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North America

Global Structured Credit Strategy

Value in AAA and Euro BBB

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- **US AAAs continue to look cheap** — For all the robust credit performance and strength of CLO triple-As, the assets continue to trade cheap to its structured and corporate peers; we recommend more funds and banks look at them.

- **More bank involvement in senior bonds** — Our analysis shows banks are getting increasingly involved in CLO senior bonds for higher return on capital, and as an investment opportunity for the amount of liquidity that QE3 is likely to generate.

- **Seasoned bonds are rapidly amortizing** — A shorter duration and possible capital gains for discount bonds makes us recommend the CLO 1.0 triple-As. Loan repayment rates are running much higher than many investors' assumptions

- **Euro triple-Bs attractive despite new loss data** — European speculative-grade default rates are climbing but recoveries have surprised to the upside. At forecast default and recovery rates, Euro CLO mezz is tempting as a recovery play.

- **Buy Euro triple-Bs with turbo-BBs into cheapness** — Some investors prefer triple-Bs in deals without turbo-BBs for fear that turbos release cash early; our analysis of a mezz portfolio shows that the relative underperformance is marginal.

- **Issuance crosses $30 billion** — With the entry of more CLO buyers, issuance is now well past double all of 2011 issuance. We note, September had the highest monthly volume and the last quarter the busiest one since the financial crisis.

- **Spreads tighten but still cheap to 2011** — Spreads have rallied across the board with triple-As lagging the rally somewhat and greater convergence between CLO 1.0 and CLO 2.0.

See Appendix A-1 for Analyst Certification, Important Disclosures and non-US research analyst disclosures.

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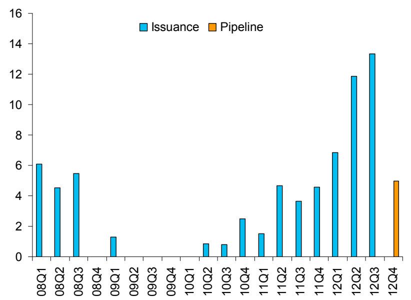
CLO Market Snapshot – Volume and Spreads

Figure 1. US CLO Issuance, $bn

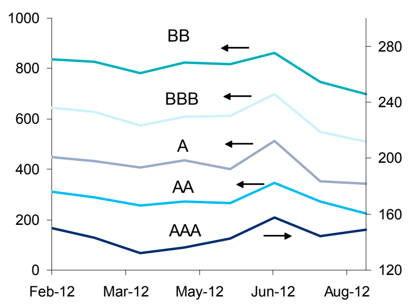


Source: Citi Research

Issuance more than double all of 2011

With the entry of more buyers into the CLO markets (see our 'Bank Involvement will Continue' section), CLO issuance is now well past double all of 2011 issuance. In fact, September had the highest monthly volume and the last quarter the busiest quarter (Figure 1) since the financial crisis in 2008. Our thesis that a relative lack of loan supply and tighter loan spreads would be bad for CLO supply has not proven right. New issue spreads have tightened helping projected equity returns, highlighting the well-known lag between underlying and CLO spreads. Several managers such as Prudential, CSAM, LCM, ING and Och-Ziff have already done more than one deal (a handful did three) this year, and we have also seen a few small, new managers such as Valcour and KVK benefit from the strong demand for the CLO product. Total issuance, including some middle-market deals, will exceed $35bn for the year.

Figure 2. US CLO new issue spreads, bps

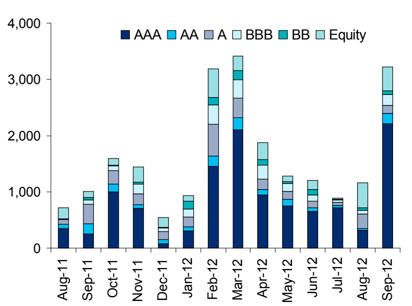


Source: Citi Research

Debt spreads help in US and Europe

Though new issue spreads have tightened, there should be room to tighten further. Many investors are still apprehensive about mark-to-market leverage after the financial crisis, and the structural leverage of mezz and junior notes within a CLO structure has proven to be very attractive. What has lagged the rally in liability spreads are the triple-As (Figure 2) which is why we think there is relative value in this part of the capital structure (see the next section). Down the capital stack, mezzanine bonds bought at discount (see the last Global Structured Credit Strategy) offer an attractive combination of carry and convexity – that is, upside if deals are called plus reduced losses because of low-dollar purchase prices. And while Europe is nowhere close to a primary deal in the weeks ahead, the secondary market there has seen a substantial rally. The prospects for a European deal in the next few months are looking all the more likely as a result. Discount spreads for triple-As in the Euro CLO secondary market from deals that are still reinvesting (and thus akin to a hypothetical new issue deal with a short reinvestment period) are already in the high 100s area. This is not to say that a new deal will be straightforward – among other things, assembling a diversified collateral pool can still create challenges.

Figure 3. CLO BWICs, $million



Source: Citi Research

Profit-takers boost secondary supply

After a quiet few months, September looks like a bigger month for secondary bonds (Figure 3). In reality, though, much of the supply came in the form of triple-As and the level of secondary mezz supply has not increased. Demand is strong, but many legacy holders are reluctant to book losses despite higher prices. In contrast to mezz, the triple-A secondary supply is helped by having values close to par, which is close to where many legacy owners are holding assets. Banks are also better holders of CLO 2.0 assets versus CLO 1.0 for regulatory capital reasons, something which may be prompting some flow. Money-market funds may be incentivized to take up the supply especially if they are shorter-dated seasoned paper. Moreover, the Street has also been short inventory and dealers may be looking to build up their books. Some funds are also looking to take profits and sell into the rally. This

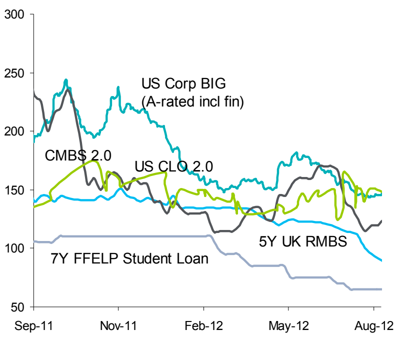
has been most visible in the amount of CLO equity in bid-lists since August and the attractive levels of bids.

