

Risk Retention for CLOs:

A square peg in a round hole?

November 2013

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Background and purpose of this study

On August 28, 2013, the federal regulatory Agencies re-proposed credit risk retention requirements for asset-backed securitizations, including Collateralized Loan Obligations (CLOs). This re-proposal significantly expands on the brief reference to CLOs included in the original April 2011 proposal, and discusses and responds to the commentary provided by a wide range of CLO market participants in the interim.

This study assesses the potential impact of this latest risk retention proposal on the CLO market, the broader leveraged loan market, and the general credit market for affected corporate borrowers. It examines the unique role played by CLOs in linking many firms to credit sources they would otherwise have difficulty accessing, as well as the structural features that differentiate CLOs from the securitization models that motivated the adoption of the risk retention requirements in the Dodd-Frank Act. We then assess potential effects of the latest proposal – in particular its identification of CLO managers as feasible and appropriate risk-retaining parties – on the continuing ability of the CLO market to channel credit to leveraged loan borrowers.

This report was sponsored by the Loan Syndications and Trading Association (LSTA) and supported by data, interviews, and proprietary information provided by a number of institutions affected by the proposed rule. All findings and recommendations below are solely our own.

1. Executive Summary

As they work to implement the securitization risk retention requirements established by the Dodd-Frank Act, the federal regulatory Agencies face a particularly difficult policy design challenge in the case of Collateralized Loan Obligations (CLOs).¹

CLOs play a significant role in credit provision that could be threatened.

- Over the last 30 years, a large and vibrant segment for corporate credit has emerged in the form of leveraged loans and high yield bonds
- The evolution of these “leveraged finance” credit markets has improved the availability and flexibility of credit for corporate borrowers, especially those that may not fit the traditional criteria that came to define “investment grade” (IG) borrowers
- A major source of credit for these companies is CLO vehicles; CLOs today provide \$280 BN of credit to non-IG corporate borrowers, equal to 45% of overall outstandings in institutional leveraged loans²

Limiting CLOs through risk retention requirements (or other means) will reduce the availability of credit, increase the cost of financing for corporate borrowers, or both.

- As proposed, the risk retention rule for CLOs would result in more than \$200 BN of lost credit capacity from CLO investors in our baseline scenario (see section 4 for detailed methodology and estimates)
- Non-CLO credit sources such as hedge funds and retail leveraged loan funds may ultimately replace a portion of lost CLO credit capacity, but will almost certainly do so only at an increased cost to borrowers
- Even in the unlikely case that such alternative credit sources could fully replace lost CLO investment capacity, affected corporate borrowers would plausibly end up paying interest rates that were higher by 1.5% (150 bps) or more, equivalent in today’s market to an increase in annual interest costs of \$3.2 BN (see section 4 for detailed methodology and estimates)

The structure of the CLO market is distinct from the securitization models that motivated the adoption of risk retention requirements.

¹ Throughout the paper, we use the term “CLO” to refer to CLO structures actively managed by investment professionals, and not to “balance sheet CLOs” that primarily contain loans originated by an affiliated lender.

² Unless otherwise noted, we use the term “leveraged loans” to refer to institutional loan tranches, not including the pro rata (bank) tranches of leveraged loans. Refer to section 2.1 for an overview of the leveraged finance market.

- In common with securitizations in general, CLOs create real economic value through diversification and risk transformation (via tranching)
- In the MBS and ABS securitization markets that policymakers have focused on in developing the overall risk retention framework, these securitization techniques are used to move whole assets from the balance sheets of lenders to an affiliated vehicle, for sale to capital markets investors
- In the case of CLOs, these techniques are instead used to provide a stable source of client funding to build an investment portfolio of assets that were not originated by CLO managers
- This differentiated market model for CLOs is accompanied by a distinctive track record of credit performance, with less than 1.5% in cumulative impairments since 1996

These facts combine to make it difficult and potentially disruptive to apply the general risk retention framework to CLOs.

- The institutional logic of risk retention is rooted in the loan credit model, where the original lender and other downstream intermediaries in the credit chain each buy the loan and hold it on their balance sheet
- By contrast, a CLO manager is not a financial intermediary that has a significant balance sheet of its own, but an independent, fee-for-service agent acting on behalf of its investor stakeholders
- The re-proposal does include an alternative mechanism in which lead arrangers of leveraged loans could serve as risk retainers for specific loans, which would then be eligible for CLOs to purchase; unfortunately, this option seems infeasible in practice

Given these unsolved challenges, we recommend that policymakers proceed cautiously, working to fit (not force) CLOs into the broader risk retention framework being designed in order to mitigate the potential for unintended consequences.

2. Credit intermediation in the leveraged finance market

The re-proposed risk retention rules paint CLOs and other forms of securitizations with a similar brush. However, key differences in how these forms of credit intermediation work suggest that proposals tailored to other forms of securitization may prove detrimental to the formation of CLOs, and therefore to investors and borrowers that benefit from leveraged loan financing.

This section summarizes the salient features of the CLO and underlying leveraged loan markets, as well as the complementary high yield bond market. Subsequent sections present our views on how the re-proposed requirements fail to fully take into account the unique aspects of the CLO market and its role in the leveraged finance market.

2.1. Overview of the leveraged finance market

The leveraged finance market, generally comprising high yield bonds and leveraged loans, is an important source of corporate credit. It funds day-to-day operations and major capital investments for a wide range of firms, and is also widely used to finance mergers, acquisitions, and buyouts (as when a private equity sponsor buys a public company, taking it into private ownership for a time). On the investor side, leveraged finance products allow institutions with a range of risk-return objectives to participate in the credit markets.

The total value of outstanding credit in the leveraged finance market is nearly \$2.2 TN, comprising \$1.0 TN of leveraged loans and \$1.2 TN of high yield bonds.³ These two credit channels – loans and bonds – compete with and complement one another. As among investment grade corporate borrowers, many non-IG borrowers use both as sources of credit. Each credit channel comes with distinctive advantages and limitations.

The issuance of high yield bonds allows borrowers to access capital from a large and diverse set of capital markets investors. It very much operates according to the norms of the standardized, “mass market” credit channel of the bond market. This means that borrowing terms are relatively standardized, and that larger borrowers with established credit “brands” are favored. Smaller, less established borrowers may not be able to raise debt through bond issuance, or may be able to do so only under unfavorable terms. The bond market as a whole is generally governed by a strict set of rules (covering everything from pre-offering marketing to investor suitability to disclosure of company information).

