

Capturing the Illiquidity Premium*

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First version: February 2020. This version: February 2020

PRELIMINARY

Abstract

This paper studies the restructuring of financial intermediation in the United States since the 2007-09 financial crisis. We show that the largest U.S. life insurers have entered private debt markets as banks refocused on commercial banking, against a backdrop of unconventional monetary policies and tighter bank regulations. Through complex on- and off-balance sheet arrangements, these insurers, many of whom are controlled by private equity firms, are acquiring and deploying vast amounts of annuity capital to capture the illiquidity premium. The new architecture of the financial system features novel forms of lending. That said, life insurers have become more vulnerable to an aggregate shock to the corporate sector.

JEL CODES: G23, G12, G18

KEYWORDS: shadow banking, insurance companies, annuities, private debt, private equity, commercial real estate, leveraged loans, collateralized loan obligations

*All authors are in the Research and Statistics Division of the Federal Reserve Board. For providing valuable comments, we would like to thank, without implication, Celso Brunetti, Francesca Carapella, and Borghan Narajabad. The views in this paper are solely the authors' and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System or of any other person associated with the Federal Reserve System.

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Introduction

Financial intermediation reflects the incentive structure of the financial system. Seminal work views financial intermediaries as performing a “delegated monitoring” role, sharing monitoring costs among a large pool of individual lenders—e.g., Townsend (1979), Diamond (1984), Boyd & Prescott (1986) and Williamson (1986). According to this view, debt contracts on both sides of the financial intermediary give lenders power over borrowers and give borrowers an incentive to repay the debt. These debt contracts can, under some conditions, align the incentives between asymmetrically-informed borrowers and a financial intermediary and between the financial intermediary and its own creditors.

When a restructuring of the financial system changes the types of contracts between borrowers and lenders, the incentive of the financial intermediary to screen borrowers and monitor loans is likely to change as well. The U.S. financial system is experiencing a dramatic restructuring since the 2007-09 financial crisis, in response to a radical overhaul of banking regulations and protracted low interest rates in advanced economies. A large number of life insurers and corporations are discarding blocks of capital-intensive long-term liabilities, such as annuities and defined benefit plans, as they struggle to find long-term assets with yields high enough to fund those liabilities. Some of the largest U.S. life insurers and private equity firms are exploiting the dislocation in the annuity markets. These institutions redeploy the relatively stable source of long-term annuity capital to capture the illiquidity premium created by banks exiting corporate lending. Within ten years, the U.S. life insurance industry has grown into one of the largest private debt investor in the world. One less-understood effect of these sea changes in the financial system is on the incentives of financial intermediaries to screen borrowers and monitor loans to corporations. The role of annuity capital in funding corporate lending has grown dramatically. Importantly, the control of annuitants over life insurers is much weaker than the control of bank depositors over banks.

In this paper, we document in exhaustive detail the development by some U.S. life insurers of a new business model designed to originate and invest in private debt. We describe and precisely measure the growth in on- and off-balance sheet transactions that life insurers use to develop their private debt businesses. On the liabilities side of the balance sheet, retail and institutional annuity capital has grown by about \$1 trillion since the financial crisis. This capital funds on- and off-balance sheet assets amounting to close to \$500 billion in private real estate and \$200 billion in private credit. These risky assets are thinly-traded and compensate their holders with a return that includes an illiquidity premium.

In the years following the financial crisis, U.S. life insurers developed a new organizational

structure combining three entities to capture the illiquidity premium. First, the life insurer itself is essential as a source of relatively low-cost and long-duration insurance liabilities, such as annuities. Second, the insurer establishes unauthorized captive reinsurers in Bermuda to lower the capital cost of providing traditional insurance products. The free capital can be deployed to finance additional investments by the insurance company. Third, an asset manager in the organization originates private debt financed wholly or in part by the insurer’s newly-released capital. The combination of these entities’ operations is a new business model that allows these life insurers to fill the gap left behind by banks exiting corporate lending markets.

We study detailed data—laboriously constructed from statutory filings—on these life insurers’ new business model. We carefully parse the organizational structure of more than 1,000 life insurers to identify the institutions that have restructured their businesses specifically to target private debt markets. We establish who holds the controlling stake of these insurance companies, determine the asset manager in their organizational structures, and calculate the ownership shares of risk retention vehicles facilitating off-balance sheet investment in private debt, notably CLOs. Having identified those life insurers with private debt businesses, we document rapid growth in their particular insurance liabilities and general account assets. We show that they are growing their businesses by exploiting dislocated annuity markets and tapping wholesale funding markets for additional funding using nontraditional insurance liabilities. We describe how the life insurers that have adopted the private debt business model are originating loans to private real estate as well as originating, warehousing, and securitizing loans to highly-leveraged corporations. By extending credit to these risky projects the insurers earn a spread over their stable funding.

Our findings reveal important details about the post-crisis trend of nonbanks replacing banks in the provision of credit to corporations. During this period, banks shifted their activity away from investment banking financed by wholesale funding towards commercial banking financed by deposit funding, with striking increases in their holdings of safe assets (BIS 2018). Irani, Iyer, Meisenzahl & Peydro (2018) find an empirical connection between tighter bank regulation and the migration of credit from banks to nonbanks.¹ We show precisely how the largest U.S. life insurers restructured their organizations to expand into new business activities. We document the growth in private debt originations facilitated by their asset manager affiliates. We use security-level data from statutory filings—particularly Schedules BA and B—to gauge the exposure of these life insurers to risky corporate borrowers over and above the fixed income

¹ To be sure, nonbank activity is also fueled by investors’ demand for higher-yielding debt securities. Their demand in the post-crisis period was driven in part by the low interest rate environment created by unconventional monetary policies.

security holdings reported in Schedule D. We find evidence that these life insurance companies hold some of the riskiest portions of the CLOs issued by their own affiliate asset managers.

One result of our extraordinary data effort is a grainy image of a potential vulnerability in the financial system (Eichner, Kohn & Palumbo 2013). Our analysis suggests life insurers are exposed in opaque ways to aggregate shocks in the corporate sector. The connections we measure between life insurers, captive reinsurers, and asset managers provide a framework for testing the resilience of the insurance industry, and the financial system more broadly, to direct and indirect shocks to the corporate sector. Importantly, these tests focus on tail risks and complement the existing insurance regulators' capital adequacy assessments based on moderately adverse conditions (AAA 2014). For example, a widespread default or downgrade of risky corporate debt could force life insurers to assume balance sheet losses of their CLO-issuing affiliates, wiping out their equity. In a worst-case scenario, the perception of balance sheet weakness could incite liquidity-sensitive institutional investors to withdraw from those life insurers. Those additional cash needs would likely squeeze insurers' cash flows (Foley-Fisher, Narajabad & Verani 2019). As we saw during the financial crisis, U.S. life insurers may require government support to prevent shocks from being amplified and transmitted to the household sector (Foley-Fisher, Narajabad & Verani 2015).

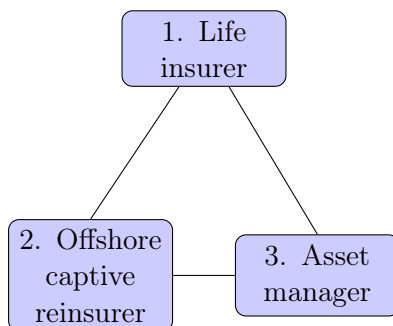
The remainder of this paper contains four sections. In Section 1 we describe the new organizational structure of life insurers used to invest in private debt. In Sections 2 and 3 we document patterns in these new financial entities' liabilities and assets, respectively. We offer some concluding remarks in Section 4.

1 Structure of life insurers with private debt business models

The private debt businesses of life insurers require an innovative type of organization. The new organization structure comprises three distinct entities, as stylized in Figure 1. First, a life insurer develops capital for their private debt business by building a block of annuity business. While selling new annuity contracts is one way to develop this insurance business, it need not be originated from scratch. Rather, the block of annuities can be acquired through the purchase of an insurance company, a reinsurance transaction, or a pension buy-out. While interest rates have remained low since the financial crisis, other insurers and private corporations have made such blocks of business available to purchasers at favorable prices. Large life insurers also develop capital for their private debt businesses by issuing non-traditional liabilities to institutional investors. These liabilities include funding agreement-backed securities (FABS) and FHLB advances, as well as securities lending and repo. We will describe these liabilities in

more detail in Section 2.

Figure 1: A stylized diagram of three entities that form the core organization structure of insurers with private debt business models. A life insurer (1.) establishes a block of traditional insurance business. They cede the insurance business to an offshore captive reinsurer e.g. in Bermuda (2.) and free up capital. The insurer uses the excess capital to support the activities of an asset manager (3.) that focus on investing in private credit. The combined business model transforms loans to highly-leveraged firms into higher-yield debt securities, capturing the illiquidity premium.



Second, the life insurer sets up at least one offshore captive reinsurer, often in Bermuda. By ceding its insurance liabilities to the captive reinsurer, the life insurer frees up annuity capital for redeployment to its private debt business. Koijen & Yogo (2016) describe the details of alternative structures for captive reinsurers. Table 1 provides several examples of life insurers that have established offshore captive reinsurers in Bermuda as part of their organizational structure. Every Bermuda reinsurer listed in Table 1 was formed after 2012. Bermuda was approved by the NAIC as a “Qualified Jurisdiction” for reinsurance collateral reduction in January 1, 2015. The NAIC invited the Bermuda Monetary Authority to participate in an “expedited review” in August 2013. During the expedited review process, the NAIC issued a public notice on its website requesting interested parties to submit public comments and received a single letter from the Association of Bermuda Insurers and Reinsurers (ABIR), which represents “the public policy interests of Bermuda’s international insurers and reinsurers that protect consumers around the world.” ABIR members include, among others, AIG and AXA, which appear in Table 1.