Buy CLO Triple-As

Triple-As are cheap to peer assets

For all the robust performance that CLO triple-As have evidenced over the last few years, CLO triple-As continue to trade cheap to its peers as we see in Figure 4. Most risky assets have benefited from the global liquidity injected by Central Banks, whether it is the Fed's latest version of quantitative easing, or ECB injections such as LTRO (or more recently confidence boosts such as Draghi's pledge to "do whatever it takes to save the euro"). In many bank treasurers' minds, the sector is still tarnished with the fall out from sub-prime mortgage-backed CDOs. The CLO market was also affected by its own idiosyncratic issues in the form of JPMorgan losses in its CIO office and the unwinding of previously-held positions (or halting of new purchases). At the same time, more regulatory focus on banks is dampening bank treasury demand. Finally, the absence of CLOs in many traditional fixed income indices also leaves out many investors, and may help to explain the outperformance of the CMBS asset class. Several banks, too, may have been using the mortgage-backed securities market to make up for a shortfall in real estate loans; this has helped CMBS rather than CLOs. There is evidence, however, that more banks are looking at credit, and this should help the CLO market in 2013.

Figure 4. Peer high-quality triple-A structured asset spreads, bps



Source: Citi Research

CLO senior tranches have not defaulted

As new investors start considering the prospect of investing in triple-As it is worth reminding ourselves that triple-A CLOs have never defaulted[1]. As we describe in Global Structured Credit Strategy, the 14 deals which did have principal losses (Figure 5) closed between 1997 and 2001. Most had invested heavily in high-yield bonds whose value deteriorated significantly in the stressful credit environment between 1999 and 2002. These first-generation deals preceded the vast CLO 1.0 universe of CLOs done between 2004 and 2007 and allowed maximum high yield bond exposure (low recoveries on which led to unexpectedly high losses to typically 25% of the asset pool). Other defaults were mostly technical in nature, or occurred because of problems in documentation (for example, one had an unintended market-value feature in the calculation of its OC-based EOD trigger which had an adverse impact after the temporary loan price fall after the financial crisis). Finally most of the deals which have a high likelihood of ultimate principal loss (according to Moody's) also have substantial HY bind buckets similar to the 14 that did default.

Figure 5. CLOs that defaulted, with reason for default

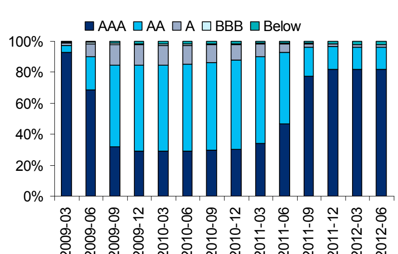
Impairment Type	No of CLOs	No of Impaired Tranches	Highest Initial Rating of Impaired Tranche
Realized principal losses at maturity	14	32	Baa2
Distressed exchange	4	7	A2
EoD because of a market value feature	1	1	Ba2
Other tranches likely to suffer principal losses	12	19	A2
Total	31	59	A2

Source: Moody's

Reinstated ratings reverse overreaction

As seasoned CLO investors are all too aware, the last three years has seen a see-saw behavior from agencies. Most triple-A bonds saw downgrades after the financial crisis (Figure 6). Moody's for example added a 30% default probability stress in its rating model. The stress was a response to the disruption to the capital markets following the collapse of Lehman Brothers and the unpredictability of market conditions. Last year they felt that the stable credit conditions and low default rates for corporate credits warranted a removal of that new stress factor, which, combined with older CLOs starting to delever naturally as they exited their reinvestment period, led to many upgrades. Today, 99.4% of original Moody's rated Aaa tranches are rated above A1[2]. Moreover, new vintage CLOs are expected to be more robust due to increased subordination (35% new vintage versus 25% for older vintages) that includes a new required cushion against future downgrade risk.

Figure 6. Distribution of original AAA-rated tranches versus time



Source: Citi Research, Moody's

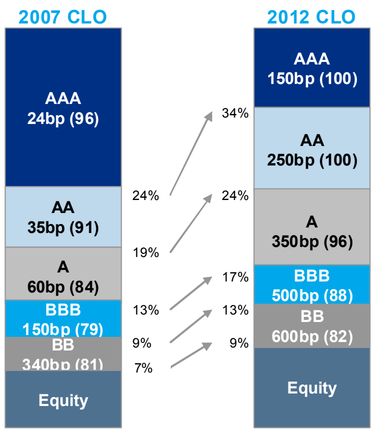
[1] *Losses in US Cash Flow Tranches are Infrequent*, CLOInterest, Moody's, 25 July 2012

[2] *Structured Finance Rating Transitions: 1983-2011*, Moody's, 23 March 2012

CLO Triple-As – Old or New?

Higher coupon, but new has a lot more

Figure 7. CLO 1.0 versus CLO 2.0; also shown coupons and prices (within brackets)

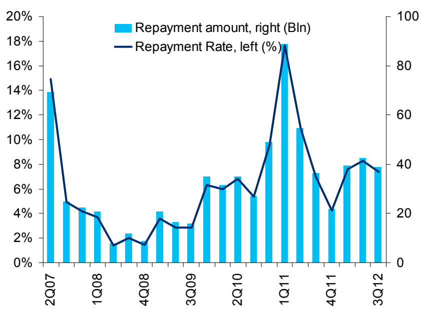


Source: Citi Research

A lot of recent debate has been about the value of CLO 2.0 versus CLO 1.0 (Figure 7). A major source of change is an increase in subordination. For example, Moody's recalibrated the default probability and recovery rate assumptions in its model in order to reduce the likelihood of future rating volatility resulting from assumption changes. So even though they removed the 30% stress (see previous page) the other changes to the model generally increased enhancement levels above pre-crisis levels. Other than higher subordination, debt tranches are also paying higher coupons relative to pre-2008 deals. The portfolio is cleaner too - currently 90-95% of a typical CLO 2.0 portfolio consists of senior secured loans, compared to 85-90% in the older version. No structured securities (typically other CLOs) may be included, unlike in CLO 1.0s.Moreover, tighter documentation regarding reinvestment in longer-dated collateral, allowing extensions of existing loans, and length of reinvestment period should all result in shorter and more certain average lives of senior tranches.