³ S&P Global Fixed Income Research. Data as of March 2013. Leveraged loan total includes total committed amount.

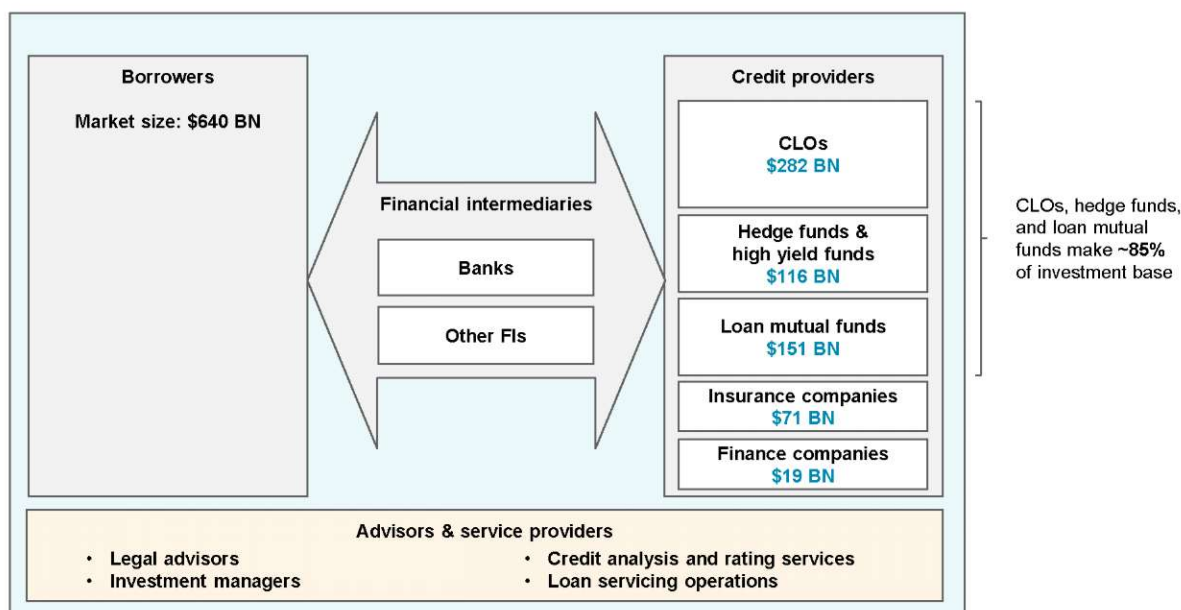
Loans, by contrast, offer lending terms that are much more flexible and customizable to meet specific economic and borrower needs. Leveraged loans are typically much more easily prepaid, renegotiated, or extended than high yield bonds. The advantage of leveraged loans is that this flexibility is combined with (much of) the credit price and availability advantages that are usually found in the capital markets. This mix of flexibility and credit access is largely due to two features of the leveraged loan market.

First, leveraged loans combine funding from two sets of credit providers, using a distinctive structure:

1. A “pro rata” component that is held by primarily bank lenders, and that in today’s market largely consists of a revolving credit commitment that would be difficult to place in the capital markets because of the associated ongoing funding requests
2. An “institutional” component of funded term credit, that is syndicated to a broader array of credit providers

The institutional segment of the leveraged loan market, summarized in the diagram below, currently includes approximately \$640 BN in outstanding credit, or about 30% of all non-IG corporate credit.

Exhibit 1: Map of institutional leveraged loan market
\$US BN, 2013¹



1. As of October 2013

Note: Figures shown do not account for a small portion of the CLO assets that may not be invested in loans

Source: S&P/Capital IQ/LCD, Thomson Reuters LPC, Citi estimates, Oliver Wyman analysis

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The second institutional feature of the leveraged loan market that allows for borrowers to get an advantageous combination of flexibility and credit access (and thus pricing) is

the presence of specialized investment vehicles. Investment vehicles – in which end-investor client funds are pooled and managed by professional investment managers – provide the vast majority of investment dollars in the institutional leveraged loan market (~85% currently).

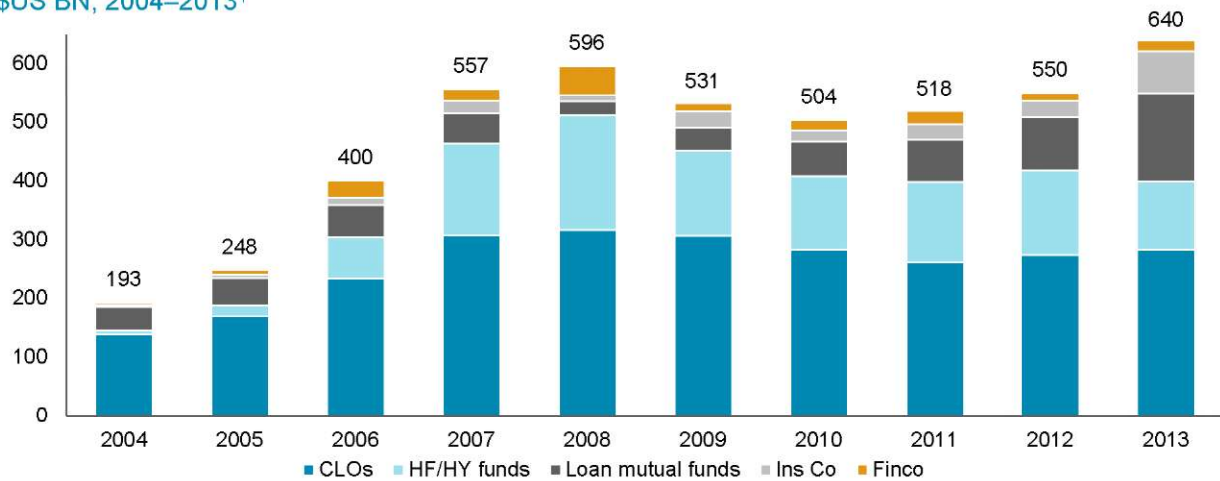
Many investors in these leveraged loan investment vehicles would not have the ability or willingness to shoulder the wide range of operational and administrative burdens that are required of lenders, including

- Loan administration, including tracking and reconciliation of interest rates, principal and interest payments, amortization, etc.
- Management of material non-public information on borrowers, and associated compliance
- Settlement of loan trades, without centralized clearing and settlement market infrastructure
- Review and negotiation of loan term amendments
- Participation in loan workout negotiations and processes, as necessary

Investment vehicles that specialize in leveraged loans (whether they are hedge funds, mutual funds, or CLOs) can provide enough market scale to take on these responsibilities economically, allowing their investors to access a major segment of the credit markets without undue burden.⁴

⁴ Intriguingly, one major class of CLO investors – banks – is clearly able and willing to shoulder the operational burdens of lending. However, banks invest in lower-risk CLO securities precisely because they are not loans; more specifically, they are low-risk securities that are generally more liquid than loans. Banks hold a relatively liquid investment portfolio of such securities as an element of sound asset-liability management.