The third entity in the triangle is an asset manager that originates, acquires and manage private debt. By deploying its annuity capital to private debt, the life insurer earns a spread that includes an illiquidity premium. We will show in Section 3 how life insurers structure their private debt holdings both on-balance sheet with other assets and in complex off-balance sheet arrangements.

Table 1: Examples of triangular organizational structures designed for private debt business models. Source: Bermuda Monetary Authority and NAIC Statutory Filings.

(1.) U.S. Life insurer	(2.) Offshore captive reinsurer	(3.) Asset manager
AIG	AIG Life of Bermuda	AIG Asset Management
Allianz US	Allianz Re Bermuda Life	PIMCO
Athene	Athene Life Re (Bermuda)	Athene Asset Management
Genworth	Genworth Life and Annuity Ins. Co (Bermuda)	AssetMark
Guggenheim Life	Delaware Life Ins. and Annuity Co. (Bermuda)	Guggenheim Partners
Global Atlantic	Global Atlantic (Bermuda)	Goldman Sachs Asset Management
Legal & General America	Legal and General Reinsurance Co. (Bermuda)	Legal & General Investment Management America
MetLife	MetLife Reassurance Company of Bermuda	MetLife Investment Management
Aegon US	Transamerica Life (Bermuda)	Aegon Asset Management
AXA US	XL Bermuda	AXA Investment Managers
Nassau Life	Nassau Re (Cayman Islands)	Nassau Corporate Credit, Nassau CorAmerica

1.1 Private equity firms buy life insurers to support private debt investment

The new triangular organizational structure has been adopted widely. Some large incumbent U.S. life insurers, such as MetLife, have created their organizations by developing in-house asset managers. Some other insurers acquired an existing asset manager. Table 2 shows a sample of asset managers acquired by life insurers. Lastly some incumbent insurers both developed their own in-house asset manager and acquired an existing asset manager. For example, AIG developed AIG Asset Management in-house and acquired Covenant Credit Partners in 2018.

Table 2: Asset managers acquired by life insurers.

Year	Insurer	Target
2000	Allianz	PIMCO
2005	Mass Mutual*	Baring Asset Management
2006	Principal Financial Group	WM Advisors
2007	Great West Life Group	Putnam Investments
2010	Ameriprise Financial	Columbia Management
2013	Athene	MidCap Financial
2014	TIAA	Nuveen Investments
2018	AIG	Covenant Credit Partners
2019	Eldridge	Maranon Capital
	Eldridge	Chain Bridge Asset Management

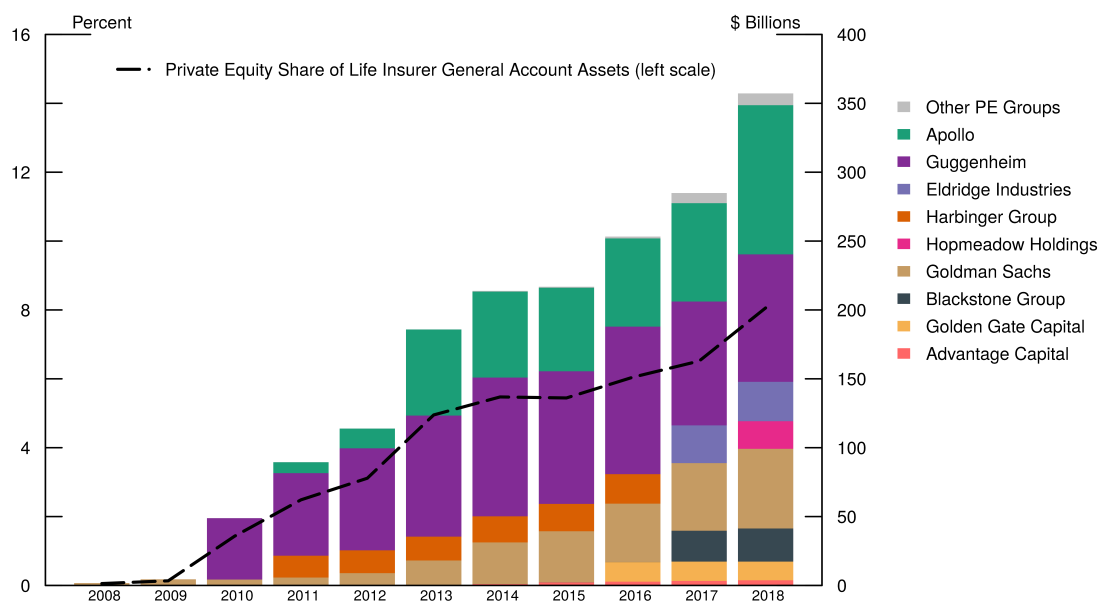
Note: *Mass Mutual rolled four asset managers into one.

In addition to industry incumbents, asset managers, particularly private equity (PE) firms, are using the new triangular organizational structure to scale up their private debt businesses. These institutions create their organizations by acquiring a suitable existing life insurance company and then establishing an offshore captive reinsurer. Figure 2 shows the rapid growth of life insurers controlled by PE firms. Starting from virtually nothing in 2008, PE firms now control roughly 8 percent of U.S. life insurance industry general account assets, equivalent to more than \$350 billion.

1.2 Case studies

We provide two detailed examples of private debt businesses established by life insurers. We show how the triangular organization structure underpins their new businesses. The examples illustrate how U.S. insurers create on- and off-balance sheet structures as part of their private debt businesses. We also describe the assets and liabilities used in these businesses.

Figure 2: U.S. life insurer general account assets controlled by private equity firms. The bars in this chart show the dollar value of life insurers' general account assets that are controlled by the private equity firms listed on the right of the chart. The dashed line shows the total amount of these assets as a percentage of the entire life insurance industry's general account assets. Source: NAIC Statutory Filings.

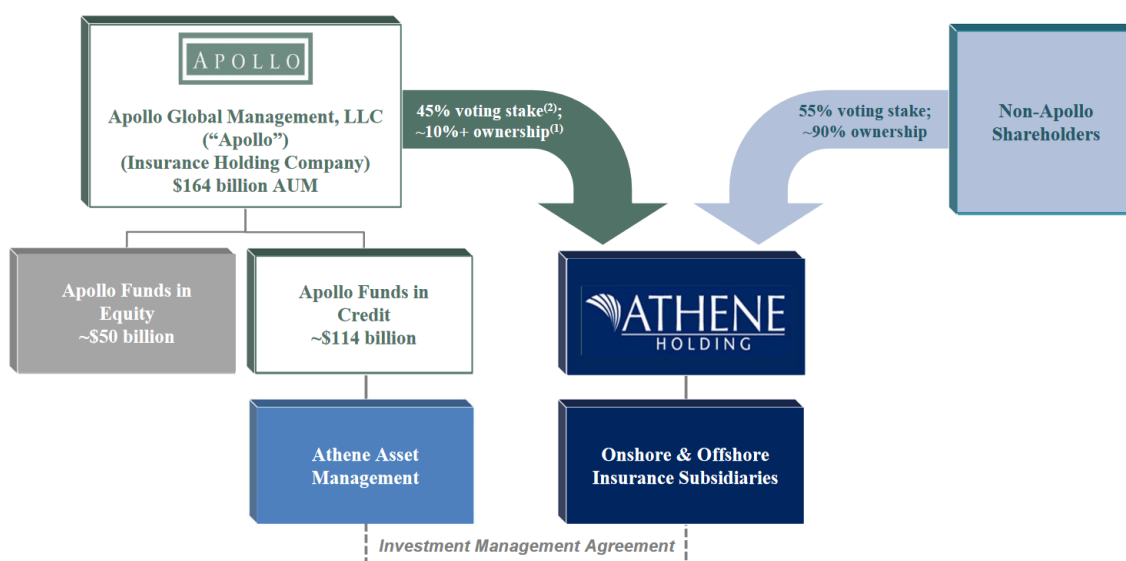


Source: Staff estimates based on data from the NAIC Annual Statutory Filings. Data are current as of 2018Q4.

1.2.1 Apollo-Athene

Figure 3 shows the organizational structure of Apollo-Athene. The organization’s insurance subsidiaries are grouped under the parent company, Athene Holding, incorporated in Bermuda. The U.S.-based life insurers’ liabilities are predominantly fixed annuities. The captive reinsurers used by Athene are within the set of “Onshore and Offshore Insurance Subsidiaries,” including Athene Annuity Re Ltd and Athene Life Re Ltd, both of which are also located in Bermuda. The relationship between the Athene and its affiliated asset manager, Apollo, is strategic. As of 2014, Apollo owned about 10 percent of Athene with a 45 percent voting stake.² Apollo provides investment management services to Athene through several subsidiaries, most notably Athene Asset Management. In addition, Apollo originates private debt in several markets, including middle market leveraged lending through its MidCap subsidiary, located in Maryland.³

Figure 3: The organization structure of Apollo-Athene. This figure shows the strategic relationship between the insurance subsidiaries under Athene Holding Ltd and its affiliated asset manager, Apollo Global Management LLC. The captive reinsurers used by Athene are within the set of “Onshore and Offshore Insurance Subsidiaries,” including Athene Annuity Re Ltd and Athene Life Re Ltd, both of which are also located in Bermuda. Source: Apollo Global Management LLC 2014 Investor Day Presentation.