Older (CLO 1.0) deals can be shorter

Figure 8. US quarterly loan repayment rate

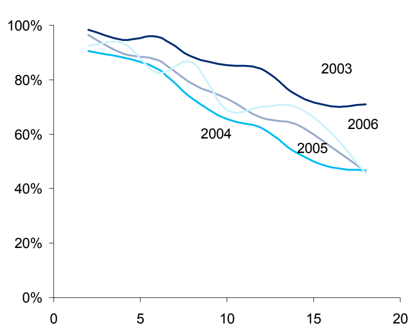


Source: S&P LCD

A shorter investment horizon and an opportunity for capital gains for secondary CLO 1.0 triple-As bought at high 90s price makes us recommend the older deals. Triple-A buyers will often price deals assuming a 10-20% prepayment rate. Figure 8 shows, however, that the repayment rate is running between 25 and 30%. Moreover loans are subject to repricing risk and current loan technicals such as new CLO creation and mutual fund flows are likely to keep the repayment rates high for a while. As a result triple-As are rapidly amortizing (Figure 9). More deals are likely to get called too. History (see Global Structured Credit Strategy) shows that there are two reasons for getting called. For older vintages (such as the 2001-2004 deals) the reason is that the average liability costs increase as triple-As pay down at the end of the reinvestment period (and will equal the liability costs of a new deal at some point), and, simultaneously, the leverage for equity declines. Moreover, with higher loan prices, the NAV of the portfolio may result in a higher immediate payout than the present value of these future cashflows. Both of these factors should result in more refinancings. Newer deals (from 2008 and 2009) are also refinancing candidates if triple-A spreads tighten a little. With the tightening, these deals will be able to reduce their liability costs by rolling into a new transaction.

Spreads have converged

Figure 9. Triple-A bond factor, by vintage, versus quarters after end of reinv period



Source: Citi Research

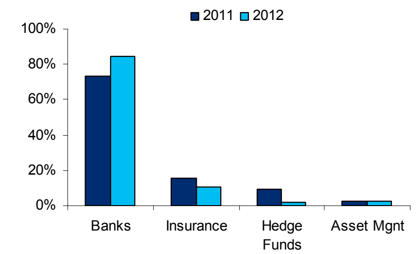
As a result of the shorter average lives and potential for capital gains in the event of a deal call, senior spreads have converged between CLO 1.0 and CLO 2.0. In some cases, the older deals have traded through new issue. A year ago, CLO 1.0 traded 60-75bps wide to CLO 2.0. The convergence between the two versions is made all the more remarkable given that CLO 2.0 is more suitable for banks (the floating rate nature of CLOs make them an ideal bank product, see next section) as they are not considered resecuritizations and attract lower regulatory capital. However money-market funds that have no such regulatory disincentive may prefer the CLO 1.0 shorter duration, despite the advantages offered by the newer version that we have highlighted above.

Bank Involvement will Continue

CLO triple-As make sense for banks

Banks are getting increasingly involved in CLO senior bonds (Figure 10) – this time for the right reasons. Investors will recall many of the legacy banks bought CLO 1.0 senior tranches in leveraged vehicles such as ABCP conduits or SIVs. The vehicles ran into a liquidity crisis as they were not able to roll their shorter-dated CP liabilities that funded these longer-dated assets. Eventually the senior bonds (CLOs were only a small part of the portfolio which typically consisted of financials and a broader range of structured finance assets) were brought on the vehicle sponsors' balance-sheets. In the current market, banks are funding the assets internally. The reasons for investment are relative value, protection from credit losses, and the floating-rate nature of the bonds being apposite for the way banks fund themselves. Not only has the volume invested grown reflecting the higher size of the primary market, the number of investors has also increased (Figure 11). It also so happens that senior CLO tranches, especially of CLO 2.0 bonds, give a very high return on capital.

Figure 10. Purchases of CLO 2.0 triple-As by investor segment

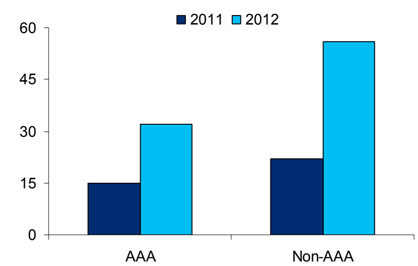


Source: Citi Research based on internal deals

QE3 has increased US banks' need for yield

QE1 and QE2 has already led to excess bank reserves left at the Fed to increase, and resulted in tightening in yield for higher quality collateral such as treasury and Agency debentures and MBS. QE3 is likely to do more of the same. Even though banks are reporting a better lending environment, the odds are that most of the excess liquidity will end up being invested into more securities. With traditional MBS product already getting pretty rich, there's a good likelihood banks will be looking for higher coupon alternatives with relative value. Senior CLO bonds could fit the bill.

Figure 11. Number of new investors



Source: Citi Research based on internal deals

High return on bank capital

Figure 12 shows our estimate of the capital that is required in the standardized Basel approach (Basel III, based on ratings) and in the rule put forward by the joint US agencies (SSFA). Because of the Dodd-Frank Act, banks cannot use external ratings to assess capital charges for structured assets. The new rule is based on tranche subordination and quality of underlying collateral. (See US Bank Capital Rule on Structured Credit for details). CLO 1.0, being considered a resecuritization, has a higher weight for the same rating under both systems. The sample illustration shows that return on capital (ROC) regulatory capital on senior tranches still remains attractive for the US bank SSFA approach, but reduced versus Basel III.