Exhibit 2: Loans outstanding by investor type
\$US BN, 2004–2013¹



1. All year-end figures except for 2013 which is as of October 2013

Note: Figures shown do not account for a small portion of the CLO assets that may not be invested in loans

Source: S&P/Capital IQ/LCD, Thomson Reuters LPC, Citi estimates, Oliver Wyman analysis

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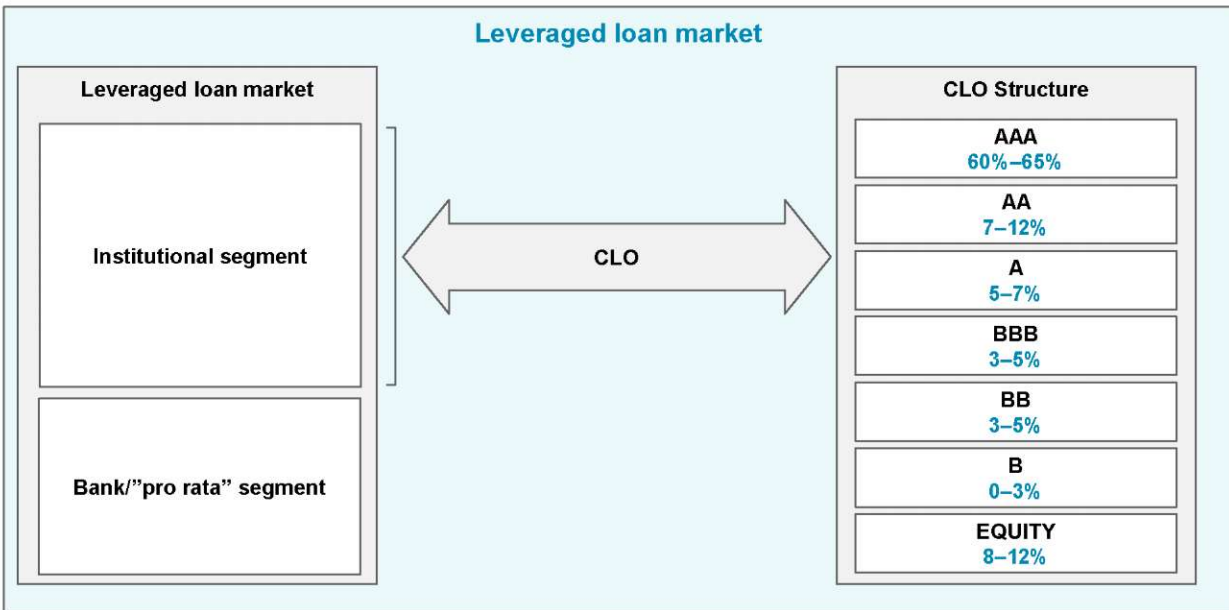
The relative shares among different types of institutional leveraged loan investors has varied over the last decade, with CLOs consistently providing a large share of overall credit, hedge funds and high yield credit funds providing a relatively large share during the crisis, and loan mutual funds making up an increasing portion of the market in recent years.

Below, we discuss one type of pooled vehicle for investing in institutional leveraged loans – CLOs – in more detail.

2.2. Overview of the CLO market

Like most other forms of securitization, CLOs connect bond market investors with loan borrowers. This is the premise and promise of securitization in general: to connect the sharply different institutional worlds of loans and bonds. If the link is effective, many investors get a wider range of investment opportunities, and borrowers a broader network of potential capital sources – resulting in more efficient financing for the real economy.

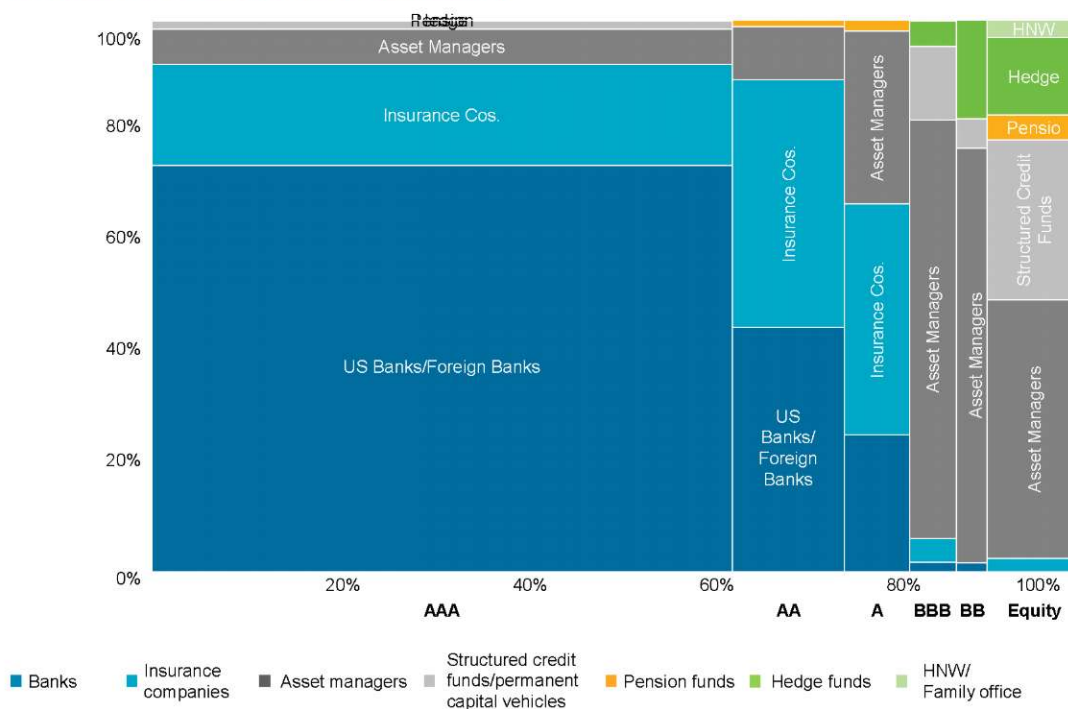
Exhibit 3: Role and structure of CLOs within the leveraged loan market



Source: Oliver Wyman analysis
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The CLO structure broadens the range of available credit providers by use of tranching. Cashflows from pools of institutional leveraged loans are divided into different CLO liability tranches, many of which are associated with risks and returns lower (or higher) than the underlying leveraged loans. Senior tranches have priority claims on cash flows generated by loan portfolios and as such have greater protection from credit losses compared to junior tranches, and therefore carry lower yields. From an investor's point of view, the multiple debt tranches of a CLO present investment opportunities with varying risk/return profiles.

