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# CLO Mythbusters: Fact-Checking the Headlines

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Since 2008, Bloomberg, the Financial Times, and even Hollywood have provided the general public with myriad causes of the Great Financial Crisis (GFC), rarely failing to include a layman's introduction to CDOs and how they played a major role.

More recently, this conversation has grown to include comparisons to today's CLO and leveraged loan markets, with premonitions of another GFC brewing just a decade after the last, with CLOs acting as an accelerant. We present the facts for investors to use as a guide when planning for the next downturn, instead of relying on media rhetoric.

- **CLOs are not like other CDOs.** The results speak for themselves – per Moody's, the 10-year cumulative impairment rate of global CLO tranches originally-rated AAA is 0.0%, while for global CDOs (ex-CLOs) it is 43.0%.
- **CDO lessons learned.** From the CDO-era, we learned to avoid mark-to-market vehicles, to know the underlying assets, minimize correlations, and understand the buyer base.
- **CLO structures have evolved.** Post-crisis CLO deals tend to have less structural leverage, shorter reinvestment periods, more restrictions on asset holdings, and greater focus on matching asset cash flows to liabilities.
- **CLOs are not forced sellers.** CLOs are non mark-to-market vehicles that have an incentive to hold assets over the long term, rather than be forced to sell at the lows. We identify two theoretical sources of forced selling: defaulted CLO liquidations are extremely rare, and the CLO warehouse market is small in comparison to the outstanding CLO market.
- **CLOs are semi-forced buyers.** Asset quality in CLOs is falling as a result of a decrease in overall loan fundamentals, creating problems for CLO managers that continue to issue deals to satisfy investor demand and trade their portfolios while keeping quality test limits in line.
- **Loan funds have created more volatility.** In the US specifically, loan funds and ETFs could be increasing volatility in loan market prices – another reason to focus less on market value statistics on underlying CLO pools and more on a manager's ability to take advantage of the volatility to build par.
- **Rating agencies remain active, but difficult to forecast.** Rating agencies appear to be active in monitoring and appropriately rating tranches based on their reconfigured methodologies. While rating agencies have experience in "getting it right" with regard to projecting losses on the underlying assets, the inability to forecast when they actually downgrade the assets requires CLO managers to be prepared for such an event.
- **CLO investors need a strategy.** Despite myriad reasons that CLOs will not be forced sellers of loans, we recognize that secondary CLO tranche prices are likely to experience heightened volatility in the next downturn, with more CLO mezz tranches potentially taking some loss.

## "CLOs Are the Next CDOs"

Rarely a day goes by when CDOs of yesteryear are not compared to today's CLOs. While the two acronyms look similar, the differences that are relevant for investors are significant.

### CLOs versus CDOs

The term CDO actually covers an array of structured vehicles backed by debt, whether that debt is leveraged loans (CLOs), high yield bonds (CBOs), or even other structured products (CDO squared). So while CDO subsets may have somewhat comparable structures (an SPV issues debt tranches, AAA through equity, and buys assets), the performance of the underlying assets *and* the ability of the vehicles' liabilities to match the cash flows generated by those assets have proved vital for the future performance prospects of structured products.

The results speak for themselves – per Moody's, the 10-year cumulative impairment rate of global CLO tranches originally rated AAA is 0.0% and just 5.6% for BB tranches. Global CDOs (ex-CLOs) tell a different story, with an impairment rate of 43.0% for AAA tranches and 62.4% for BB tranches.[1] Even compared to corporate defaults, CLOs have still shown lower impairment rates from AAA (0.0% versus 0.1%) through BB tranches (5.6% versus 15.3%).

FIGURE 1

**CLO Impairment Rate Comparison**

| Original Rating | US | Euro | Global | Global CDOs (ex-CLOs) | Global Corp. Defaults* |
|---|---|---|---|---|---|
| AAA | 0.0% | 0.0% | 0.0% | 43.0% | 0.1% |
| AA | 0.0% | 0.0% | 0.0% | 53.1% | 0.7% |
| A | 0.1% | 0.0% | 0.1% | 58.6% | 2.1% |
| BBB | 3.0% | 0.4% | 2.4% | 65.2% | 3.4% |
| BB | 6.0% | 5.0% | 5.6% | 62.4% | 15.3% |

Source: Moody's *Global corporate default rate data based from 1983 to 2018.