US banks will get a much higher return on regulatory capital for investing in CLO 2.0 bonds. This leads to the conclusion that where possible, banks may decide to roll into bonds that are not penalized by the agencies' resecuritization haircut. Conversely, investors who do not find such a regulatory disincentive such as funds may well prefer the wider spread, discount prices and greater choice in the CLO 1.0 universe.

Figure 12. Illustrative return on capital (ROC) under Basel III and US (SSFA) interpretation

	CLO 2.0	CLO 1.0
Rating	AAA	AAA
Attach	33.80%	27.40%
Detach	100%	100%
Basel III	0.56%	2.40%
SSFA	1.60%	5.70%
Spread	1.45%	1.50%
Basel III ROC	259%	63%
SSFA ROC	91%	26%

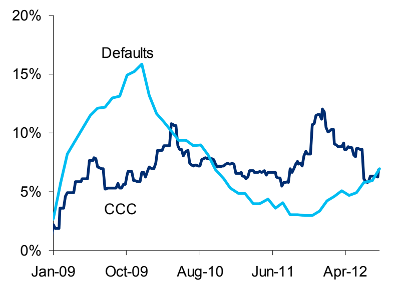
Source: Citi Research

Euro CLO Mezz – Much to Hope

Defaults rising, but…

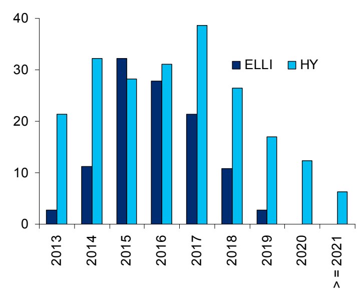
Standard and Poor's latest European default study[3] of speculative grade companies may not surprise investors, but certainly will make loan and CLO investors take notice. As a counterpoint, though, an earlier but still recent recovery study on senior secured bank loans was a pleasant surprise with better data than initial rating agency assumptions. Let's start with the default. The economic and political uncertainty combined with a worsening growth and credit outlook is pushing LBO loans that are approaching maturity into a difficult position. The default rate of speculative-grade companies (rated 'BB+' or below) rose to 5.3% at the end of the second quarter, from 4.7% at the end of March 2012. Most of the recent defaulters were LBO, with several having defaulted previously. Further, the agency anticipates that the trailing 12-month default rate will edge up further over the next 12 months to reach 6.3% (or more) by the end of June 2013. Quite apart from the risk of the overall economic environment worsening more than their base case, there is a sizeable amount of debt coming due in the next two years (Figure 14). Issuance isn't helping to relieve the maturity wall either. In loan space, 2012 issuance is falling well short of 2011; the first nine months of 2012 have seen €20.4 billion issued, which is 45% lower than the year-ago period. HY bond issuance till Sep 28 2012 was EUR 27bn compared to EUR 34bn for the same period last year.

Figure 13. Trailing 12M speculative grade default rate, and percentage of ELLI universe rated CCC/CC



Source: S&P LCD

Figure 14. Distribution of debt maturities

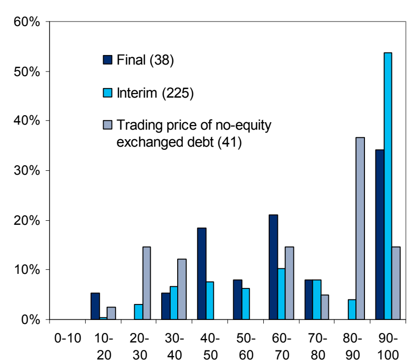


Source: S&P LCD

..recoveries surprise positively

Recoveries, on the other hand, have been good. Standard and Poor's found[4] that mean nominal recoveries on European first-lien secured debt instruments that defaulted between 2003 and 2010 was 76%, which compares favorably with the US. However, the nominal European recovery rate includes a high volume (65%) of interim recoveries, generally debt exchanges, which could change with time. The smaller universe of credits for which ultimate recoveries are available (that is, the value of the settlement a lender receives by holding an instrument throughout its emergence from default) shows a lower, but still attractive, median recovery rate of 67% (Figure 15). Not only are these numbers higher than the agency assumptions for many European regimes when a CLO was created, the data also shows that recoveries for France and Spain are as good as, or better than, recoveries for the UK, despite the latter having a secured creditor-friendly legislation.

Figure 15. Recoveries on European corporate first-lien debt. Universe size shown in parentheses.



Source: Citi Research

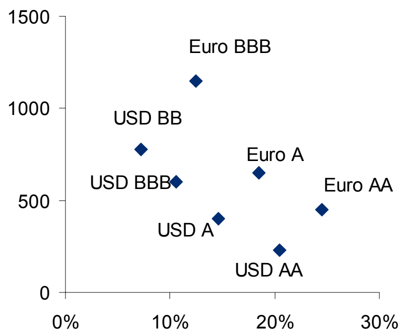
Trading prices can also provide additional insight even though, as the agency states, the secondary market for distressed debt is illiquid overall and there is some skepticism over whether or not debt is being written down to a sustainable level during restructurings. If we compare the restructurings where senior debt was simply converted into new instruments at par without additional equity given to the original investors, the mean and median recovery rates of the observed debt exchanges are 94% and 100%, respectively. However, the trading prices indicate a mean of 65% and a median of 80% (Figure 15). Where the exchange resulted in the investor receiving equity and loan, the trading value for just the loans is lower.

For CLO mezz, the mean default and recovery rates should still lead to a good outcome for an average-quality European deal, especially in light of the higher yields available in the European market, relative to the US. We consider the relative value proposition in greater detail below.