As part of its private debt business, Apollo-Athene established in 2016 a capitalized manager vehicle (CMV) called Redding Ridge to satisfy CLO risk retention rules in the U.S. and the European Union (FitchRatings 2019). Both Apollo and Athene have ownership stakes in Redding Ridge. According to its most recent statutory filing, Athene holds \$30 million in equity issued

² According to Athene Holding’s 10K regulatory filing with the SEC in 2018, page 9, Apollo retains and is expected to retain a 45 percent voting stake.

³ See page 23 of Apollo’s Investor Presentation, February 2018.

by Redding Ridge.⁴ Redding Ridge issued its first risk retention-compliant dollar-denominated CLO in 2017 and its first euro-denominated CLO in 2019. As of 2019 year-end, Redding Ridge issued about \$10 billion in US and Euro CLOs.

1.2.2 MetLife

Figure 4 shows the current structure of MetLife’s private debt origination business under its in-house asset manager MetLife Investment Management (MIM), created in 2012.⁵ The business is roughly equally split between private credit and private real estate. Through MIM, MetLife originated “\$14.7 billion in private debt in 2018 across its corporate private placements and infrastructure platforms” and \$12.9 billion in commercial mortgage loans.⁶ As of yearend 2018, MetLife managed \$65 billion in commercial mortgage loans, \$18.4 billion in agricultural mortgage loans, and \$52.3 billion in corporate private credit.

At the same time that it created MIM, MetLife spun off its capital-intensive business lines and made its captive reinsurance more opaque. First, in 2014 the insurer moved three of its life insurance companies and a Bermuda captive reinsurer called Exeter Re to a new company called Brighthouse Financial. By 2017, Brighthouse Financial was fully separated from MetLife. The New York State Department of Financial Services praised the company for moving the offshore captive reinsurer back to the United States.⁷ MetLife then created a new offshore captive, MetLife Reinsurance Company of Bermuda, as a wholly-owned subsidiary of MetLife Global Holding Company II GmbH, a Swiss-domiciled holding company that is itself a wholly-owned subsidiary of MetLife, Inc. This transaction, however, did not make the news.

We generalize these case studies to the rest of the life insurance industry. We carefully

⁴ Apollo Global Management’s stake is acknowledged in this press release: <https://www.businesswire.com/news/home/20170803006213/en/Redding-Ridge-Asset-Management-Announces-Closing-700>

⁵ MetLife’s transformation from one of the largest life insurers in the U.S. to one of the largest private debt originators began at around the same time that the company was designated as a non-bank systemically important financial institution by the Financial Stability Oversight Council. For details, see appendix A.

⁶ <https://investments.metlife.com/borrowers-issuers/>

⁷ Benjamin M. Lawsky, the then New York State Department of Financial Services superintendent at the time, had voiced his concern about offshore captive reinsurance, referring to the activity as “shadow insurance.” MetLife announced that it was redomesticating Exeter Re “to better position the company to comply with Dodd-Frank collateral requirements, proactively address regulatory issues surrounding the use of captive reinsurance companies, and improve the risk profile and transparency of MetLife’s U.S. variable annuity business”. See MetLife press release, “MetLife Completes Merger of Three Life Insurance Companies and One Former Offshore Reinsurance Subsidiary” (November 17, 2014), available at <https://www.metlife.com/about/pressroom/index.html?compID=150359> and coverage of Lawsky’s reaction to the MetLife announcement <https://insurancenewsnet.com/oarticle/Statement-of-Superintendent-Benjamin-M-Lawsky-on-Metlifes-Decision-to-Move-Off-a-382325>

MetLife has acted wisely in bringing this subsidiary back to the United States where it will be subject to stronger rules and oversight. The company’s decision represents a step in the right direction as we seek to address the risks created by the shadowy world of ‘captive’ reinsurance. These captive reinsurance arrangements – which we call shadow insurance – are all too often parked offshore or in other lightly regulated jurisdictions where they are insufficiently understood and monitored.

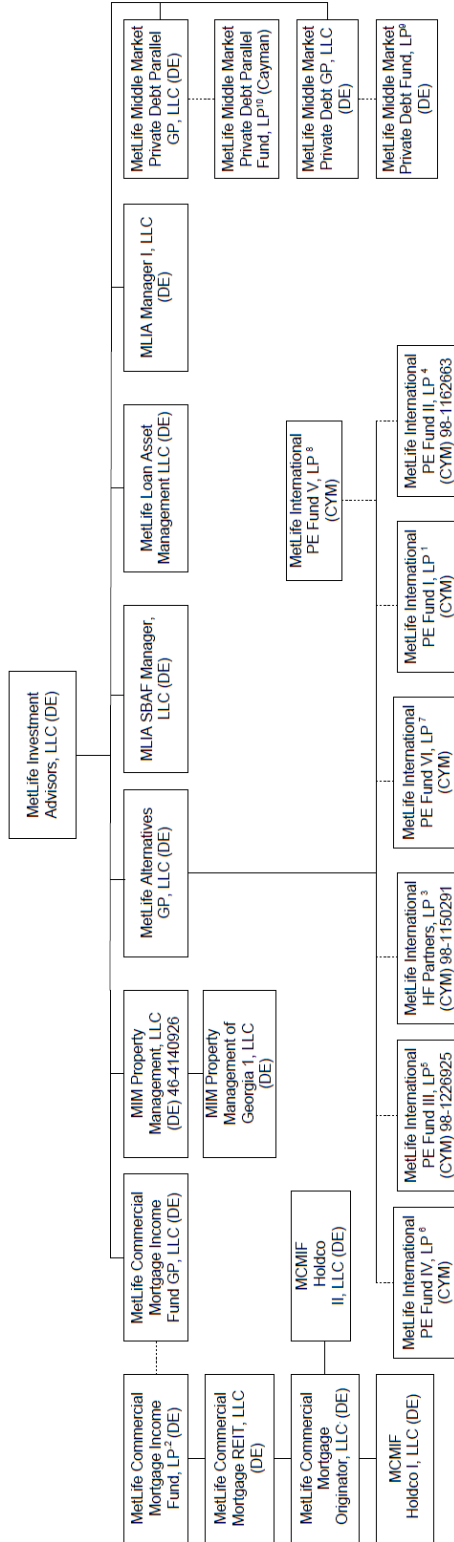
Figure 4: MetLife Private Debt Origination Business in 2018. Source: NAIC Annual Statutory Filings.

Annual Statement for the year 2018 of the **Metropolitan Life Insurance Company**

SCHEDULE Y - INFORMATION CONCERNING ACTIVITIES OF INSURER MEMBERS OF A HOLDING COMPANY GROUP

PART 1 - ORGANIZATIONAL CHART

F



1 92.553% of the Limited Partnership interests of this entity is owned by MetLife Insurance K.K. (Japan). 4.115% is owned by MetLife Mexico S.A., 2.716% by MetLife Limited (Hong Kong) and the remaining 0.576% is owned by Metropolitan Life Insurance Company of Hong Kong Limited.
 2 MetLife Commercial Mortgage Income Fund GP, LLC is the general partner of MetLife Commercial Mortgage Income Fund, LP (the "Fund"). A majority of the limited partnership interests in the Fund are held by third parties. The following affiliates hold limited partnership interests in the Fund: Metropolitan Life Insurance Company owns 26.6%, MetLife Insurance Company of Korea, Limited, owns 2.1%, MetLife Limited owns 2.7%, Metropolitan Life Insurance Company of Hong Kong Limited owns 0.03% and Metropolitan TowerLife Insurance Company owns 2.7% (the remainder is held by third party investors).
 3 88.22% of the Limited Partnership interests of this entity is owned by MetLife Insurance K.K. (Japan). 9.47% is owned by MetLife Insurance Company of Korea Limited, 2.29% is owned by MetLife Limited (Hong Kong) and 0.02% is owned by MetLife Alternatives, GP.
 4 94.34% of the limited partnership interest of MetLife International PE Fund II, LP is owned by MetLife Insurance K.K. (Japan). 2.17% is owned by MetLife Limited (Hong Kong), 2.1% is owned by MetLife Mexico, S.A. and 0.39% is owned by Metropolitan Life Insurance Company Hong Kong Limited.
 5 88.93% of the limited partnership interest of MetLife International PE Fund III, LP is owned by MetLife Insurance K.K. (Japan), 7.91% is owned by MetLife Insurance Company of Korea Limited, 2.61% is owned by MetLife Limited (Hong Kong) and 0.55% is owned by Metropolitan Life Insurance Company Hong Limited.
 6 54.70% of the Limited Partnership interests of MetLife International PE Fund IV, LP is owned by MetLife Insurance K.K. 3.79% is owned by MetLife Insurance Company of Korea Limited, 1.51% is owned by MetLife Limited (Hong Kong).
 7 76.323% of the Limited Partnership interests of MetLife International PE Fund V, LP is owned by MetLife Insurance Company of Korea Limited and 3.469% is owned by MetLife Insurance Company of Korea.
 8 81.699% of the Limited Partnership interests of MetLife International PE Fund V, LP is owned by MetLife Insurance K.K., 15.033% is owned by MetLife Limited (Hong Kong) and 3.268% is owned by MetLife Insurance Company of Korea, Limited.
 9 MetLife Middle Market Private Debt, GP, LLC is the general partner of MetLife Middle Market Private Debt Fund, L.P. (the "Fund"). The following affiliates hold limited partnership interests in the Fund: 31.19% is held by MetLife Private Equity Holdings, 31.15% is held by Metropolitan Life Insurance Company, 35% is held by MetLife Middle Market Private Debt, GP, LLC. The remainder is held by a third party.
 10 MetLife Middle Market Private Debt Parallel GP is the general partner of MetLife Middle Market Private Debt Parallel Fund, LP. The following affiliate holds a limited partnership interest in the Fund. MetLife Insurance K.K. (100%).

parse the organizational structure of more than 1,000 life insurers to identify the institutions that have restructured their businesses specifically to target private debt markets. We establish who holds the controlling stake of these insurance companies, determine the asset manager in their organizational structures, and calculate the ownership shares of risk retention vehicles facilitating off-balance sheet investment in private debt, notably CLOs.