Lessons from the CDO era include, but are not limited to:

- **Avoid mark-to-market vehicles.** A mix of high embedded leverage and market-value triggers caused cascading effects as underlying assets, especially other securitized products, quickly fell in value.
- **Know the underlying assets.** CDOs backed by other CDOs and synthetic securities made it not only tricky to price the pool on a regular basis, but also extremely difficult to understand how overlap, defaults, prepayments, and recoveries could affect ultimate tranche recoveries.
- **Minimize correlations.** Subprime mortgages were directly exposed to housing prices – a fall in home prices led to a decline in mortgage pool performance. Linking a portfolio with significant exposure to a single factor makes it more difficult to hedge performance of the underlying assets, even when headline diversity is relatively high, and significantly dilutes the ability of different tranches to create differing risk profiles.
- **Understand the buyer base.** CDOs, SIVs, and asset-backed commercial paper created an artificial demand for securitized products like other CDOs (including CLOs) that arguably mispriced market risk because of the revolving nature of issuance and the leveraged buyer base.

[1] *Impairment and Loss Rates of Structured Finance Securities: 1993-2017* (Moody's), June 25, 2018

## CLOs: Before and After

Today, there are no market value triggers in CLOs, and tranches, specifically senior rated notes, are typically held by longer-term, unleveraged capital investors such as banks, insurers, and money managers. In addition, the collateral (most of which is priced on a daily basis) comprises primarily first-lien leveraged loans and some high yield bonds in European deals, with prohibitions against owning other CLO tranches and synthetic securities.

Despite the alarming name, leveraged loans are issued by common-name companies such as CenturyLink, American Airlines, Ziggo, and Altice. The loans are typically broadly syndicated (BSL), rated BB/B, floating rate (based on LIbor/Euribor), have a soft-call period of 6-12 months, maturity of around seven years (~four-year WAL), and facility size of about half a billion.

US CLOs currently own about 60% of the performing US loan market, while European CLOs own just under half of the European loan market since they also buy high yield bonds. This represents a big change from the late 1990s, when banks owned about half of the loan market. Other holders of US loans include mutual funds (15-18%), hedge funds/SMAs (14-18%), and a smaller percentage by BDCs (business development companies), insurers, and banks.

Furthermore, the structures of CLOs themselves were re-configured after the crisis to fit enhanced rating agency methodologies and comply with new regulations (eg. the Volcker Rule). As a result, post-crisis CLOs tend to have less structural leverage (more credit enhancement (C/E)), shorter reinvestment periods (time to trade the portfolio), more restrictions on asset holdings (no structured finance assets), and greater focus on matching asset cash flows to liabilities (limits on currency differences, floating versus fixed holdings, assets maturing after CLO liabilities mature). For more details, please refer to our *US CLO Market Mini-Primer* (June 28, 2013) and *European CLO Primer* (September 2, 2015).

FIGURE 2

**CLO Comparison: 1.0 versus 2.0 Average Structures**

| | 1.0 US | 2.0 US | 1.0 Euro | 2.0 Euro |
|---|---|---|---|---|
| AAA C/E | 28% | 36% | 30% | 38% |
| AA C/E | 21% | 25% | 23% | 29% |
| A C/E | 15% | 20% | 17% | 22% |
| BBB C/E | 11% | 14% | 11% | 16% |
| BB C/E | 8% | 9% | 7% | 10% |
| CLO Leverage (Debt/Equity) | 12.0x | 10.0x | 10.0x | 9.5x |
| Wtd. Avg. Cost of Capital | 45-75bp | 150-225bp | 45-75bp | 160-215bp |
| Reinv. Period | 6-7 yrs | 4-5 yrs | 5-6 yrs | 4-5 yrs |
| Non-call Period | 3-4 yrs | 2 yrs | 3-4 yrs | 2 yrs |
| CCC/Caa Bucket | 7.5% | 7.5% | 5-7.5% | 7.5% |
| Pmt. Frequency | Qtrly | Qtrly | Semi | Qtrly |

Source: Intex, Barclays Research

One of the most noticeable changes is the increase in credit enhancement by rating. In both US and European CLOs, what was once considered a BBB rated tranche would be considered a BB tranche today, based on credit enhancement levels. This additional credit enhancement will likely help counter the declining fundamentals in the loan market, where we expect lower recoveries.