[3] *European Corporate Defaults Are On The Rise As Eurozone Stresses Continue*, Standard and Poor's, 25 Sep 2012

[4] *Europe's Senior Loan Market Delivers A Strong Recovery Performance Over Its First Cycle*. Standard and Poor's, 30 Apr 2012

Figure 16. Current subordination (x-axis) and spread, bps, for Euro and US CLO 1.0



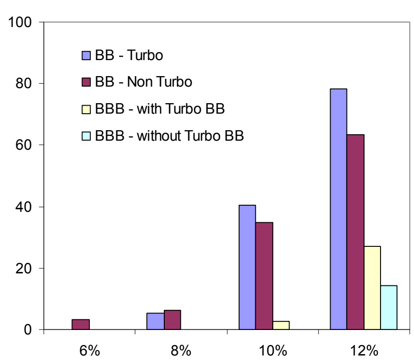
Source: Citi Research

Figure 17. Sample universe of Euro CLO double- and triple-B tranches

	Turbo	Non Turbo
Sample Size	41	63
Attachment, median %	9.30	9.00
Attachment, std dev %	3.70	3.60
Interest diversion cushion, median %	-0.51	0.03
BB OC cushion, median %	2.57	2.72
BBB OC cushion, median %	5.72	6.00

Source: Citi Research, Intex

Figure 18. Percentage of Euro CLO sample universe having principal loss versus assumed annual default rate (senior and mezz loan recovery at 60% and 20%)



Source: Citi Research, Intex

Do Turbos Matter for Euro BBBs?

Relative value despite rally

In a headline driven world, it is not surprising that the general rally in risk-assets, especially after statements by the ECB President to do all that is necessary to preserve the Euro, should benefit European CLOs. Mezz bonds have rallied as the Data Appendix in this report shows, but even now, lthe gap (Figure 16) between European and US CLOs should tempt some investors at least. Not only are spreads wider for European deals, but subordination level differences between the two CLO types are still intact after the credit cycle (because of lower recovery assumptions and lower diversification, Euro deals started life with higher subordination). Last year saw the spread discrepancy between the two CLOs initially decline at the beginning of the year with the entry of more relative-value investors, especially from the US. That momentum then declined, as investors chose to dig deeper into the US CLO capital stack to meet their yield requirements, but with signs of progress among European policymakers, the spread differential has narrowed a little. We predicted as such in our July Global Structured Credit Strategy. Investors should be aware of this marginal investor dynamic as they put money to work in this market.

Turbo good for double-B, not bad for triple-B

That investors prefer double-Bs where excess interest pays down double-B debt to those that do not is not surprising, The relative attraction gets stronger when the tranches are close to failing their trigger and would then divert interest under their terms (a 'turbo-BB') as opposed where cash is diverted whenever it is available (a 'fast-pay'). Investors also say they prefer triple-Bs in deals that do not have turbo-BBs because such deals, in theory, trap interest in a credit deterioration which could be used to pay down more senior bonds. We think the value of this benefit is marginal, and if investors can pick up triple-B bonds that are cheap only because of this feature, they should do so.

To test the hypothesis we selected a set of double- and triple-B tranches from the Euro CLO universe that did have the turbo feature, and others that did not. In addition to the original rating, we tried to keep the distribution of subordination below the samples similar to prevent one group performing better than the other under stress cases because of different attachment levels. The statistics for the two samples are shown in Figure 17. We subjected the collateral in each CLO to different default stresses (keeping the recovery and prepayment levels the same) to determine the rate at which tranches would lose principal or have interest shortfalls.

The results in Figure 18 show that triple-Bs, with or without turbos, are resilient well beyond the default and recovery assumptions that are forecast in the European markets (and only a small part of the double-B universe shows losses). Triple-Bs from turbo deals do a little worse but only under very high default rates. Double-Bs with turbos do slightly better as one would expect under moderate default rates but seem to do a little worse under much higher default rates, possibly for a slightly lower cushion in our sample (Figure 17). Overall, we feel that the presence of the turbo causes underperformance only at very high default rates and, unless investors consider this as their base case, they should use other considerations to select their bonds.

Appendix

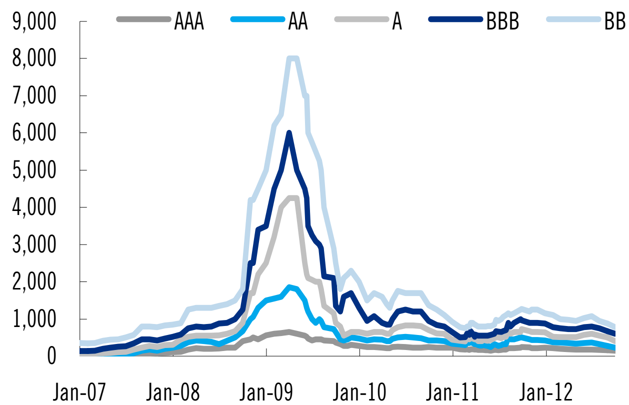
Cash Flow CDO Market

Figure 19. Secondary Cash Flow CDO Spreads/Prices

Collateral Type	AAA	AA	A	BBB	BB
US HY CLO 1.0 (Spreads) – 1-*Oct-12*	145	230	400	600	775
US HY CLO 1.0 (Prices) – 1-*Oct-12*	Mid 90s – High 90s	Low 90s – Mid 90s	Low 70s - High 80s	Mid 70s –Low 80s	High 70s –Mid 80s
US HY CLO 2.0 (Spreads) – 1-*Oct-12*	145	230	355	540	740
US HY CLO 2.0 (Prices) – 1-*Oct-12*	High 90s - Par	High 90s – Par	Low 90s – High 90s	Mid 80s – High 80s	Mid 70s – Mid 80s
Euro HY CLO (Spreads) – 1-*Oct-12*	190	450	650	1150	1600
Euro HY CLO (Prices) – 1-*Oct-12*	Mid 90s – High 90s	Low 80s – Mid 80s	Low 70s – High 70s	Mid 50s – Mid 60s	Mid 50s – Mid 60s

