one such jurisdiction). FFIs complying with the relevant home country IGA would be deemed FATCA-compliant as well, and would not be subject to withholding requirements.

Dodd-Frank Section 941b: Risk Retention and the Consolidation Drive

One of the many assumptions underlying the Wall Street Reform and Consumer Protection Act is the notion that forcing securitizers to have a vested interest will prevent unscrupulous operators from taking advantage of their allegedly naïve clients. In an effort to reduce the potential conflicts of interest associated with an originate-to-distribute model, section 941b of the law focuses on risk retention as a potential solution. While the final regulations associated with this rule have not yet been agreed upon and published, the general idea is for someone (in principle the original lender, which could be interpreted to mean the arranger, the manager, or even an outside sponsor) to retain 5% of the unhedged credit risk exposure for the life of the transaction. This could be accomplished by retaining a horizontal slice of the equity tranche, a pro-rata vertical slice of the entire capital structure, or an L-shaped combination of the two. Certain classes of investors, almost certainly to include banks and other large financial institutions, would be prohibited from investing in non-

compliant CLOs. The loss of major classes of investors and the resulting loss of liquidity would likely make non-compliant issuance untenable.

With final regulations not yet clear, forecasting the eventual effect of the Dodd-Frank 941b implementation is difficult. However, the experience of European CLO issuers is potentially instructive, as article 122a of the EU Capital Requirements Directive (recently superseded by CRD IV's Risk Retention Requirements) imposes the same 5% retention rule and is already in effect for new European CLOs. Currently, only EU-based financial institutions are restricted from investing in non-122a compliant CLOs, whereas insurers, pension funds, hedge funds, and non-European banks are all able to invest if they so choose. The spectre of lower liquidity for non-compliant deals initially led to the practice of third-party sponsoring, wherein an equity investor would agree to buy and retain a 5% risk position for the life of the deal. However, CRD IV narrowed the definition of sponsor to mean a credit institution or investment firm, essentially zeroing in on the CLO manager.

If the outcome in Europe proves to be predictive for the U.S., risk retention is likely to ultimately fall upon the CLO manager here as well. Based on the trend in manager consolidation during the post-crisis period, it appears that the market is already expecting this outcome. Given a typical deal size of \$400-500mn, a 5% retention requirement would mean allocating \$20-25mn in balance sheet for each new CLO brought to market, a figure that is most likely beyond the capacity of some smaller managers. When combined with the potentially increased administrative burden associated with FATCA and other regulatory compliance, risk retention makes a powerful argument for economies of scale. Top managers have grown through a combination of new issuance and acquisitions, with industry leaders such as Carlyle, Blackstone/GSO, Ares, and Apollo all acquiring multiple managers and billions in total notional during the post-crisis period. While the top 20 managers (Figure 19) now account for nearly two-thirds of total notional, the fact that 33 other managers have just one or two deals outstanding suggests that additional consolidation is to come.

FIGURE 19

Top 20 U.S. CLO Managers by Total Assets

Rank	Manager	AUM (\$bn)	# of Deals
1	Highland Capital Management	14.0	20
2	Apollo Global Management	13.7	22
3	Ares Management	13.6	33
4	CIFC	12.1	33
5	Blackstone/GSO Capital Partners	12.0	29
6	Carlyle Group	10.6	23
7	Credit Suisse Asset Management	10.4	26
8	Babson Capital Management	7.6	19
9	ING Investment Management	6.9	15
10	KKR Financial Advisors	6.9	7
11	Fortress Investment Group	6.9	8
12	CVC Credit Partners	6.7	19
13	MJX Asset Management	6.3	12
14	Prudential Financial	5.8	12
15	Columbia Management	5.4	10
16	Symphony Asset Management	5.2	11
17	Invesco	4.9	16
18	PineBridge Investments	4.7	13
19	Black Diamond Capital Management	4.6	11
20	Alcentra	4.5	15

Note: as of March 31, 2013. Source: Creditflux

Appendix – Definition of Terms and Acronyms

Over-Collateralization (O/C)