**Takeaway:** CLOs are a far-derived relative of other pre-crisis CDOs, and the structure has been tested and proven to work as intended through the cycle. Post-crisis CLO structures are more conservative with regard to enhancement levels and asset limitations. However, like all investments, there are always complexities that require constant monitoring.

## "CLOs Are Forced Sellers AND Buyers"

Since the GFC, investors and media alike have attempted to pinpoint the likely tipping point for the next crisis. Just like the decline in housing prices and inability to refinance multiple mortgages, some people believe that CLOs, now a global market at an estimated $750bn in size, will have their hands forced when loan prices decline.

### CLOs Are Almost Never Forced Sellers

During the GFC, some CDOs, SIVs, and even a few CLOs with market-value triggers became forced sellers when asset prices quickly fell. After the crisis, these structures generally fell away to the more proven idea that CLOs should be non mark-to-market vehicles that have incentive to hold assets over the long term, rather than be forced to sell at the lows.

Thus for a 2.0 deal, if a loan falls in price, is downgraded to CCC, or even defaults, a CLO is not forced to sell. Because CLOs do not have market-value triggers, a par-based overcollateralization (OC) test (adjusted asset balance/debt balance) is used to haircut the par balance of some of the riskier assets and protect investors from too much par erosion or prevent a concentration in lower-quality, lower-priced assets – specifically, CCC assets (typically above 7.5%), defaulted assets (held at lower of recovery or market value), and loans purchased at a significant discount to par (held at purchase price).

If an OC test fails (the lowest test typically being on the BB rated tranche), cash flows from coupons and repayments are diverted from the equity tranche and are used to pay down the most senior notes until the test is back in compliance. Because CLO managers want to generate respectable equity returns and keep management fees flowing, they have an incentive not to trip an OC test, or at least to cure it as soon as possible. We show an example of what it may take to even get to this situation in Figure 3.

FIGURE 3

**CCC Downgrades – The Effects on OC Cushion**

| **Assumptions** | | |
|---|---|---|
| Downgrade Rate from B to <CCC | 15.0% | |
| CCC Market Price | 50% | |
| CCC/Caa Excess Limit | 7.5% | |
| Lowest OC Test Trigger | 103.8% | |
| Orig. CLO Asset Balance | 541 | |
| Orig. CLO Debt Balance | 500 | |
| **Current 2.0 Averages** | **U.S. BSL** | **Euro** |
| Lowest OC Test Cushion | 4.4% | 4.4% |
| CCC/Caa Bucket | 3.5% | 1.6% |
| B+/B/B- Exposure | 65.0% | 63.0% |
| **Downgrade Effects** | | |
| CCC/Caa after Downgrades | 13.25% | 11.05% |
| Excess CCC/Caa Bucket | 5.75% | 3.55% |
| **The Math** | | |
| CLO Assets (Ex-CCC/Caa Excess) | 509.9 | 521.8 |
| CLO Assets (CCC/Caa Excess Haircut) | 15.6 | 9.6 |
| New CLO Asset Balance | 525.4 | 531.4 |
| New Lowest OC Test | 105.1% | 106.3% |
| Lowest OC Cushion Change | -3.1% | -1.9% |
| **New Lowest OC Test Cushion** | **1.3%** | **2.5%** |

Source: Intex, Barclays Research

Even when we assume a level of loan downgrades and CCC prices similar to those during the GFC (holding all else equal), CLOs still have 100-250bp of cushion on their lowest OC tests. When CCC buckets surpass about15% in our example, though, OC tests begin to trip. Outside of diverting cash flows until the notes deleverage enough to cure the test, CLO managers can also sell CCC assets to get the test back in compliance, but there is no requirement.

Because the excess CCC bucket uses the assets with the *lowest* market value, CLO managers who have a bullish fundamental view on the lowest-priced CCC credits can preserve *more* par by selling the higher-priced CCCs to get tests back in compliance. While this strategy may not be used by every manager, it goes to show the number of tools available to CLO managers to express their longer-term fundamental views, even when price dislocations arise.

### *CLO Events of Default*

In a more extreme downside scenario, CLOs could *technically* become forced sellers should they trip an event of default (EOD). However, only a handful of deals have experienced such an event, likely because of the high requirements, which can include missed interest on AAA/AA tranches, non-payment of principal at maturity (12-13 year maturity), a senior OC ratio that falls below 102.5%, or issuer insolvency.