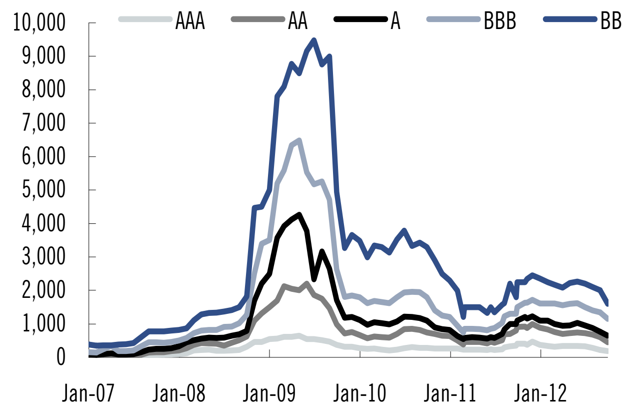
Source: Citi Research

Figure 20. US CLO Tranche Spreads



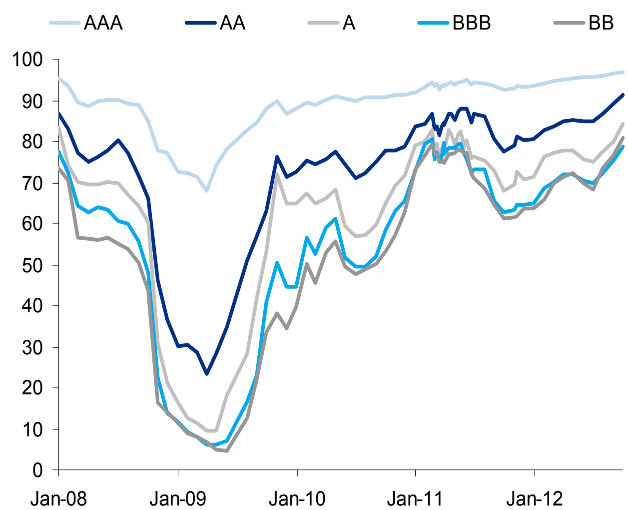
Source: Citi Research

Figure 21. European CLO Tranche Spreads



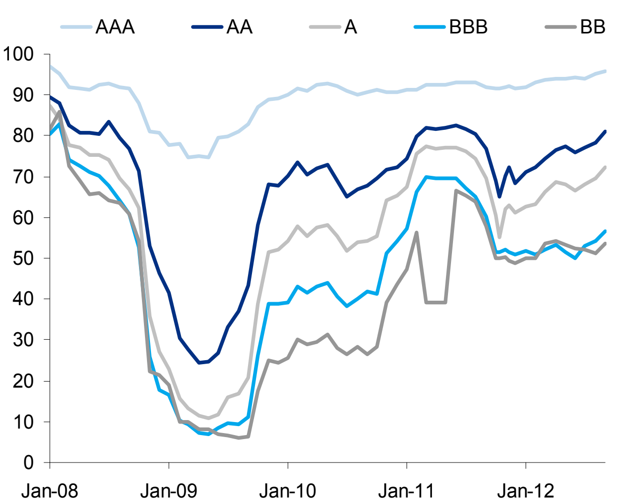
Source: Citi Research

Figure 22. US CLO Tranche Prices



Source: Citi Research

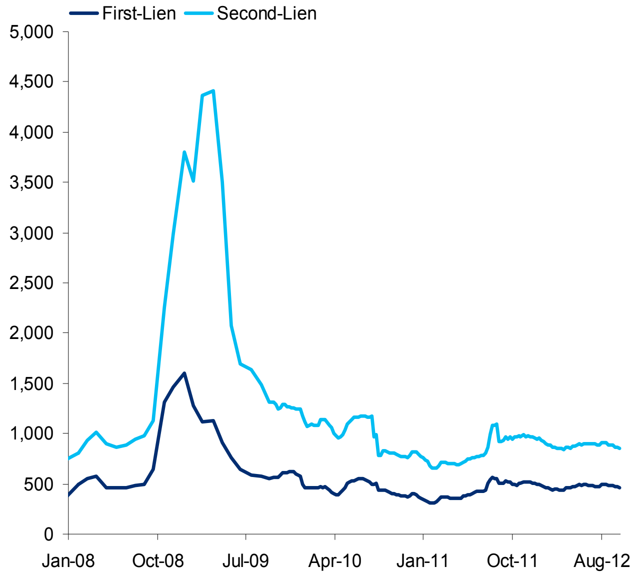
Figure 23. European CLO Tranche Prices



Source: Citi Research

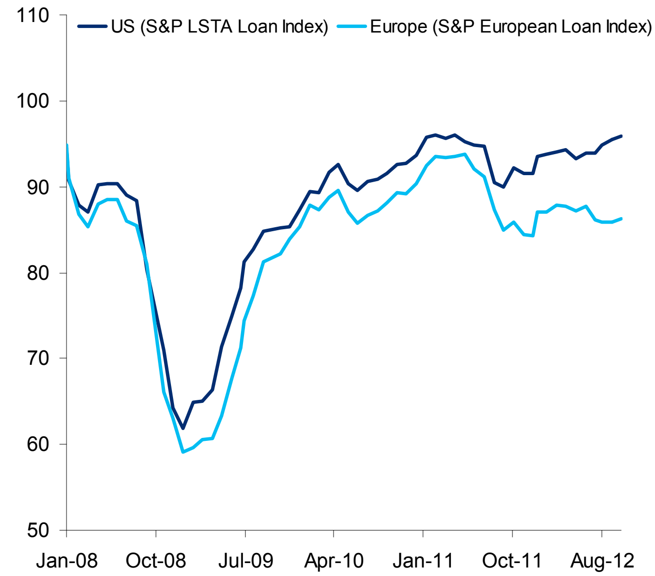
CLO Collateral

Figure 24. Avg First and Second-Lien Secondary Spreads to Maturity