In the remainder of this paper, we describe broad patterns in the liabilities and assets of life insurers that have developed private debt businesses. We first show how these insurers develop stable funding using retail and institutional annuity-type liabilities. We then describe how the insurers exploit their stable capital to capture the illiquidity premium left by banks exiting lending to risky corporation and commercial real estate projects.

2 Financing private debt with annuity capital

Funding for private debt investments comes primarily from annuity-type insurance contracts guaranteed by the financial strength and credit quality of the life insurers' general account. With a few important exceptions that we will discuss, contract owners are severely restricted from withdrawing their funds for a fixed period of time. Withdrawal limits mean that these insurance liabilities are a generally stable source of funding for life insurers. In exchange, the insurer guarantees the principal and, in some cases, the rate of return.

Insurers offer these general account annuity-type contracts to both retail and institutional clients. Retail contracts include individual fixed annuities, as well as group annuities. The vast majority of these contracts for private debt investments are deferred fixed annuities, whose owners can accumulate wealth on a tax-deferred basis until their retirement. They can then choose from a range of payout options, including annuitization until death. Variable annuities are not an appropriate source of private debt funding because the contracts holder have full discretion and ownership over the asset portfolio funded by their consideration. Institutional contracts include funding agreements, which are general account contracts that pay a fixed or floating interest rate for a set period of time. Funding agreements can be privately placed, used to obtain advances from one of the Federal Home Loan Banks, structured as general account guaranteed investment contracts (GICs), or securitized into funding agreement-backed securities (FABS).

2.1 Retail annuity capital

Fixed individual and group annuities are often the first insurance contracts that private equity firms use to establish their private debt businesses. After purchasing one or more life insurers,

the firms grow their general accounts mainly by assuming blocks of annuity business from third-party insurers. Figure 2 shows the strong growth in private equity-controlled insurance assets from the combined effect of purchasing insurance companies and assuming annuity blocks.

The expansion of private equity firms' general accounts through purchases of fixed and group annuities [has been] aided by dislocation in the market for annuity blocks of business. As interest rates remained low in the post-crisis period, insurers found these lines of business unprofitable. The market for blocks of business became dislocated as sellers struggled to fund willing buyers for their strained businesses. These relatively low-cost blocks of business became natural targets for private equity firms developing their private debt businesses.

Unlike new entrants, established insurers with private debt businesses can grow by assuming fixed annuity blocks of business through reinsurance, pension buyout transactions, and selling new annuities. Figure 5 shows the reinsurance assumed by [CLO issuers] since 2006. The growth in these insurers businesses is indicated by the size of the fixed annuities assumed from third-party insurers that are not issuing CLOs (the green bars). The size of these bars contrasts to the small amount of variable annuities business that the [CLO issuers] assumed from third-party insurers.

Corporations with employee defined benefits plans have also sought to sell their obligations to avoid costly payouts amid low interest rates. These plans are generally big and require large balance sheet capacity. In general, they have been purchased by large incumbent insurers developing their private debt businesses. Figure 6 shows the large pension buyouts since 2012 that involved assets of \$1 billion or more. All except two of these buyouts went to U.S. life insurers with private debt businesses.

Pension buyouts become group annuities of the acquiring life insurer. In a pension buyout transaction, the pension fund trustees of a corporation buy a single large annuity contract from a life insurer by paying a single up-front consideration that covers all of the pension fund's commitments to its members. After a transitional period of typically two years or less, the initial annuity contract is broken into a collection of individual annuity contracts issued to each of the pension fund members. Once the individual contracts have been issued to the fund members, the trustees no longer have the obligation to pay pension benefits and can wind-down the fund and the pension fund sponsor can remove the pension liability from its balance sheet.

In addition to pension buyouts, incumbent life insurers sell new fixed annuities to organically grow their business. Figure 7 shows the annual sales volume of fixed annuity by type of life insurer for the largest 20 retailers of fixed annuities. Figure 8 shows the annual sales volume of group annuity by type of life, which includes the pension buyout transaction depicted in

Figure 5: Annuities reinsurance assumed from nonaffiliates by life insurers with private debt businesses (\$bn). Data include both individual and group annuities. Group fixed annuities surge by about \$6 billion in 2013. Reinsurance assumed is the sum of reserve credit and modified coinsurance reserve. Source: Authors' calculations based on NAIC Annual Statutory Filings, Moody's Investor Services, and Bloomberg LP.

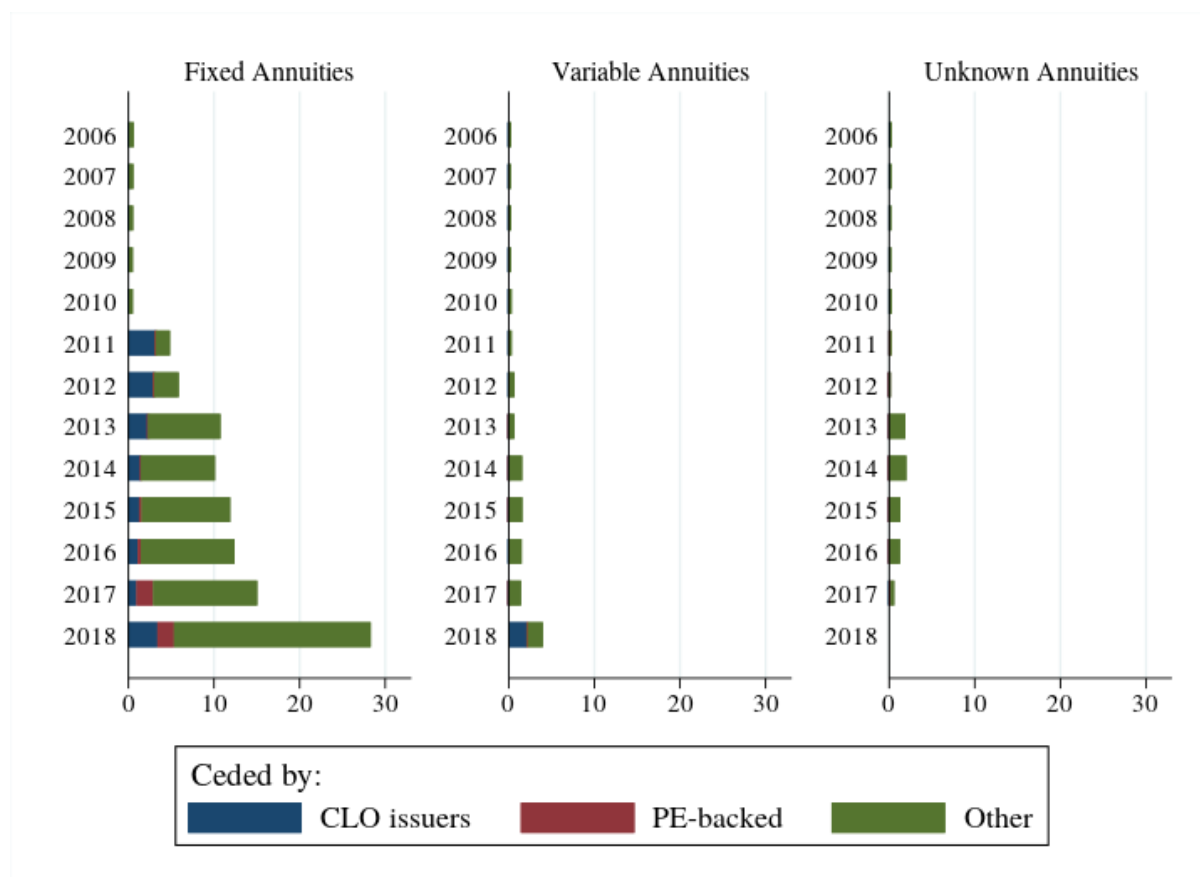
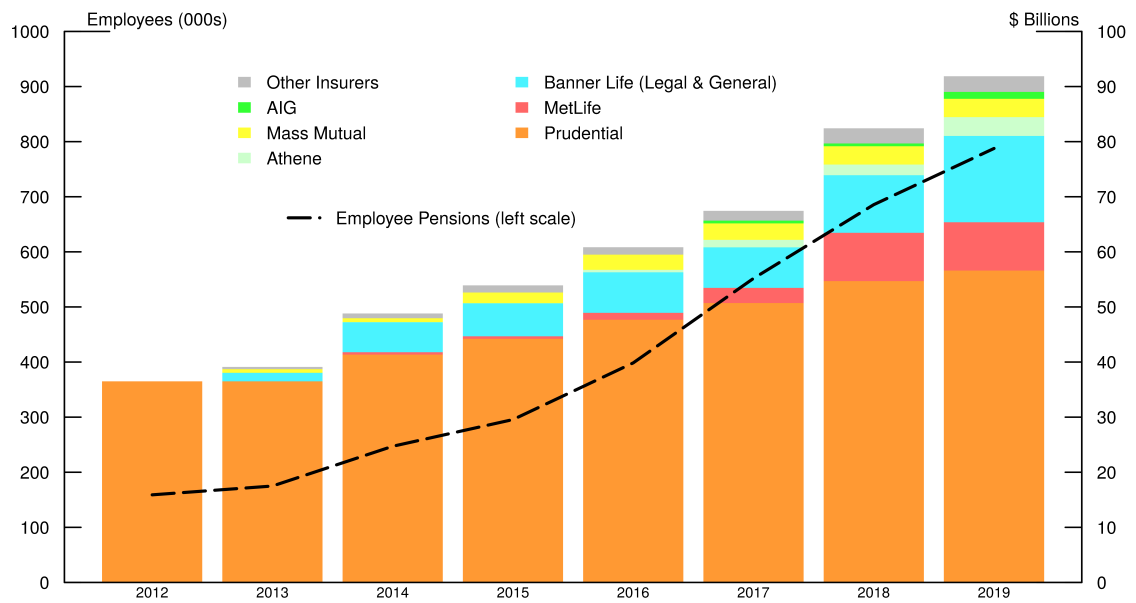