Exhibit 4: Share of CLOs held by investor type and CLO tranche rating
Total CLO market: \$280 BN (as of October 2013)



Source: Oliver Wyman analysis, Citi estimates of investor distribution

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For example, conservative investors that are looking to balance modest exposure to diversified corporate credit risk with strong likelihood of principal repayment tend to invest in the senior-most CLO tranches; the investment portfolios of both US and foreign banks are one large segment of such investors. Hedge funds and others looking to produce equity-like returns tend to invest in the most junior CLO tranches. By matching risk characteristics to specific investor risk appetites, a more efficient market-wide allocation of credit can be achieved, reducing the overall cost of credit to the economy.

This funding structure and its accompanying market practices have generated remarkably low credit impairments, of less than 1.5% cumulatively since 1996.⁵

⁵ Moody's Investors Service

3. Analysis of CLO risk retention policy options as presented in the most recent NPR

We view the structural and institutional features of non-IG corporate credit (summarized above in Section 2) to be critical to understanding how the general logic of risk retention fits – or does not fit – the CLO market.

To illustrate why, we first review the overall logic for risk retention. The risk retention rules legislated in the Dodd-Frank Act are intended to address acute moral hazard problems that developed when investors in many pre-crisis securitizations lacked sufficient information to make meaningful judgments about the credit risk of the assets within the securitized structures. By contrast, effective credit intermediation models – such as corporate bonds purchased by investors – provide the parties that will bear the risk of loss with both the incentives and the information to assess the level and pricing of risks. This contrast is summarized in the table below.

Exhibit 5: Comparison of credit intermediation models
Consumer loan securitization and corporate bond issuance

	Consumer loans being securitized	Bond issued by a corporation
Who decides whether a given borrower is creditworthy?	• Original lender	• Capital market investors that buy that issuer's bond
Who sets price of credit for the borrower?	• Original lender	• Capital market investors that buy that issuer's bond
Who bears ultimate risk of loss?	• Ultimate holders of securitized loan	• Capital market investors that buy that issuer's bond
Transparency of credit information to ultimate bearers of risk	• Very limited borrower-level information • No borrower-level price signals	• Borrower-level information available to investors • Bond-level price signals

Unlike investors in consumer credit securitizations, investors that purchase a corporate bond have access to significant levels of ongoing borrower-specific information.

The same is true for the institutional segment of leveraged loans, which align the risk of loss with the ability to make critical judgments about the creditworthiness of specific borrowers and whether that risk is appropriately reflected in the market price of the borrowers' debt. Both those credit providers that participate in the primary loan syndication as well as those who subsequently buy the loan on the secondary market have ready access to borrower-level credit information and daily market signals of creditworthiness, as summarized in the table below.

Exhibit 6: Comparison of credit intermediation models

Consumer loan securitization and institutional leveraged loans

	Consumer loans being securitized	Institutional leveraged loans
Who decides whether a given borrower is creditworthy?	Original lender	Lenders that decide to participate in a loan to that specific borrower
Who sets price of credit for the borrower?	Original lender	Lenders that decide to participate in a loan to that specific borrower
Who bears ultimate risk of loss?	Ultimate holder of securitized loan	Lenders that decide to participate in a loan to that specific borrower
Transparency of credit information to ultimate bearers of risk	- Very limited borrower-level information - No borrower-level price signals	- Borrower-level information provided to participating lenders - Daily borrower- and loan-level price signals

Those who make decisions about credit availability and pricing to specific borrowers in the leveraged loan market (whether they participate in the loan when first made or via the secondary market) are the same as those who bear the credit risk.

And finally, what about CLOs? We would argue that a CLO is best viewed as loan fund that, unlike common open-ended funds, does not offer investors the ability to enter and exit the fund on an ongoing basis. Instead, the investors in CLOs effectively agree to provide a certain amount of investment over a defined period, providing a predictable pool of funds that the CLO manager actively directs to specific non-IG borrowers (within risk parameters agreed upon with the investors in the CLO). This pre-agreed term funding model also allows for tranching of repayments and economic returns, so that different investor needs and desired risk/reward profiles can be accommodated. The CLO structure thus combines stable funding, differentiated risk profiles for different investor needs, and the benefits of an active and independent asset manager.

Critically, neither the pooling of loans funded by securities, nor the use of tranching – which CLOs have in common with RMBS and many other securitization models – creates the moral hazard concerns that are directly motivating risk retention policies. Both the managers of CLOs and their investors can and do “look through” the pool-level risks to make credit judgments about individual borrowers – informed by ongoing borrower-level information and price signals that are widely available. For example, potential and current CLO investors can use such information to inform their ongoing decisions about how much to allocate to the overall asset class, which CLOs and CLO managers to place funds with, and whether to buy, hold, or sell specific CLO notes. This transparency marks a stark contrast to the securitization models that Congress and regulatory policymakers have sought to remediate.

Overall, the purpose of risk retention is to better align instances where those that make key credit decisions about specific borrowers are not those that bear the risk from those decisions. There is little evidence to support the claim that such moral hazard problems are a significant concern in the case of CLOs.

3.1. CLO managers as risk retainer

The NPR argues that CLO managers are an appropriate party to meet risk retention requirements by holding, via an investment on their own balance sheet, a 5% portion of the CLO assets they manage. Without respect to any argument regarding legal or statutory interpretation, this line of reasoning in the NPR appears to ignore basic institutional and economic facts. Most critically, it conflates the balance sheet model that defines banks and other lending institutions with the “client funds” model found in the asset management industry.