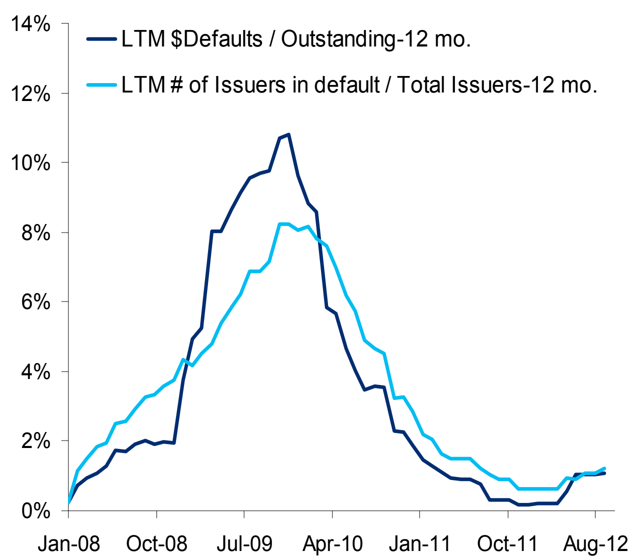
Source: S&P

Figure 25. Weighted Average Bid



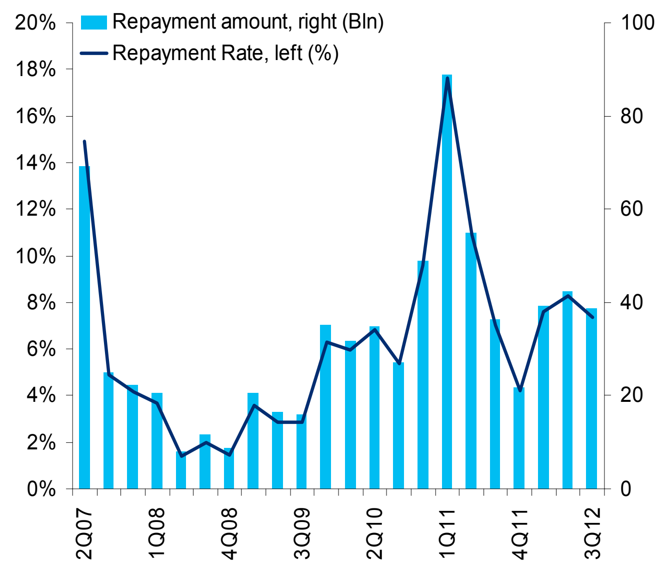
Source: S&P

Figure 26. US Lagging 12mo. Default Rate by Principal and # of Issuers



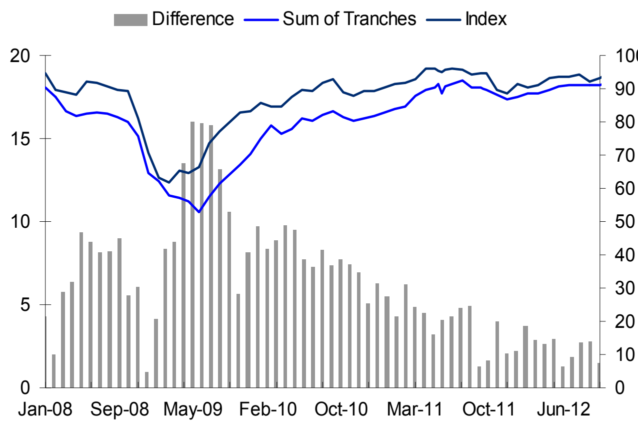
Source: S&P

Figure 27. US Quarterly Repayment Rate and Repayment Amount



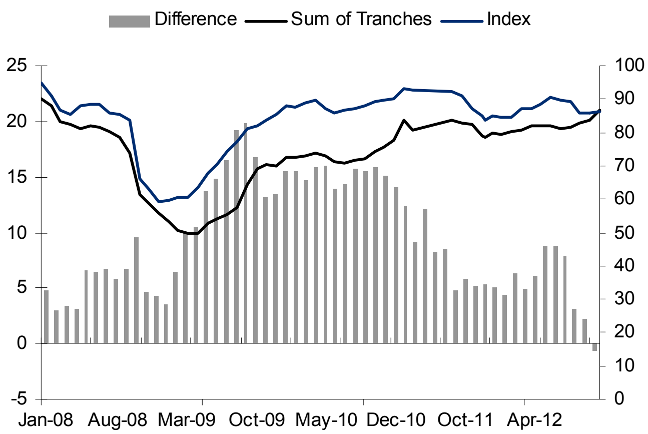
Source: S&P

Figure 28. Collateral/Tranche Arbitrage (US Deals)



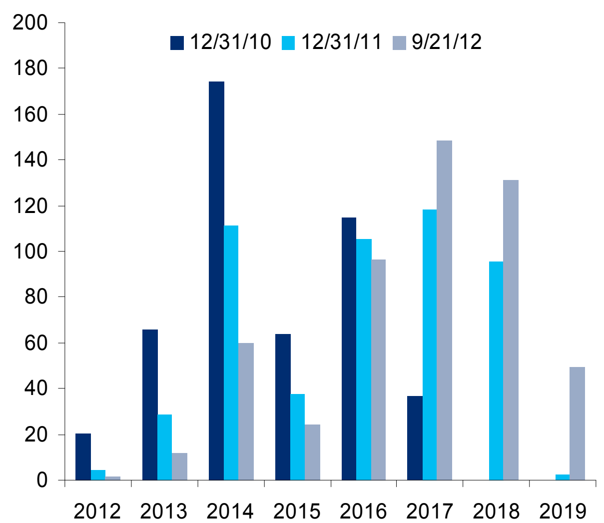
Source: Citi Research

Figure 29. Collateral/Tranche Arbitrage (EUR Deals)