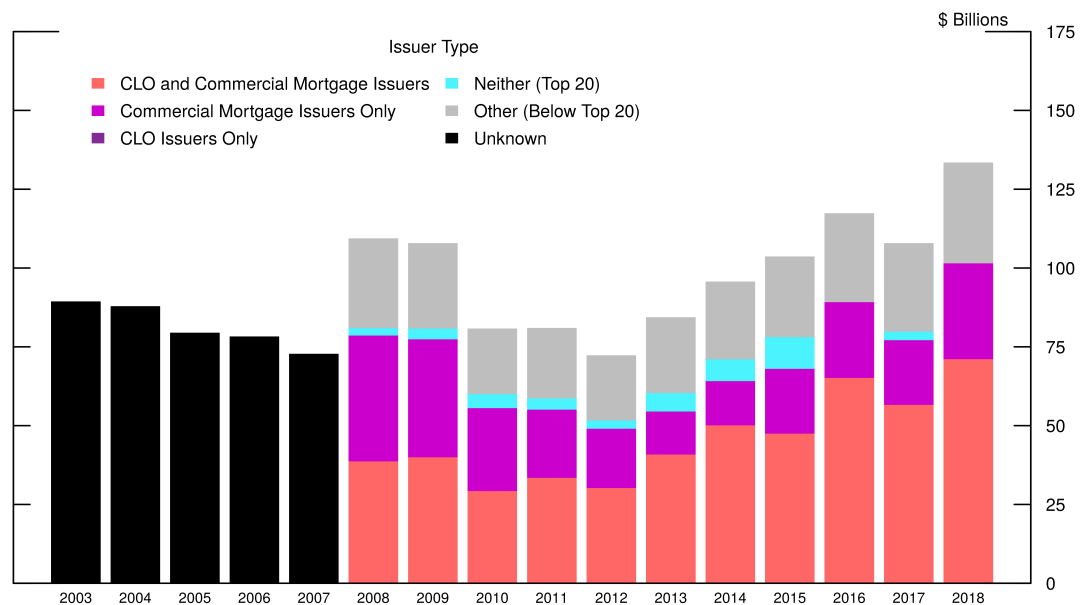
Figure 6: Pension buyouts by U.S. life insurance companies. The bars show the stock of private corporations pension liabilities acquired by life insurers at the end of each year since 2011. The dashed line shows the total number of employees covered by these pension plans. Source: Authors' calculations based on data from the Pension & Investments (P&I) data.



Source: Staff estimates based on data from the Pensions & Investments (P&I). Data are current as of 2019Q2.

Figure 6. The 2012 spike in Figure 8 includes the Prudential and General Motors \$25 billion pension risk transfer transaction, which is the largest to date. Over time, life insurers with private debt businesses have increased their share of sales and, as of 2018, account for more than half of the fixed annuity market. This growth reflects, in part, the entry of firms with private debt businesses. Figure 9 shows that the aggregate value of individual and group deferred fixed annuity account balances, which is the main source of annuity capital for life insurers with a private debt business, grew by almost \$1 trillion between 2008 and 2018.

Figure 7: Individual fixed annuities sales. The bars show the total annual amount of new individual fixed annuities by type of life insurer. Source: Authors’ calculations based on data from LIMRA Research, NAIC Annual Statutory Filings, and Bloomberg LP.



2.2 Institutional annuity capital

Large incumbent life insurers with private debt businesses are able to expand their liabilities beyond individual and group fixed annuities. Capital markets are willing to fund well-rated large life insurers. These life insurers use nontraditional insurance products issued from their general accounts through wholesale capital markets. Many of these products are based on institutional funding agreements, which are deposit-type contracts with discretionary terms. In contrast to life insurers’ traditional insurance liabilities that make payments conditional on the survival

Figure 8: Group annuities sales. The bars show the total annual amount of new group fixed annuities by type of life insurer. These data include sales of new group annuities and pension buyouts that become group annuities of the acquiring life insurer. Source: Authors' calculations based on data from the NAIC Annual Statutory Filings and Bloomberg LP.

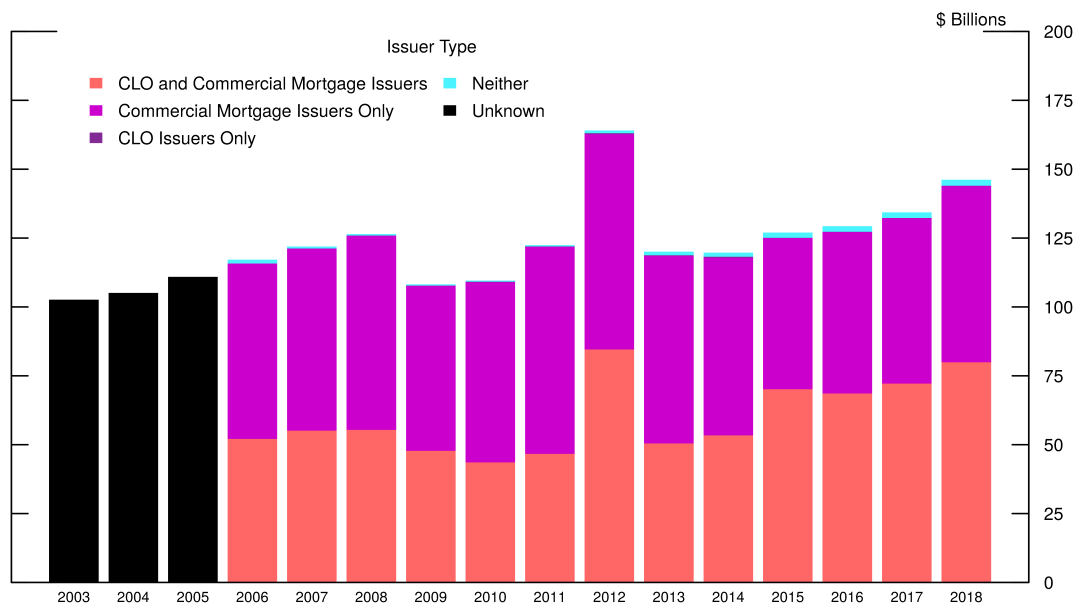
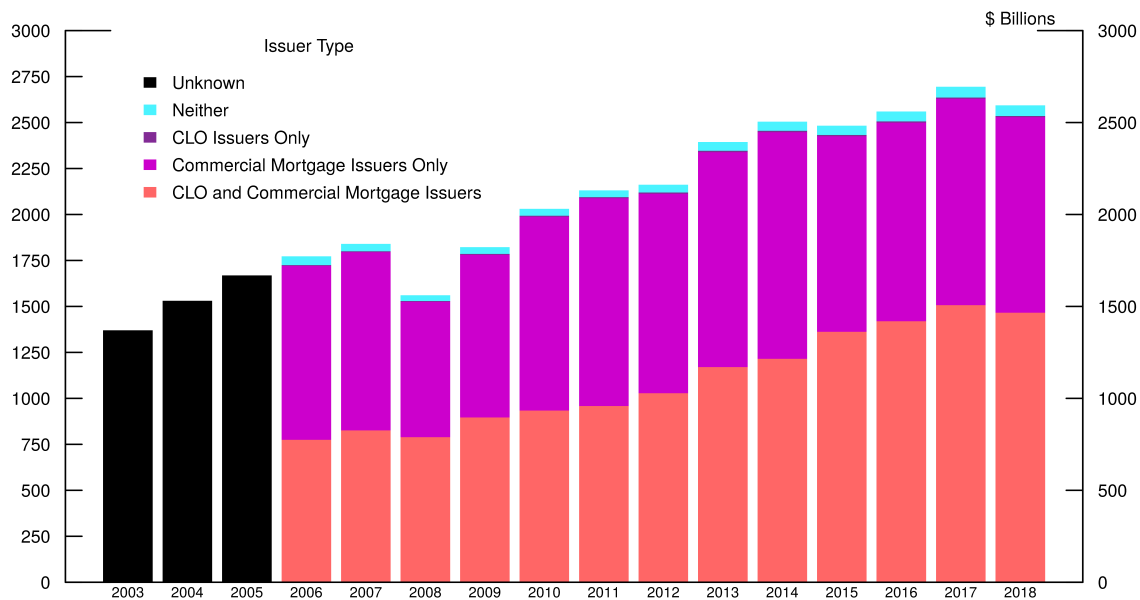