A CLO manager is not a financial intermediary that has a balance sheet of its own, but a fee-for-service agent acting on behalf of its investor stakeholders. It has the same basic business, legal, and organizational model – based around managing client funds – as both mutual fund managers and hedge fund managers. Such managers are paid fees by end investors in return for their expertise and diligence in selecting specific investments (within a specified class of assets). They do not need or use substantial funding or capital themselves. From a functional role perspective, CLO managers are a poor and illogical fit for bearing risk retention requirements.

CLO managers could only hope to meet the risk retention requirement as proposed by relying on an affiliated firm – one with a significant balance sheet – to buy and hold the required 5% of the managed CLO. This would likely rule out even many large asset management firms, as these are legally and practically premised on managing client funds, not commingled assets on the management firm’s own balance sheet. Bank affiliates would have their own balance sheet, but the capital treatment under Basel 3 rules is likely to be punitive for any retained 5% exposure to a CLO.

Insurance companies may be the most plausible affiliate to retain risk on behalf of a CLO manager. Even for these firms, such issues as the risk of triggering accounting consolidation of the entire CLO may complicate any significant risk retention. Finally, the requirement that the affiliate retain the CLO risk position subject to the proposal’s (very restrictive) limitations on hedging or selling the exposure would introduce an additional hurdle, as the affiliate’s management would need to get comfortable with such a commitment on an operational, prudential, and regulatory basis.

3.2. Leveraged loan lead arrangers as risk retainer

The re-proposed rule recognizes that many CLO managers may not be capable of retaining risk, and also recognizes that introducing such a requirement would likely lead

to a concentration of this activity among managers affiliated with large, balance-sheet-oriented financial institutions.

To address these concerns, the re-proposal also introduces a new alternative risk retention rubric for CLOs based on their investing only in a new class of leveraged loan tranches that are designated as “CLO eligible.” To create a CLO-eligible institutional loan tranche, the lead arranger of the overall leveraged loan must at the time of origination opt to hold 5% of the face value of the CLO-eligible tranche, and to retain this per the general restrictions on selling or hedging the retained risk.

Thus, CLO-eligible tranches as envisioned in the proposed rule, will

- Necessarily be more expensive to the borrower than non-CLO credit sources (to pay the arranger for the cost of the retained risk)
- Also impose multi-year burdens on the balance sheet and management of the lead arranger

Will lead arranger banks opt into long-term risk retention commitments as outlined in the proposed rule? We find it unlikely that they will elect to do so in substantial volumes, as the associated economic drag would come with very uncertain benefits, because of the coordination problems between lead arrangers and CLO managers looking to make use of the lead arranger risk retention option. Even if some lead arrangers opted to retain risk to make CLO eligible tranches available, there would be no way for a CLO manager to depend on there being sufficient number and variety of such tranches to establish a viable CLO. Conversely, lead arrangers may hesitate to retain risk because of the uncertainty of whether sufficient CLOs would buy the CLO-eligible tranche to justify the retained risk.

Thus, even if there were in principle enough of a net economic benefit for lead arrangers to justify the added cost and burden of risk retention, there is likely to be a coordination problem between lead arrangers and potential CLO managers, preventing CLO formation under this alternative risk retention option.

4. Assessment of effects of rule as re-proposed

In this section, we assess the potential impact of the risk retention rules as re-proposed on the availability, cost, and quality of credit for affected corporate borrowers. Our assessment of the proposed rule’s potential effects is based on the following assumptions:

- Lead arrangers will not provide “CLO-eligible loan tranches” in sufficient number and variety for CLOs to be formed to invest in such assets (for the reasons we discuss above in Section 3.2)

- Most CLO managers will not be willing or able to hold, on their own balance sheets, 5% of the asset value of the CLOs they would otherwise serve as the investment manager for, ultimately leading to a substantial reduction in the overall level of CLO assets providing credit to leveraged loan borrowers
- This long-term reduction of credit provision by CLOs would be partially made up for by other (non-CLO) credit providers, such as loan mutual funds, hedge funds, and high-yield bond investors – such substitution however will come at an increased cost to borrowers

Given the natural ebb and flow of volumes across the credit cycle, as well as the complex interplay of supply and demand across complementary credit channels, we do not attempt to predict precise effects of the rule. Instead, we focus our analysis on developing a range of plausible scenarios consistent with the assumptions above.

4.1. Reduction in provision of credit by CLOs

As the primary basis for assessing the overall loss of capacity by the CLO market to provide credit, we reviewed the top 30 CLO managers and classified each as affiliated with a large investment management group, a bank, an insurer, or as not affiliated with a larger financial institution or market participant. Based on the size and scope of the affiliated groups' businesses, we estimate that among these top 30 managers, approximately 10 managers could feasibly hold 5% of their existing CLO assets under management on their own balance sheets; these would primarily be those affiliated with a large insurer and or a very large alternative asset manager. We estimate that these 10 managers represent approximately 27% of the current CLO assets under management. We use this estimate to anchor our baseline scenario as involving a 75% reduction in credit provided by CLOs over the long term.

While we believe this small group of current CLO managers could feasibly retain risk as outlined in the current proposal through an affiliate, it is not obvious that they would choose to do so at unchanged levels, given the additional economic, managerial, and operational burden of the required risk retention. This would suggest that the long-term reduction in credit provided by CLOs could be higher than envisaged in our baseline scenario. We therefore also consider a more severe scenario of a 90% reduction in credit provided by CLOs.

On the other hand, the exit of a large number of their competitors could allow the remaining CLO managers to benefit from additional pricing power (over both management fees and actual loans purchased for investment), operational efficiency, and general returns to scale. This would suggest that some CLO managers could actually expand their footprint (in terms of CLOs managed and overall CLO assets under management). The net effect would in this instance be consolidation within the business of providing CLO management services. We therefore also consider a scenario that involves a 60% long-term reduction in the level of credit provided by CLOs.

(This would imply that the typical remaining CLO manager expands its absolute book of business by about 60%, a substantial increase.)

Overall, we consider scenarios in which the amount of credit provided by CLOs is reduced by 60%, 75%, and 90% in the long-term, as summarized in the table below.