To trigger an EOD in a CLO, we think it would take a long, drawn-out process for the CLO to see such a level of underperformance. For example, Harbourmaster CLO 3, one of the few deals to hit EOD, was a Euro CLO issued in 2002 and by maturity in 2014 was unable to pay off all the notes in full, requiring the single-A tranches to take an approximately 50% haircut. This deal also allowed the manager to buy up to 20% of investment grade-rated ABS, per Fitch. These types of baskets were a risk in the few deals that experienced an EOD in the past that does not exist today.

To give some perspective on the senior 102.5% OC trigger, the initial portfolio par value (*not market value*) for a new deal would need to decline more than 30%. As mentioned above, the par-based OC tests hold most assets at par, but will haircut certain riskier asset buckets. Using our assumptions from Figure 3 and ignoring all the structural protections afforded to investors, downgrading 100% of B-rated assets to CCC tomorrow and holding them at 50% would still leave 100-200bp of senior OC test cushion for a new issue deal.

In the rare event that an EOD occurs, though, the reinvestment period terminates and the controlling class (most senior tranches outstanding) can declare the notes immediately due and payable. If all the CLO debt can be paid back in full, the trustee can direct the collateral to be liquidated and pay down the tranches. The senior note holders could also waive the default, providing a way for this scenario to not technically create forced selling.

### *CLO Warehouses*

When loan prices fall sharply, talk also tends to focus on an even less well-understood aspect of CLOs – warehouse facilities. Traditionally, CLO warehouses have been provided by investment banks to allow CLO managers more time to accumulate a portfolio of assets (eg, “ramping”) for a future CLO, with typical pricing about six months after warehouse launch. While CLO warehouses are generally half as leveraged as priced CLOs, the shorter reinvestment period, bank balance sheet usage, and limited information on the amount of warehouses outstanding often leave investors with more questions.

In a sense, though, warehouses are just like standard CLOs, except smaller, shorter, and less complicated. There is a senior lender (arranging bank) that provides a majority of the warehouse funding amount (70-80%) and a subordinated lender (the CLO manager or third-party source) that holds the first loss piece (15-25%). Warehouses generally have a 6-12 month reinvestment period, followed by a 12-month amortization period (two-year total life), and tend to have portfolio tests and asset restrictions similar to priced CLOs.

Even though CLOs are non-mark-to-market vehicles, most warehouses hold assets at market value when determining whether more funds can be lent to the manager to buy additional assets (eg, drawstop event) and if the amortization period begins prematurely.

However, only in a minority of outstanding warehouses are there actual market-value triggers that will cause the warehouse to default and technically be forced to liquidate. Similar to senior notes in priced CLOs, senior lenders are well insulated from losses, and negotiations to sell the pool through an auction process or even hold the pool of loans on the arranger's balance sheet can keep assets from being liquidated at low prices.

Finally, the size of CLO warehouses outstanding, while variable, is typically only a small percentage of the outstanding priced CLO universe. Using a back-of-the-envelope estimate, assuming that warehouses are about half the size of priced CLOs, about 45% ramped, and that most active managers from last year have at least one open warehouse, with larger managers having two to three, we estimate $20-25bn in open warehouses globally, only about 2-3% of the global CLO outstanding market.

### Retail Loan Funds – The More Likely Forced Sellers

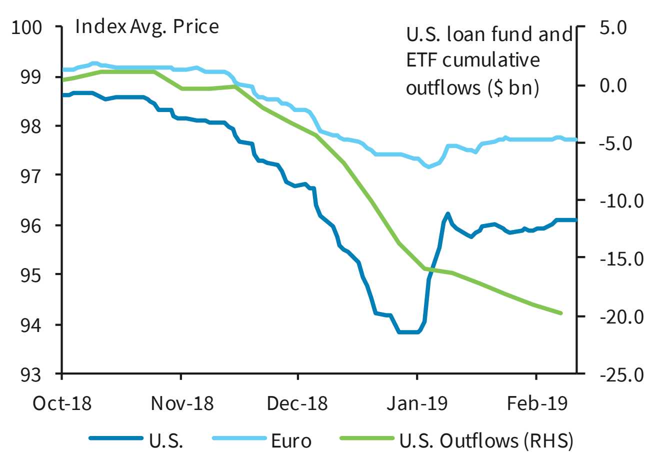
An area of the loan market that has received more interest lately is the growth of open-ended funds and their effect on market technicals. Per Moody's, US loan funds and ETFs were only about 5% of the institutional loan market in 2007. In our annual demand study, we estimated that they currently represent closer to 15%. These funds have increasingly allowed average investors to take part in the popular floating-rate asset class, but loan price volatility has also increased as funds buy or sell to meet redemptions or net subscriptions. Hedge funds, money managers, and insurers may also be driven to sell because of redemptions or finding relative value elsewhere.