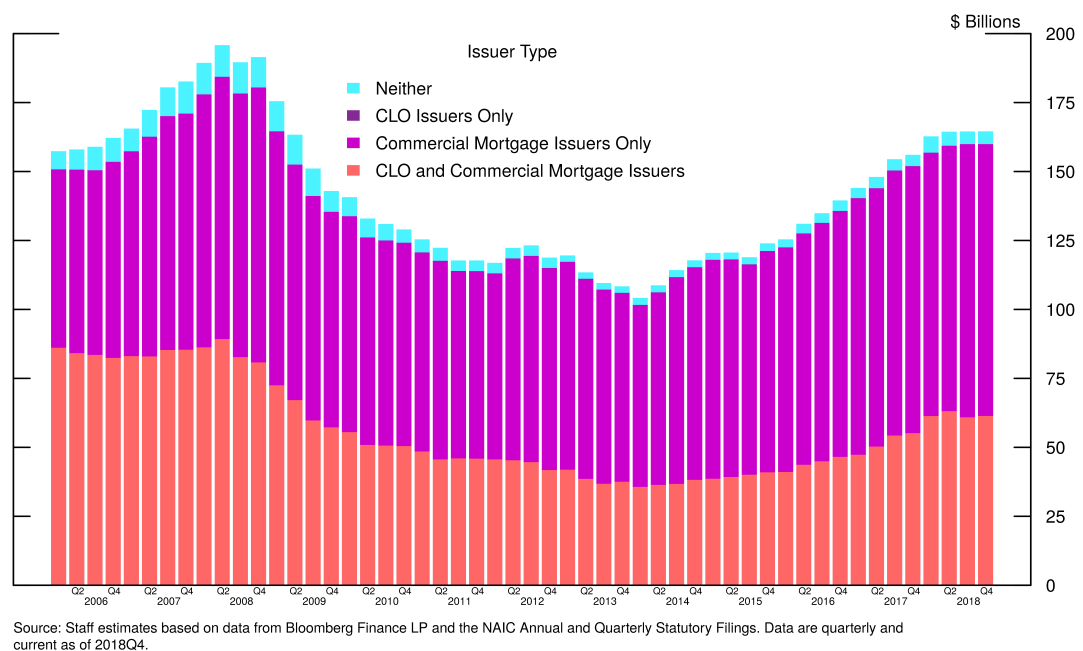
Figure 9: Retail annuity capital The bars show the annual account balances for individual deferred fixed and group annuities by type of life insurer. Source: Authors' calculations based on data from NAIC Statutory Filings, Moody's Investor Services, and Bloomberg LP.



of the contract holder, institutional funding agreements have neither mortality nor morbidity contingencies.

Institutional annuity capital is well-suited for private debt businesses because it is generally stable and adaptable to a wide range of potential capital markets. For example, institutional funding agreements can be privately placed, securitized into FABS, used to obtain advances from FHLBs, or structured as general account GICs. By adapting their funding agreements to the cheapest source of funding, life insurers investing in private debt can maximize the spread they earn over the cost of funding. Figure 10 shows the total dollar value of institutional funding agreements by type of life insurer. The institutional annuity capital is clearly biased towards insurers with private debt businesses.

Figure 10: Institutional annuity capital from funding agreements. The bars show the quarterly stock of institutional funding agreements outstanding by type of life insurer. Source: Authors’ calculations based on data from NAIC Statutory Filings, Moody’s Investor Services, and Bloomberg LP.



It is not surprising that the overlap between life insurers that issue nontraditional insurance liabilities and life insurers with private debt businesses is almost complete. Synergies between the two business activities include familiarity with complex organizational structures and flexibility to scale both operations in favorable market conditions. For example, when backed by insurers

with flexible capital market funding, asset managers can react swiftly to investment opportunities in private debt markets.

2.3 Runnable annuity capital

Some life insurers also tap short-term wholesale funding markets for their private debt businesses by adapting their annuity-type products and loosening restrictions on withdrawals. These activities give insurers greater flexibility to develop their businesses by tailoring products to attract a wider range of investors. Examples include short-term securitized funding agreements and overnight funding from securities lending transactions. These sophisticated capital markets products are typically issued only by the largest life insurers, which also have private debt businesses.

Insurers can convert funding agreements into short-term structured products to tap lower-cost wholesale funding markets. Funding agreement-backed commercial paper is attractive to short-term institutional investors, such as money market funds and private cash pools. These types of contracts give the owner the option to reclaim their funding from insurers on relatively short notice.

Insurers can also raise funding by lending their investment securities against overnight cash collateral. The borrowed securities are used by dealers to manage their inventory and life insurers' securities lending activity is an important source of liquidity for secondary market trading (Foley-Fisher, Gissler & Verani 2019). Insurers are free to reinvest the overnight cash collateral as they choose, including in longer-term illiquid assets.

These funding activities render the insurer vulnerable to runs. An early sign of the impending financial crisis of 2007-09 was when short-term institutional investors ran on certain short-term funding markets. These investors are sensitive to any repricing of risk because they are themselves vulnerable to runs (Kacperczyk & Schnabl 2013). Short-term institutional investors ran on securities lending programs—notably AIG—and ran on short-term FABS issued by several other large life insurers (Foley-Fisher et al. 2015). Runs on life insurers are like large unexpected adverse shocks to cash flows (Foley-Fisher, Narajabad & Verani 2019). During the financial crisis, runs on insurers forced them to scramble for liquidity from other sources, including FHLBs. In some cases, insurers required substantial government assistance to prevent spillovers to households and to the rest of the financial system.

3 Private debt investments

Life insurers with private debt businesses use the generally stable annuity-type liabilities described in the previous section to fund illiquid assets. In our exposition, we distinguish between private debt investments that are on-balance sheet and those that are off-balance sheet. In both cases, life insurers originate and invest in a range of assets. We identify and focus on private real estate and private credit as two of the most significant categories. These thinly-traded risky assets offer a return that includes an illiquidity premium.

Life insurers with private real estate investments originate and invest in private commercial and residential mortgage loans directly. These loans are held on-balance sheet, funded by the life insurers' annuity capital. The life insurer can also securitize their mortgage loans into off-balance sheet structured products. In these cases, the insurers' annuity capital is deployed towards risk retention to encourage other investors to provide additional funding.

Life insurers with private credit investments typically target risky firms, for example, through leveraged loans. The life insurer is potentially a relatively low-cost warehouse for the asset manager to store leveraged loans ahead of securitizing them as CLOs. Although insurance companies do hold some leveraged loans directly on their balance sheets, their affiliate asset managers can attract more investors by pooling and tranching the debt as CLOs. After a CLO is created, the life insurer continues to finance the CLO deal risk with its annuity capital either to satisfy regulatory requirements and/or to give outside investors greater confidence in the deal. This activity requires additional complex entities within the organizational structure.

Our analysis uses a broad range of detailed data reported in insurers' statutory filings. In addition to the fixed income investments reported in Schedule D, we parse the information contained in Schedules B, BA, and Y. Schedule B reports life insurers' investments in mortgages on a loan-by-loan basis. Schedule BA reports other long-term investments, such as fund holdings and affiliate equity investments, also on a case-by-case basis. Schedule Y, which we laboriously used earlier to identify the insurers with private debt businesses, provides important details about the ownership shares of the various investment vehicles, such as loan warehouses.

Table 3 provides an overview of growth in the private debt businesses of life insurers. The table shows the number of life insurers that directly hold commercial mortgages and/or issue CLOs. Over the last ten years, the number of life insurers has declined overall while the number that hold private debt has increased. Although only about half the number of life insurers have private debt investments, these insurers account for more than 90 percent of industry assets.

Table 3: Life insurers that hold direct mortgages, issue CLOs, or both. Each observation is a life insurance group or individual life insurance company if it is not part of a group. We identify life insurers that hold direct mortgages using statutory filings Schedule B.

Year	Neither	Direct mortgages holdings only	Issues CLO only	Both	Total
2008	257	189	1	15	462
2009	240	185	1	15	441
2010	236	177	2	16	431
2011	233	170	2	19	424
2012	226	163	2	19	410
2013	216	161	2	19	398
2014	211	160	2	20	393
2015	203	156	3	21	383
2016	190	152	2	22	366
2017	182	149	3	23	357
2018	164	136	3	24	327

3.1 On-balance sheet private debt

3.1.1 Private real estate on-balance sheet

Figure 11 shows that the investment by U.S. life insurers in commercial real estate loans has grown by about 70 percent since the end of the financial crisis. These investments are all held by life insurers that issue CLOs and life insurers that issue CRE loans.