Scenario	Reduction in credit provided by CLOs (in current market terms)
60% loss of CLO capacity	\$170 BN
75% loss of CLO capacity (baseline)	\$210 BN
90% loss of CLO capacity	\$250 BN

While all of these scenarios involve major reductions in the overall capacity and size of the CLO market, the plausibility of such outcomes is also supported by other evidence. For example, in 2009 and 2010, in the wake of the crisis, there was a major pullback in the appetite for higher-risk, higher-return investments in the credit markets. As a result, virtually all CLOs formed in this period involved the CLO managers contributing the entire equity portion of the CLO's liability structure.⁶ In 2009, when CLO managers had to provide all of the equity for their CLOs, the volume of newly formed CLOs dropped to approximately 2% of what had been formed in 2004, and were only about 1% of the 2012 volume. In the more stabilized market of 2010, CLO formation volumes were 14% of the 2004 volumes (and less than 8% of 2012 volumes).⁷ Our reduction scenarios are consistent with such figures, as well as with the views of CLO managers themselves on the potential impact of the proposed risk retention rule.⁸

In the current non-IG market, CLOs provide approximately \$280 BN of credit to non-IG borrowers (or approximately 13% of the total stock of non-IG credit of \$2.2 TN). Applied to the current market, our scenarios would represent a loss of \$170 to \$250 BN in credit provided by CLOs.

Can't investors in CLOs simply find another way to lend to non-IG borrowers?

Given the general flexibility of markets and the power of market forces, it is worth considering carefully why the loss of CLOs as a specific investment vehicle would mean the loss of actual investment sources. In other words, why wouldn't the credit markets adjust to the loss of CLOs as a major source of leveraged loan financing, by re-aligning

⁶ Generally, the equity was contributed by another fund affiliated with or managed by the CLO manager.

⁷ Oliver Wyman analysis of publicly available data and proprietary data provided by broker-dealers

⁸ See for example the survey of CLO managers conducted by the LSTA, in which more than 70% of CLO managers concluded that the CLO market could shrink by 75%. This survey result pre-dated the release of the latest proposed rule, and may overstate the number of CLO managers who believe they could continue to form new CLOs under the rules as re-proposed.

funding flows over time to provide that credit at essentially the same level of pricing to borrowers? If this did occur, only the nature of the investment structure, but not the ultimate source of funds might shift, and so the overall impact on the price of credit might be muted. However, the only obvious way to achieve such an outcome would be for existing end-investors in CLOs to re-direct substantially all of their CLO investments to other non-IG investment vehicles, or to direct investment in non-IG loans or bonds.

We view such an outcome as very unlikely, because of the specific investment objectives of the investors that provide the majority of investment funds for CLOs: global banks. As shown in the distribution of CLO holdings among investors in Exhibit 4, foreign and US banks provide over half of the total investment in CLOs, concentrated in the lowest-risk parts of the investment structure. Although making loans to a wide range of corporate and commercial firms is a core banking function, banks that purchase CLO securities generally do so for their investment portfolio. Most banks maintain a (relatively small) part of their assets in an investment portfolio of low-risk bonds, as these can be bought and sold as needed to maintain an appropriate asset-liability profile.

Bank investment portfolios thus tend to invest only in securities that meet a specific risk and liquidity profile – in fact, US banking regulation requires that banks hold only “investment grade” securities in their portfolios. Leveraged loans themselves, and alternative means of investing in diversified pools of leveraged loans, would not serve the same asset-liability management purpose as low-risk securities. Banks that invest in lower-risk CLO tranches would find it challenging to continue providing credit to non-IG corporate borrowers through other, non-CLO channels. Therefore, the loss of CLO capacity will likely mean a permanent diminishment of a significant source of funds – the investment portfolios of global banks.⁹

We conclude that replacement credit for non-IG borrowers will need to come from non-CLO (and non-CLO-investor) sources. More broadly, one of the unique economic roles of CLOs is to expand the available base of credit providers in leveraged loans to those who would not otherwise invest in this asset class directly (whether due to lack of loan management capabilities, mismatch of desired risk profile, or other reasons). Remaining providers of non-IG corporate credit will need to be compensated with a higher rate of return to increase their own allocation to this asset class.

4.2. Potential increased costs for borrowers

Below, we consider two sources of credit for non-IG corporate borrowers that could potentially expand their own credit provision to replace lost CLO capacity, and plausible

⁹ Comparable institutional constraints (often operating below the level of a single firm) would in many cases similarly constrain insurers and other investors from shifting from investing via CLOs to other non-IG vehicles.

levels of increased credit costs for borrowers that would be associated with such replacement.

Cost to borrowers of replacing lost CLO credit capacity – other leveraged loan credit providers

Today, CLOs provide nearly half of the \$640 BN of the credit that the institutional leveraged loan market channels to non-IG borrowers. Non-CLO providers of credit in the institutional leveraged loan market include hedge funds, similar alternative investment vehicles focused on credit assets, loan mutual funds, and insurance companies. The critical questions to consider are:

- 1) How much additional credit might such sources provide, if CLO capacity is diminished?
- 2) How much “extra” yield would be needed to induce these non-CLO loan buyers to increase the amount of credit they are willing to supply?

Basic economic logic suggests that the answer to question #1 (about quantity of credit supplied) will be linked to the answer to question #2 (about price of credit supplied). The more borrowers pay in interest costs, the more credit providers will be willing to extend to them. This relationship is usually described by the price elasticity of supply. A supply elasticity of (for example) 0.5 means that if prices go up by 10%, then the quantity supplied will go up by $0.5 * 10\%$, or 5%. In general, the less elastic a market is, the more prices will need to change to correspond to a given change in volume.

To give a more concrete instance, we consider the increase in credit quantity that non-CLO leveraged loan credit providers would have to supply to fully replace lost CLO capacity. (We view complete replacement of the \$210 BN of credit capacity represented in our baseline CLO reduction scenario to be unlikely. However, full replacement does provide a useful conceptual anchor to reason about the potential for increased borrower costs at any level of replacement credit.) To fully replace the lost credit capacity in our baseline CLO reduction scenario of 75%, today's non-CLO leveraged loan credit providers would need to expand their holdings by approximately 60%. Replacement of half of the lost CLO capacity would involve expanding their supply of credit by approximately 30%.

Given an estimate of the elasticity of the credit supply for non-CLO credit providers in the leveraged loan market, we could calculate how much spreads would need to increase to attract that level of increased investment. Unfortunately, price elasticity of supply is very difficult to estimate robustly, and remains an under-explored area in the

research literature. Recent empirical work by Greg Nini is among the most relevant, though it looks at the elasticity of credit demand, rather than supply.¹⁰

Even without robust estimates of market-wide credit supply elasticities, we can use this framework to test plausible elasticity values and thereby get a sense of the potential impact on borrower spreads.