The latest example of retail-induced volatility was in 4Q18, when loan fund redemptions in the US accelerated in light of the more dovish Fed. Despite the low number of troubled loan credits, the US loan index fell below 94, while the Euro loan index move was more subdued, declining only to around 97. The divergence was likely due to the different buyer base – CLOs and loan funds make up a larger percentage of the loan market in the US, while retail funds make up a smaller percentage of the European loan market.

One of the biggest takeaways from this and past downturns is that market value metrics such as market value OC (MVOC) and market value equity net asset value (underlying assets - CLO

FIGURE 4

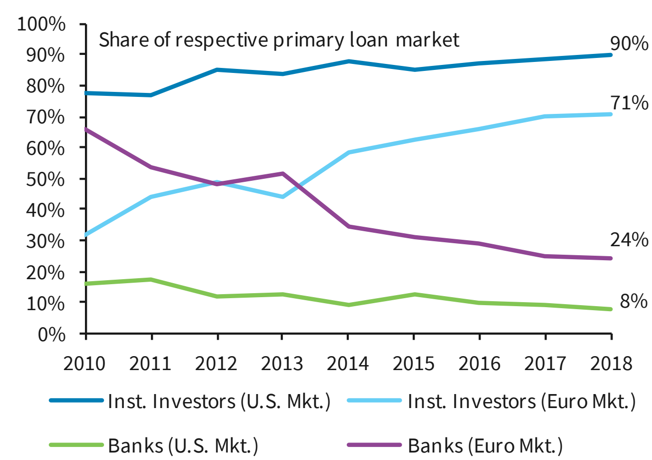
**Loan Fund Outflows Pressured Loan Prices**




Source: S&P LCD, Barclays Research

FIGURE 5

**CLOs and Loan Funds Are a Larger Percentage of US Primary Market**




Source: S&P LCD, Barclays Research

debt), while useful for pricing mezz and equity in the secondary market, can be less useful for determining any possibility of a CLO default or forced selling. In any downturn, we think long-term investors should focus more on whether managers are doing what they are paid to do – manage the portfolio with the goal of maintaining or building par.

## CLOs Can Sometimes Be Forced Buyers

Outside the typical late-cycle behavior seen in larger and more leveraged transactions, a significant driver of the decline in loan market ratings is the sheer demand for floating-rate paper from CLOs, SMAs, and other loan funds that have seen continued inflows over the past few years. As loan spreads have tightened, loan investors have been forced to move lower in the ratings stack to make up the decline in returns.

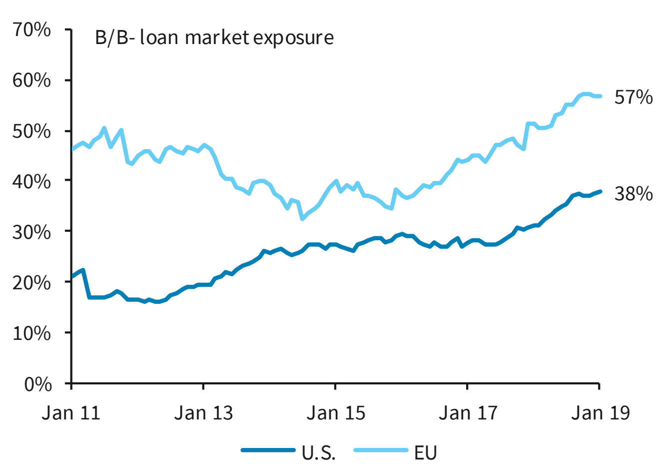
This, in addition to the increased flexibility of loan covenant structures, has also encouraged issuers from the high yield market to issue in the loan market. The US performing loan market is now approximately $1trn (+19% in 2018), while the European loan market is EUR180bn (up 30% in 2018) – both growing at the expense of the high yield (ex-financials) markets, which were flat (Euro) to down 5% (US) in 2018.