The over-collateralization ratio represents the degree to which available collateral exceeds the notional amount of a CLO liability tranche, along with all liability tranches that are senior to the tranche in question. Theoretically, it represents the percentage of the collateral pool that could be removed due to credit loss before the principal of the tranche in question would become impaired. Examples of the calculation are as follows:

- 1) Senior notes:
$$\frac{[\text{Collateral Notional}]}{[\text{Senior Notes Notional}]}$$
- 2) Mezzanine notes:
$$\frac{[\text{Collateral Notional}]}{[\text{Senior} + \text{Mezzanine Notes Notional}]}$$

Under some circumstances, some of the collateral in the numerator may be counted at market value rather than par. Examples include excess CCC holdings beyond the prescribed collateral limit, as well as loans that are purchased at a significant discount to par (discount obligations).

Over-collateralization tests specify minimum thresholds for these ratios. If the calculated ratio falls below the threshold, the test fails. In that event, all cash flows owed to more junior noteholders are diverted to pay down the principal balance of senior liabilities until the over-collateralization ratio once again exceeds the threshold.

Interest Coverage (I/C)

The interest coverage ratio represents the degree to which cash flows produced by the collateral portfolio exceed the interest owed to CLO liability tranche holders, along with all liability tranches that are senior to the tranche in question. Theoretically, it represents the percentage of collateral interest cash flow that could be removed before insufficient proceeds would be available to pay the full amount of interest due the tranche in question. Examples of the calculation are as follows:

- 1) Senior notes:
$$\frac{[\text{Collateral Interest Proceeds}]}{[\text{Senior Notes Interest Due}]}$$
- 2) Mezzanine notes:
$$\frac{[\text{Collateral Interest Proceeds}]}{[\text{Senior} + \text{Mezzanine Interest Due}]}$$

Interest coverage tests specify minimum thresholds for these ratios. If the calculated ratio falls below the threshold, the test fails. In that event, all cash flows owed to more junior noteholders are diverted to pay down the principal balance of senior liabilities until the interest coverage ratio once again exceeds the threshold.

Weighted Average Spread (WAS)

WAS is the par-weighted average nominal coupon spread from the CLO's collateral pool, inclusive of any benefit from Libor floors. Minimum WAS thresholds are intended to ensure that the CLO's collateral produces sufficient cash flow to pay interest due to liability tranche holders.

Weighted Average Recovery Rate (WARR)

WARR is the par-weighted average projected recovery rate for the CLO's collateral pool, as estimated by S&P or Moody's (differences in rating agency methodologies can produce different recovery estimates for the same issuer). Minimum WARR thresholds are intended to ensure that the CLO's collateral portfolio would not suffer inordinately high credit losses in the event of a material increase in default rates (for example, during a recession).

Weighted Average Ratings Factor (WARF)

WARF is the par-weighted average ratings factor, based on the Moody's facility rating for each loan in the collateral pool. Ratings factors increase as credit quality (and published credit ratings) decrease, per schedule in Figure 20.

FIGURE 20

Moody's Credit Ratings and Rating Factors

Moody's Rating	Rating Factor
Ba1	940
Ba2	1,350
Ba3	1,766
B1	2,220
B2	2,720
B3	3,490
Caa1	4,770
Caa2	6,500
Caa3	8,070
Ca-C	10,000

Source: Moody's Investor Services

Maximum WARF thresholds are intended to ensure that the CLO manager does not assemble an overly risky collateral portfolio in an effort to boost cash flow distributions to equity holders.

Weighted Average Life (WAL)

WAL is the par-weighted average remaining life of the collateral portfolio. It takes into account any scheduled principal repayments prior to final maturity, but does not assume any voluntary prepayments. Maximum WAL thresholds ensure that adequate principal repayments will be available in the collateral pool to pay down CLO liability tranche holders in full prior to the final maturity of the CLO.

Diversity Score (DS)

DS represents the equivalent number of completely non-correlated assets for a portfolio with assets that are assumed to be correlated to some degree. Minimum DS thresholds ensure that an adequate level of economic and geographic diversification is maintained in the collateral portfolio, so that the collateral pool's default rate does not escalate more quickly than expected in the event of a material increase in default rates (for example, during a recession).

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