In the table below, we show how a given demand elasticity would translate into an estimate for the required increase in yield. We show two elasticity values: a lower elasticity value of 0.8, and a higher value of 2.0.

	Assumption of less elastic credit supply	Assumption of more elastic credit supply
% increase in credit supply from non-CLO leveraged loan buyers to fully replace lost CLO capacity	+ 60%	+ 60%
Assumed supply elasticity	0.8	2.0
Corresponding % change in credit spreads	+ 73%	+ 29%
Baseline credit spread	400 bps	400 bps
New spread needed	692 bps	517 bps
Required change in credit spreads	+ 292 bps	+ 117 bps

Focusing on the more conservative assumption shown above, if leveraged loan supply is elastic (= 2.0), then a 117 bps increase in spreads (on top of a typical market spread of 4%) would correspond to an increase in supply sufficient for full replacement of lost CLO capacity. Assumptions of lower elasticity values (such as the 0.8 shown, or the 0.6 found for demand elasticity by Nini) would magnify the associated increase in spreads paid by borrowers (to 2%, 3%, or more).

The analysis outlined above does not attempt to be precise in predicting long-term market changes, but we view it as indicative that the active participation of CLOs can have significant effects on the price of credit for non-IG borrowers. Given conservative assumptions on market elasticity, an increase in credit costs for borrowers on the order of 100 bps or more appears very plausible.

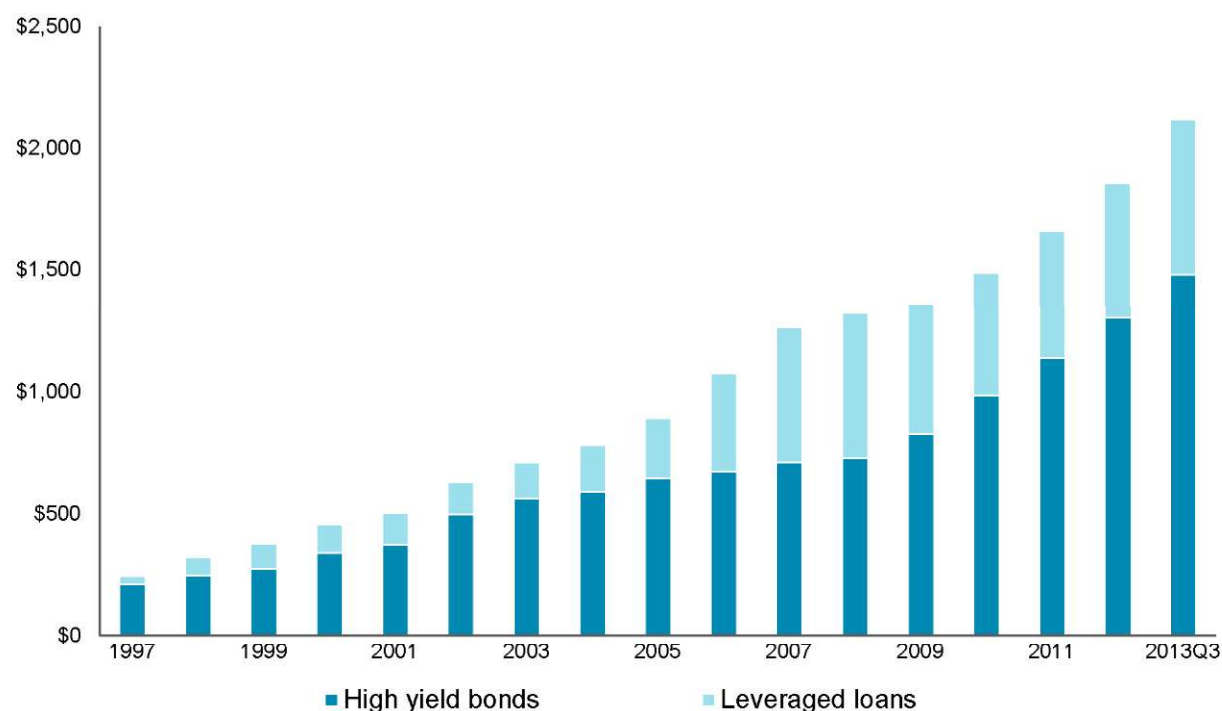
¹⁰ For example, see "What is Special about Bank Loans" (2012), available at http://warrington.ufl.edu/departments/fire/docs/seminar/2013Spring_GregNini.pdf

Based on data from 2001 to 2011, Nini estimates the "own-price" demand elasticity across the overall institutional term loan market to be -0.2 to -0.3. This means that (for example) a 10% increase in loan spreads (say, from 4.0% above 3-month LIBOR to 4.4%) would correspond to a 2-3% decrease in the net amount of institutional term loans borrowed. For non-IG corporate credit, the estimated demand elasticity is approximately -0.6, more than twice that found across all issuers included the study sample.

Cost to borrowers of replacing lost CLO credit capacity – high yield bond investors

Many (though far from all¹¹) non-IG borrowers have access to both leveraged loan and high yield bond financing. This makes high yield bonds an obvious potential source of replacement credit for some borrowers if CLO capacity was diminished. The US high yield bond market remains larger overall than the leveraged loan market, and during periods of growth (such as the late 1990s through 2003 and the post-crisis period after 2009) its annual increase in outstandings is comparable in scale (adjusted for market size) to the magnitude of lost credit capacity we discuss above.

Exhibit 7: Outstanding amounts of high yield bonds and institutional leveraged loans 1997-2013Q3 (\$BN)