Despite the growth in the CLO market, CLO managers can only purchase assets in compliance with what the structure allows. During the reinvestment period, managers are "guided" by tests to ensure that asset quality does not become too concentrated or excessively risky. Collateral quality tests (CQTs) include minimum or maximum limitations on average spread (WAS), coupon (WAC), ratings (WARF), diversification (diversity score), recovery ratings (WARR), and maturity (WAL). Portfolio quality tests (PQTs) can include restrictions on assets that can be purchased – for example, a minimum level of first-lien loans, maximum industry concentration, and others. In many cases, if a CLO is failing a quality test, the manager can trade only to maintain or improve the failing test, in an attempt to steer the portfolio back into guidance.

Even with these asset restrictions, CLOs still have to purchase assets. In 2018, US and European CLOs purchased roughly 61% and 43% of their respective primary loan market volume, compared with 34% and 17% in 2010. As loan market fundamentals have deteriorated and loan market ratings have decreased (record B/B- exposure), the average CLO asset rating factor (WARF) has increased (lower ratings equal higher rating factors).

FIGURE 6

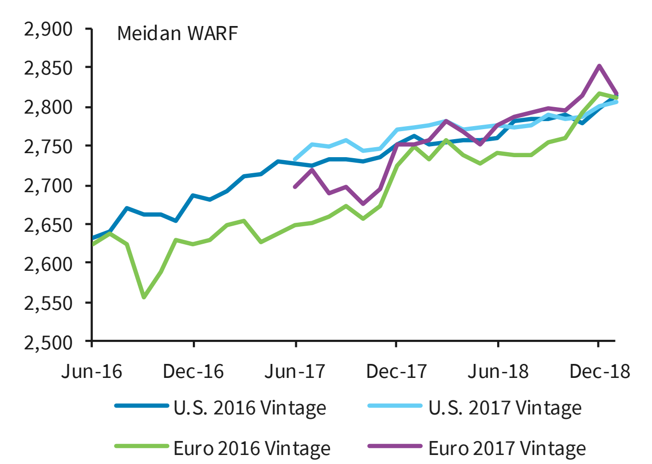
**Loan Market Ratings Continue to Decline**