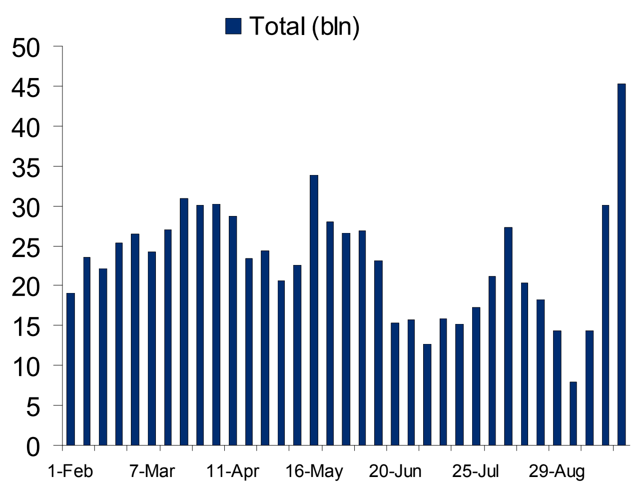
Source: Citi Research

Figure 30. US Loan Distribution by Year of Maturity



Source: S&P

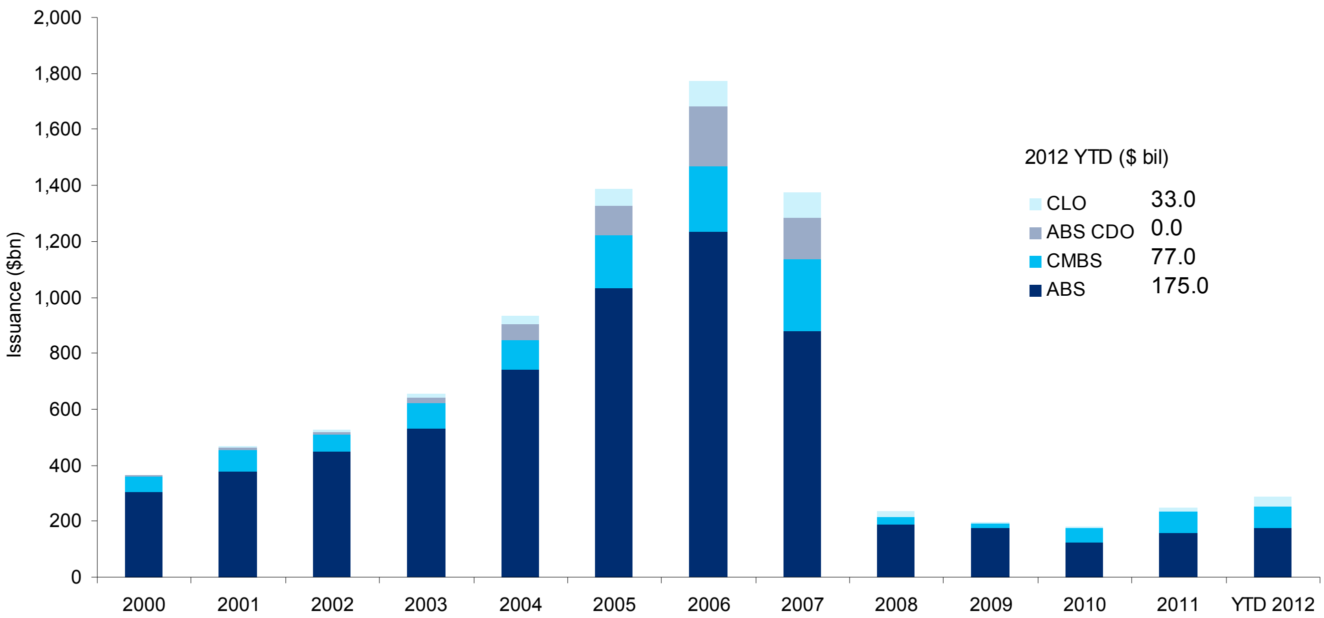
Figure 31. US Institutional Loans Launched to Market (Rolling 30-Days)



Source: S&P

Securitized Products Issuance

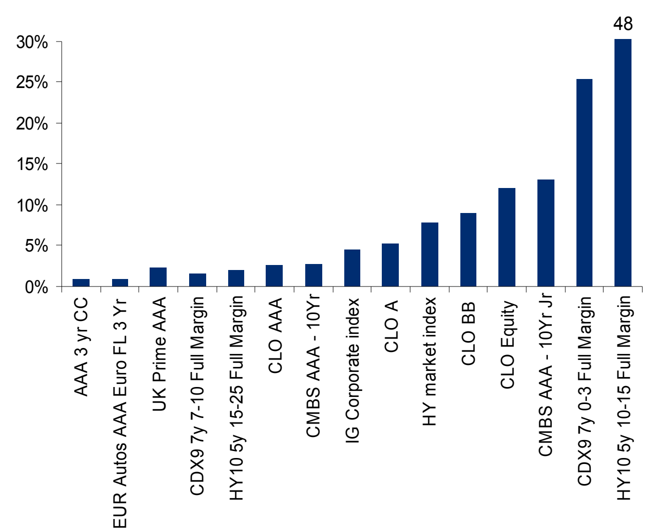
Figure 32. Year-to-Date CDO Issuance and Securitization Market Historical Issuance ($bln)



Source: Bloomberg, Citi Research

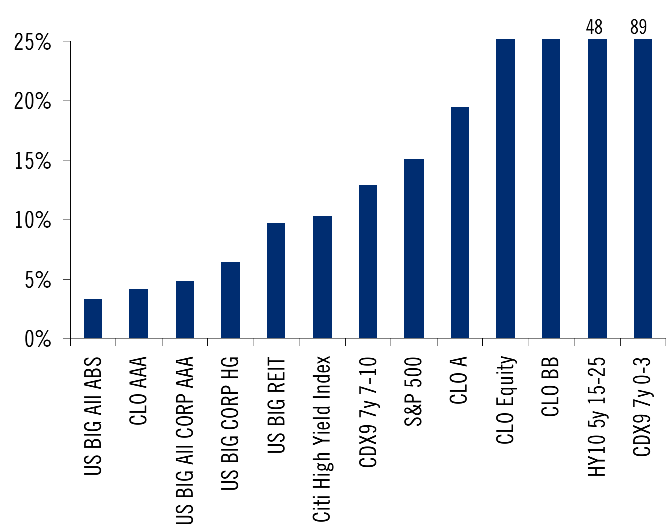
Securitized and Non-securitized Products Returns

Figure 33. Simple Yield



Source: Citi Research

Figure 34. Total Returns, YTD 2012



Source: Citi Research

Appendix A-1

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