3.1.2 Private credit on-balance sheet

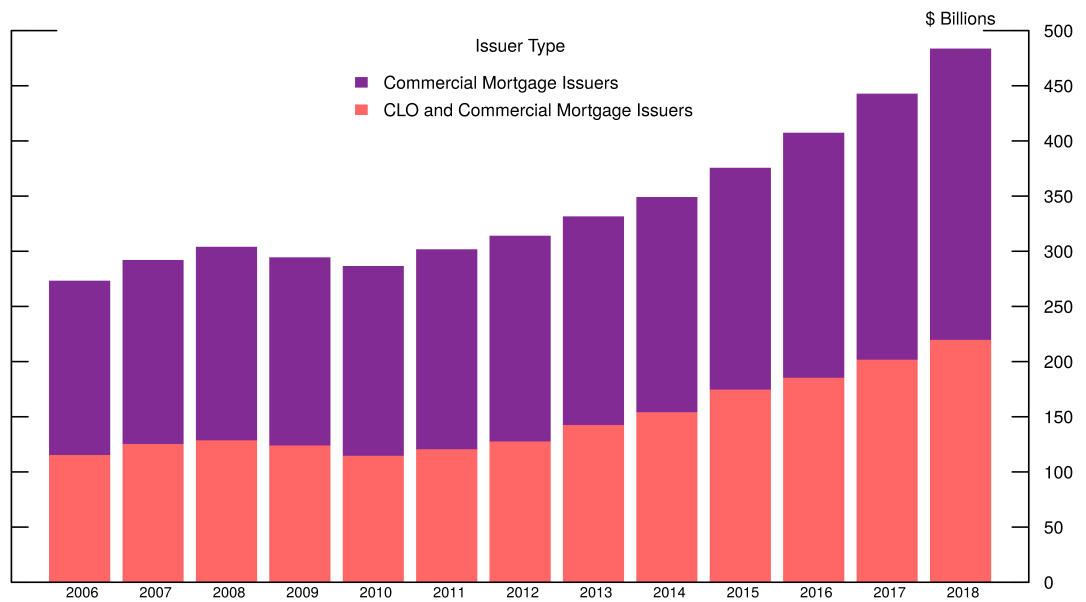
U.S. life insurers are a relatively low-cost warehouse for leveraged loans in the pipeline to CLOs. We can (partially) observe these warehouses reported on Schedule BA and Y of the life insurers' organizational structure. In addition, we use Schedules D and BA of the statutory filings to estimate that U.S. life insurers hold about \$15 billion in leveraged loans. These loans represent a small fraction—roughly 1 percent—of the leveraged loan market. However, these assets play an important role in the creation of CLOs by the insurers' affiliates.

3.2 Off-balance sheet private debt

3.2.1 Private real estate off-balance sheet (RMBS)

U.S. insurers returned to RMBS issuance in 2017, though issuance levels remains low relative to CLOs. The two main players in this relatively niche market are AIG and MetLife, issuing

Figure 11: Commercial real estate loans held by U.S. life insurers. Source: Authors' calculations based on NAIC Statutory Filings.

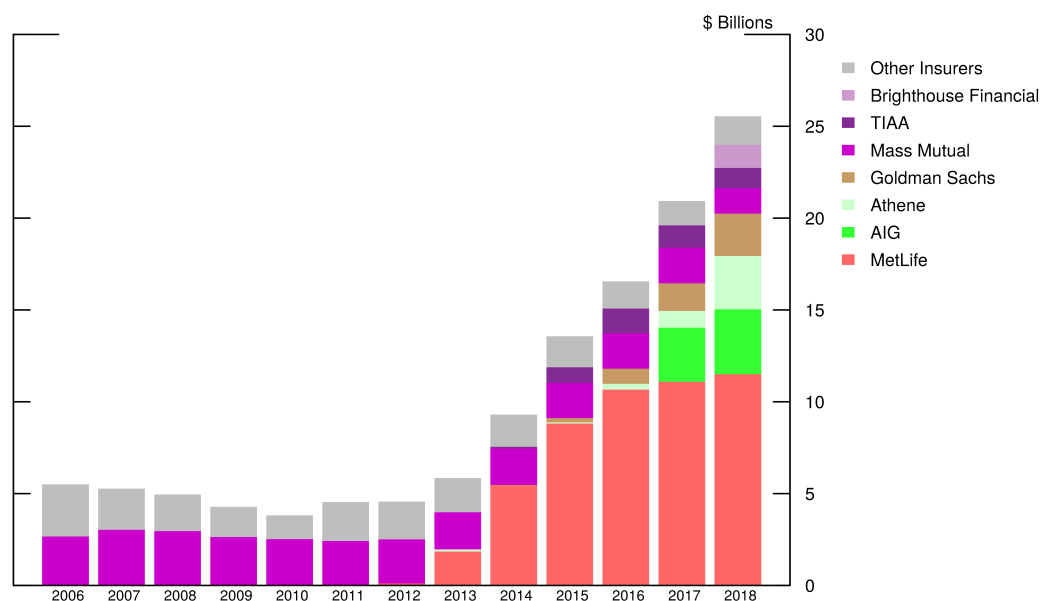


Source: Staff estimates based on data from the NAIC Annual Statutory Filings. Data are current as of 2018Q4.

together about \$4 billion in RMBS since 2017. Almost half the investment in AIG and Metlife’s RMBS comes from other U.S. insurers.

AIG and MetLife have different lending focus. AIG specializes in securitizing jumbo residential mortgage loans, while MetLife specializes in securitizing the so-called “reperforming” mortgage loans. Reperforming mortgages loans were delinquent sometime in the past and often have missing or incomplete documentation. As with CLOs, AIG and MetLife deploy their life insurers’ annuity capital towards loan warehousing and risk retention to encourage investment in their structured products. Figure 12 show the unprecedented ramp up of residential mortgage loans held on the balance sheet of U.S. life insurers.

Figure 12: Residential real estate loans held by U.S. life insurers. Source: Authors’ calculations based on NAIC Statutory Filings.



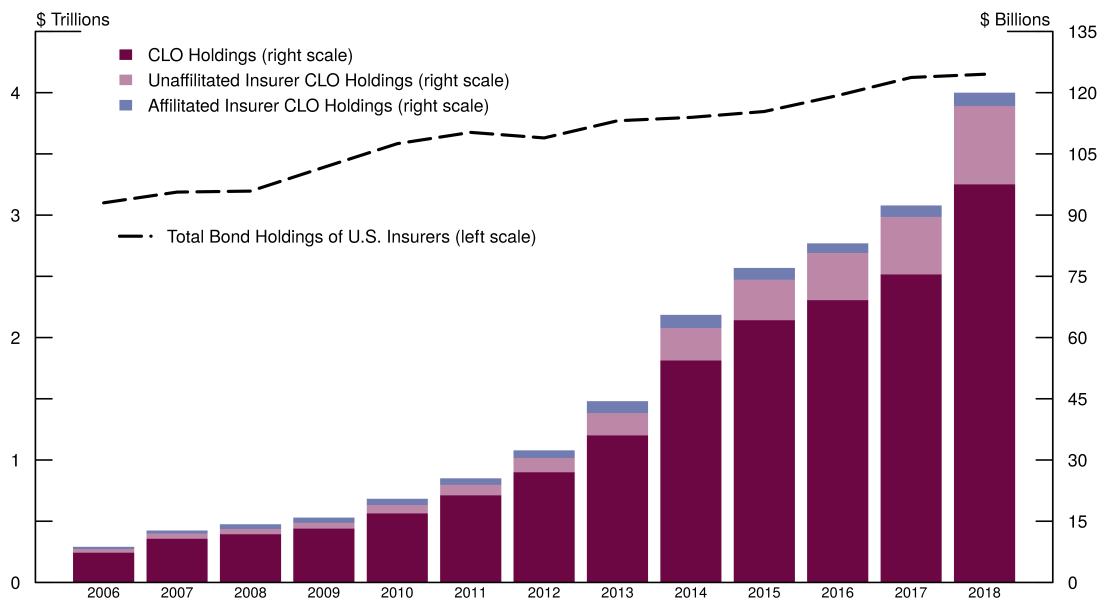
Source: Staff estimates based on data from the NAIC Annual Statutory Filings. Data are current as of 2018Q4.

3.2.2 Private credit off-balance sheet (CLOs)

Figure 13 shows that U.S. insurers’ total holdings of CLOs more than tripled from 2009 to 2018, reaching about \$93 billion in 2018Q3. In comparison, total bond holdings in the U.S. life insurance industry increased only by about 20 percent over the same time period. Life insurers’ attraction to CLOs developed for several reasons. First, many CLOs offer floating interest rates, which allowed insurers to avoid locking themselves into long-term fixed income

contracts during the post-crisis period of low interest rates. In addition, the supply of other collateralized securities has contracted since the crisis, particularly the supply of non-agency residential mortgage-backed securities (RMBS). Moreover, until recently, CLOs offered life insurers an attractive return relative to similarly-rated investments because crisis-response statutory accounting principles could be exploited to adjust a CLO’s credit rating and lower its capital charge—see Appendix B for more details.

Figure 13: U.S. insurer holdings of CLOs relative to their general account Source: Authors’ calculations based on data from NAIC Statutory Filings, Moody’s Investor Services, Fitch Ratings, and Bloomberg LP.