Source: S&P LCD, Barclays Research

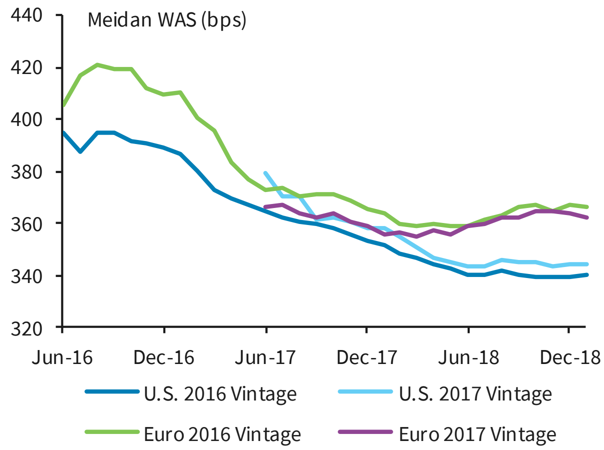
FIGURE 7

**As a Result, CLO WARFs Are Increasing**



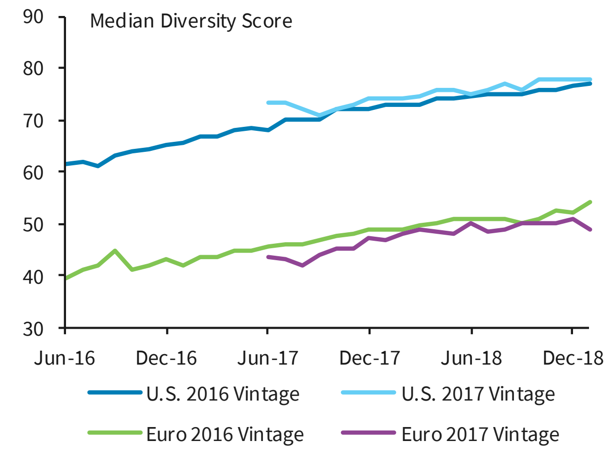

Source: Kanerai, Intex, Barclays Research

FIGURE 8
**CLO Asset Spreads Have Been Pressured…**




Source: Kanerai, Intex, Barclays Research

FIGURE 9
**…Which Has Pushed Managers to Increase Diversity Scores**




Source: Kanerai, Intex, Barclays Research

When trading the portfolio, most deals require the manager to "maintain or improve" any failing quality tests. For example, if a CLO has more than 7.5% of CCC assets, generally, the manager can trade the portfolio only if the test maintains the same value or improves. In addition, the manager has to abide by a "matrix" of asset quality tests with similar trading restrictions to ensure that the portfolio balances the risk (WARF) with appropriate spread (WAS) and diversity (diversity score).

The latest reaction by managers to avoid such a limited trading scenario is to increase the diversity scores of their asset pools, although there is a limit as to how much longer this can continue. Regardless, we think that more CLO managers will be in a position where they are "restricted" in trading the portfolio over time as they run into some of the constraints mentioned above when the cycle begins to turn.

**Takeaway:** While CLOs are not technically forced sellers or buyers of loans, the data still show that asset quality is deteriorating as a result of a decrease in overall loan fundamentals. While the probability of CLO defaults and forced selling is still extremely low, CLO managers are likely to continue experiencing issues in trading their portfolios with regard to quality test limits. Some of the lower quality in the market is because CLOs have been forced to buy lower-quality loans as AUM grew and spreads tightened.

In addition, loan funds and ETFs in the US could be increasing volatility in loan market prices – another reason to focus less on market-value stats on underlying CLO pools and more on a manager's ability to take advantage of the volatility to build par.

## "Rating Agencies Are Asleep at the Wheel"

Fingers were pointed at the rating agencies following the GFC; despite providing corporate ratings for several decades, the agencies were likely less experienced with rating subprime mortgage deals and other structured finance products.

Despite the low impairment rate, CLOs experienced a whirlwind of rating actions during and after the GFC as the rating agencies placed additional stresses on tranches and reworked methodologies. More than half of US and European CLO AAA tranches were downgraded two to three notches in 2009 and 2010, before most were upgraded back to AAA just a few years later.

As ratings have tended to lag, investors worry that CLO tranches could be misrated again come a downturn. However, we think that enhanced methodologies, greater subordination, and common deal stipulations have created more protections for investors.

## CLO Downgrades

Following the GFC, rating agencies reworked their structured product rating methodologies, which now require more conservative capital structures to achieve rating stacks similar to those before the crisis (eg, 2.0 BB C/E = 1.0 BBB C/E). We reviewed recent ratings actions to see if the rating agencies are active in monitoring deals and if the methodology has worked as intended as deals age and some collateral deteriorates.

In 2018, we count 43 individual tranche downgrade events across US and European CLOs. A majority of those have been on US BSL mezz tranches, with four tranches (all originally rated BB or single-B) already downgraded in 2019.

It appears that most of the CLO tranche downgrades have occurred because the deals' excess spreads (asset spread minus CLO cost of capital) have declined since issuance. Since the credit enhancement for BB and single-B tranches is already quite low relative to senior tranches, the rating agencies (particularly Moody's) appear to place more emphasis on excess spread for these lower-rated tranches. Should asset spreads decline further, more mezz tranches, especially those that show par losses, could be susceptible to downgrades.

While there have been relatively few Euro CLO tranche downgrades so far, we have seen rating agencies take a stance with regard to initial credit enhancement in new Euro CLOs.

Down the stack, more European CLO tranches are given a negative rating (eg, BBB-), as average credit enhancement levels have declined roughly 50bp for a BB/B tranche to 200bp for a BBB tranche since 2015. Because rating agency methodologies were reconfigured to rate to expected loss or first-dollar loss, it makes sense that as that credit enchantment declines, initial ratings will continue to fall.