Source: S&P/Capital IQ/LCD

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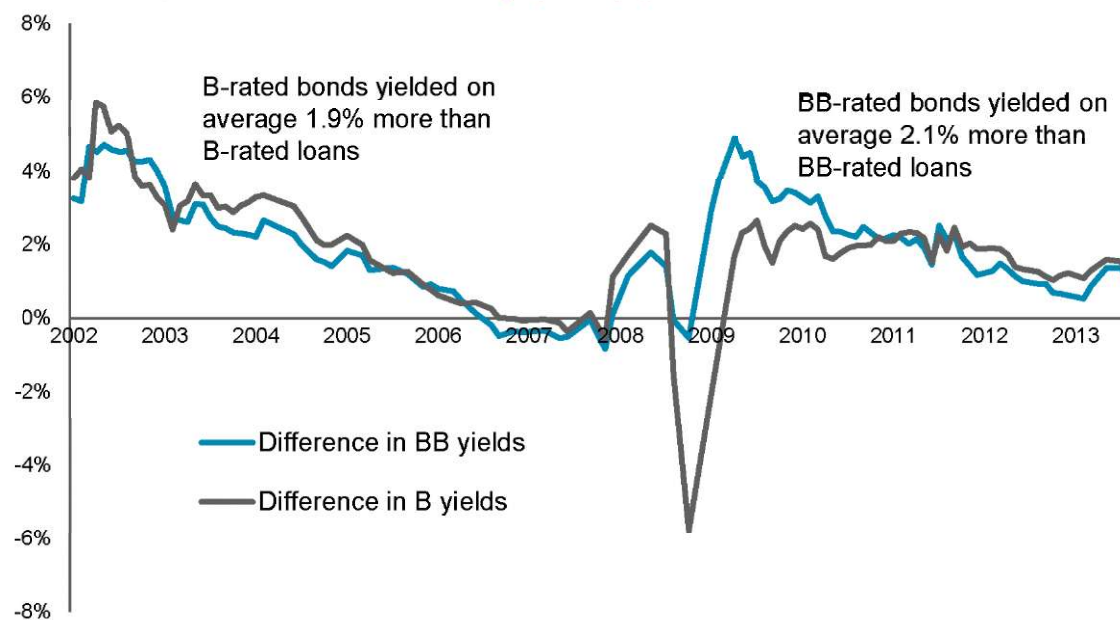
To the extent that borrowers can practically access additional high yield bond credit for any reduction in available loan financing, how much more would they likely pay in interest costs?

To get a sense of the potential increased costs, we compare market yields on similarly risk-rated leveraged loans and high yield bonds. The difference in yields is a close proxy

¹¹ For example, middle market borrowers are particularly constrained from issuing into the high yield bond market.

for the differences in interest rates a non-IG corporate borrower would pay for loan financing vs. bond financing.

Exhibit 8: Yield difference between same-rated high-yield bonds and leveraged loans
2002-2013Q3, Differences in market average yields (%)



Sources: Bank of America Merrill Lynch, S&P/Capital IQ/LCD

NYC-LSY00111-001

The difference in market yields for both BB- and B-rated bonds and loans have averaged approximately 2% since 2002.¹² While the yield difference is clearly influenced by changing market and economic conditions, the overall tendency for borrowers to pay higher average interest rates to borrow in the high yield bond market (vs. using leveraged loans) is linked to major institutional market features:

- High yields bonds are generally fixed-rate instruments, while leveraged loans are structured with floating interest rates. The difference in yields between high yield bonds and leveraged loans therefore includes a yield curve effect, resulting in higher interest costs in typical interest rate environments that have an upwardly sloping yield curve
- Leveraged loans are often secured and senior to bonds in the borrower's capital structure, and also include covenants that give loan creditors more rights and opportunities to intervene if a borrower experiences difficulty

¹² Excluding the period 2007-2009, when credit markets were experiencing significant turmoil, the average difference was 2.2% and 2.3% for BB- and B-rated instruments, respectively.

Given these structural differences, the average higher cost to borrow through the high-yield market is likely to persist and affect any replacement credit that comes through that channel. These structural effects would be in addition to any price elasticity effect, which would likely apply (though not necessarily to the same degree) as in the market for leveraged loans.

Baseline cost to borrowers across our CLO reduction scenarios

Based on the potential pricing effects discussed above, and using the more conservative assumptions discussed in each case, substantial replacement of lost CLO credit capacity could be associated with incremental yields of 1% or more (for leveraged loan credit providers) and 2% or more (for high yield bond investors). We therefore use 1.5% as a plausible estimate of the increase in yield that non-CLO credit providers would require to fully replace the lost CLO credit capacity in each scenario.

The potential implications for credit cost and availability across our scenarios are summarized below.

Scenario	Reduction in credit provided by CLOs (in current market terms)	Estimated additional cost to borrowers to replace lost CLO capacity¹³
60% loss of CLO capacity	\$170 BN	\$2.5 BN per year
75% loss of CLO capacity	\$210 BN	\$3.2 BN per year
90% loss of CLO capacity	\$250 BN	\$3.8 BN per year

¹³ We conservatively interpret the incremental yield estimates as marginal price changes applying only to the replaced quantity of credit, not average price changes applying to the entire market. If applied to the overall leveraged loan market, the increased cost to borrowers could exceed \$10 BN annually.

4.3. Quality and consistency of credit

Even if other credit sources can substitute for CLOs, such alternatives will tend to have less stable liability sources; as described above, CLOs are essentially loan funds with committed investment funds for a given size and period of investment. Other funds, such as loan mutual funds, may offer investors more ready access to investment funds but, correspondingly, may need to sell loan assets if investors withdraw significant amounts in a short time period.

Thus, any significant reduction in CLOs as leveraged loan market participants will take away a group of investors that can act as buyers when others need to sell, which could lead to systematically more volatile loan prices.¹⁴ More generally, by constraining credit providers to a more limited set of viable liability structures and operating models, a risk retention rule that does not fit the CLO market could inadvertently reduce the ecological diversity of the financial system, decreasing its ultimate resilience.

¹⁴ Compare to Governor Stein's remarks on February 7, 2013: "If relatively illiquid junk bonds or leveraged loans are held by open-end investment vehicles such as mutual funds or by exchange-traded funds (ETFs), and if investors in these vehicles seek to withdraw at the first sign of trouble, then this demandable equity will have the same fire-sale-generating properties as short-term debt." <http://www.federalreserve.gov/newsevents/speech/stein20130207a.htm>

5. Considerations for policymakers

The risk retention rules as envisioned by the Dodd-Frank Act do not fit the case of CLOs very well. In common with many other kinds of securitization, CLOs use the fundamental risk-sharing technologies of diversification of risks, pooling of investor funds, and risk transformation through tranching. However, the role played by CLOs in the leveraged loan market – a stable investment funding structure that provides credit on transparent terms to specific borrowers – does not have much else in common with the securitization models that have motivated the adoption of risk retention rules.

In our view, the risk retention implementation options proposed by the Agencies thus far for CLOs risk significant unintended consequences, including a reduction in the amount, and increase in the price of, credit available to non-IG investors.

Our primary recommendation to policymakers is to move cautiously. While the policy options proposed do not seem to fit this market well, there may yet be other ways to meet the letter and spirit of the risk retention requirements in the case of CLOs.

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