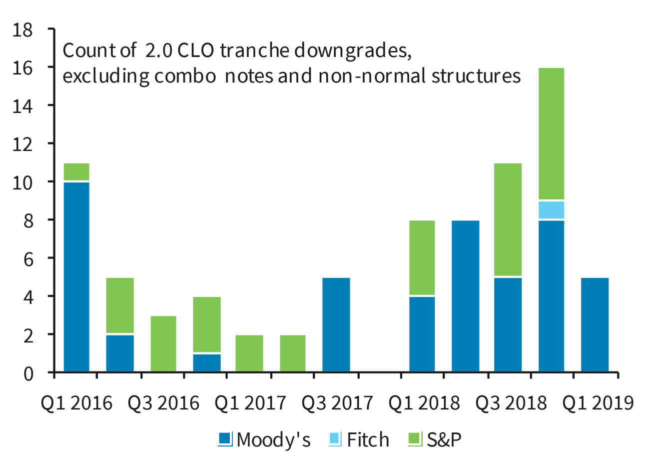
Should CLO tranche downgrades continue and move up the stack, a true "restricted trading" condition could also arise. The event typically arises when the most senior tranche is downgraded by one or more notches, or if the AA through BB tranches are downgraded by two or more notches. While there are caveats to supersede this rule and it is similar to when one of the quality tests is failing, it still gives managers incentive to avoid such an event since it can be even more difficult to cure.

## Loan Ratings

Ratings on the actual loans can be just as important to CLO investors, since there are ratings-based tests within the CLO structure. Because short-term price movements in assets matter less for CLOs, investors tend to focus on monitoring troubled credits or industries that could be downgraded.

FIGURE 10

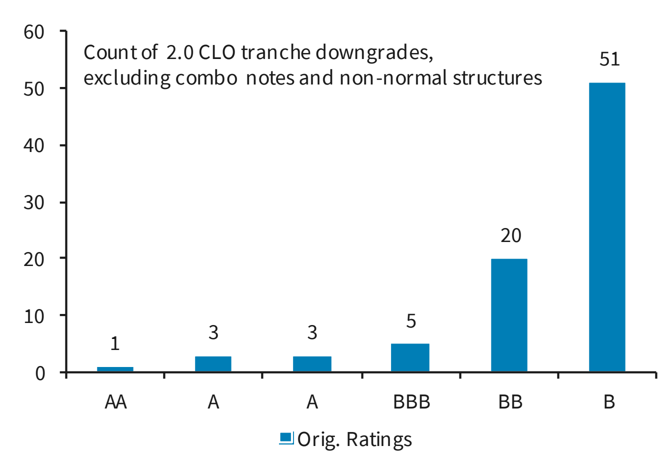
**CLO Tranche Downgrades Continue to Increase**




Source: Bloomberg, Fitch, Moody's, S&P, Barclays Research

FIGURE 11

**Majority of Downgrades Are Originally Rated BB or Single-B**




Source: Bloomberg, Fitch, Moody's, S&P, Barclays Research

Even without a downgrade, CCC and WARF tests could still be pressured. For example, some CLOs have a provision where if an asset is placed on negative outlook by a rating agency, the asset's rating will be treated as having been downgraded one notch in the WARF calculation (Moody's asset rating) or CCC bucket (S&P asset rating). Similarly, a negative watch is treated as a two-notch downgrade. While an asset default can actually improve these metrics (WARF and CCC assets typically exclude defaults), the asset would then have to be held at the lower of market or recovery value.

The biggest concern to investors, though, is not that these stipulations exist, but that they are extremely difficult to model. While the rating agencies have shown that they can accurately predict ultimate losses on the underlying assets,[2,3] each agency has its own specific methodology to rate corporate credits, which includes a qualitative element.

Thus, unexpected jumps from single-name downgrades or industries being placed on downgrade watch could quickly put a CLO offside on quality tests. Thus, CLOs that are tight on WARF tests, have high B3/CCC exposure, or are concentrated in a relatively weaker performing industry could be most at a risk of a significant rating event.

**Takeaway:** Rating agencies appear to be active in monitoring and appropriately rating CLO tranches based on their reconfigured methodologies. As asset ratings decline, though, a big unknown comes from future asset downgrades. While rating agencies have experience in "getting it right" with regard to projecting losses, the inability to forecast when they actually downgrade the assets requires managers to be prepared for such an event.

[2] *Leveraged Finance: A 10-Year Lookback At Actual Recoveries and Recovery Ratings* (S&P), February 4, 2019.
[3] *Loss given default assessments remain on target* (Moody's), February 5, 2019.

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