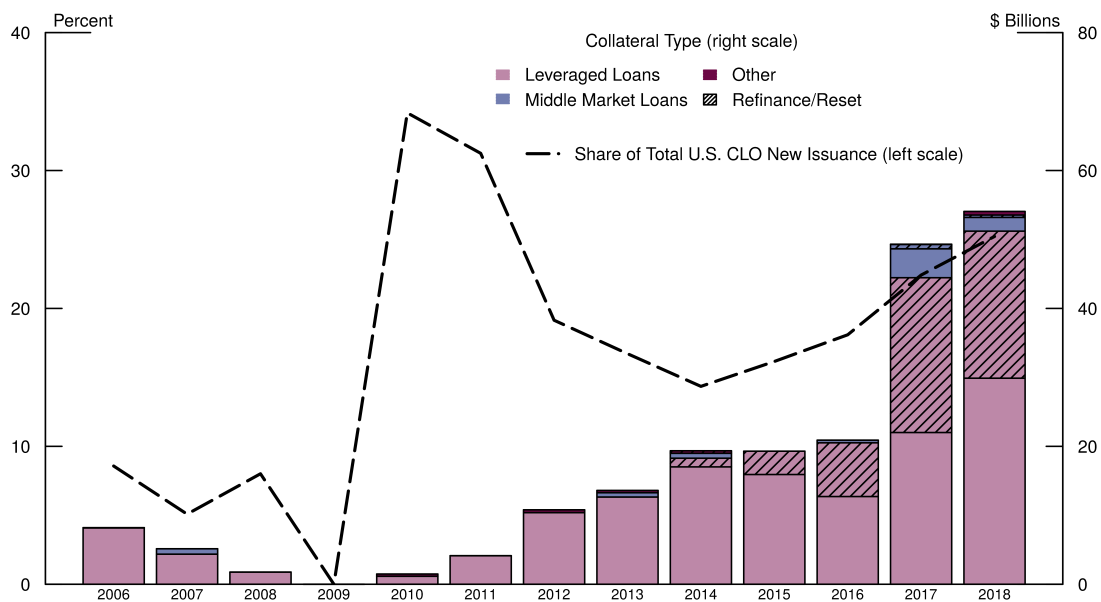
Source: Staff estimates based on data from Bloomberg Finance LP, Moody’s Investors Service, and NAIC Quarterly and Annual Statutory Filings. Data are current as of 2018Q4.

Going beyond their CLO holdings, life insurers play an important role in CLO creation using their affiliated asset managers. CLO gross issuance by U.S. life insurers surged to \$57 billion in 2017 and reached a new record of \$60 billion in 2018.⁸ Figures 14 and 15 show that new issuance amounted to roughly half of insurers’ total issuance amount, with the remainder refinancing existing CLOs. While new issuance in the CLO market declined from 2014 to 2016, the share of new issuance from U.S. life insurers doubled from 15 percent in 2014 to 30 percent in 2016.

The surge in the share of CLO new issuance from U.S. insurers was fueled in part by the Federal Reserve and SEC’s risk retention rules, enacted under Dodd-Frank, late in 2016, that

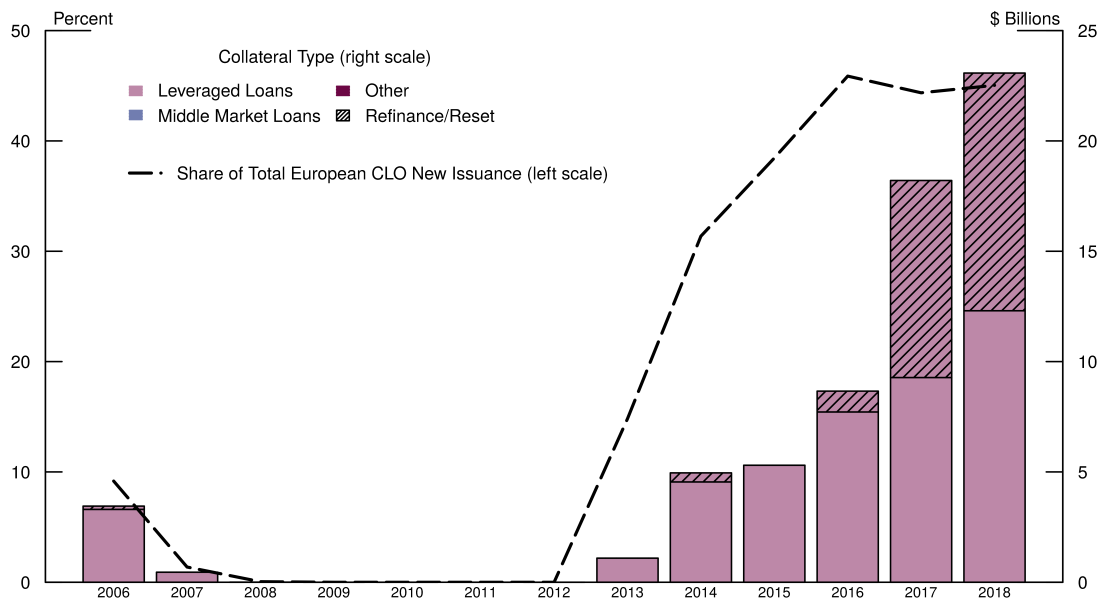
⁸ Total new CLO issuance in 2017 was approximately \$120 billion, with new issuance in 2018 exceeding \$128 billion. <http://www.leveragedloan.com/category/clo/>

Figure 14: U.S. CLO issuance by U.S. life insurer affiliates. Source: Authors' calculations based on data from NAIC Statutory Filings, Moody's Investor Services, Fitch Ratings, and Bloomberg LP.



Source: Staff estimates based on data from Bloomberg Finance LP, Moody's Investors Service, and NAIC Quarterly and Annual Statutory Filings. Data are current as of 2018Q4.

Figure 15: Euro CLO issuance by U.S. life insurer affiliates. Source: Authors' calculations based on data from NAIC Statutory Filings, Moody's Investor Services, Fitch Ratings, and Bloomberg LP.



Source: Staff estimates based on data from Bloomberg Finance LP, Moody's Investors Service, and NAIC Quarterly and Annual Statutory Filings. Data are current as of 2018Q4.

forced all deal issuers to retain 5 percent of the deal risk.⁹ The 5 percent retention may be held as a vertical slice, a horizontal slice, or a combination of the two creating an L-shaped slice. The requirement gave well-capitalized insurers a comparative advantage in CLO issuance through their ability to finance the deal risk. CLO issuance by some traditional managers collapsed because their balance sheets were too small to finance the deal risk and they were forced to act collectively to raise additional financing through third party investors.¹⁰ By contrast, insurers with excess annuity capital can retain a deal's risk for a relatively low capital charge. Consequently, insurers swiftly began managing their own CLO deals rather than investing in other managers' CLOs and replaced traditional managers' issuance.

In addition to the U.S. risk retention rules, several other jurisdictions have introduced similar "skin in the game" requirements since the financial crisis.¹¹ Although the U.S. risk retention rule was partly repealed in 2018, life insurers continue to invest in CLOs issued by their affiliated asset managers to meet foreign rules and as signal of quality to all investors.¹²

3.3 Vehicles specifically used to issue CLOs

U.S. life insurance companies often use intermediate vehicles to meet risk retention rules and transfer the CLO deal risk onto their balance sheets. Table 4 shows the risk retention structures created for the 161 U.S. CLO deals that life insurer affiliates have issued since 2010. Appendix C describes the details of majority-owned affiliates (MOA), capitalized majority-owned affiliates (CMOA), and capitalized manager vehicles (CMV). In addition to the U.S. CLO deals, there are 37 European CLOs that use different methods of risk retention. In total, 69 of the 198 CLO deals satisfy risk retention rules using a vertical slice of the deal. A further 54 CLO deals use a horizontal slice and 4 CLO deals use an L-shaped slice. Through these structures, insurance companies can finance the risk retention vehicle in a variety of ways that show up in different parts of their statutory filings.

Table 4: Types of risk retention used by U.S. life insurers. Note that each insurer may choose a different method to retain risk for each CLO it issues. Data in the table cover 158 U.S. CLOs issued or refinanced from 2010 to 2017 by U.S. life insurer affiliates as of 2019Q2. In addition, there are 36 European CLOs that use different methods of risk retention. In total, 65 of the 194 CLO deals satisfy risk retention rules using a vertical slice of the deal. A further 54 CLO deals use a horizontal slice and 4 deals use an L-shaped slice. Source: Authors' calculation based on data from NAIC Statutory Filings, Fitch Ratings, and Bloomberg LP.

Type of risk retention	No. of insurers	No. of CLOs
Balance Sheet	3	9
MOA	8	45
CMOA	4	12
CMV	2	5
Other	1	2
Unknown	10	85
Total	28	158

Table 5: Distribution of affiliated CLO deal risk retained by U.S. life insurers. Each row reports the distribution across CLOs of the holdings of U.S. life insurers in the CLOs that they issued in that year. Holdings are calculated as the sum of fixed income investments reported in Schedule D and other investments reported in Schedule BA, including equity tranches and holdings of risk retention vehicles. We assume that an insurer's holdings of an affiliate risk retention vehicle are shared equally between the CLOs that are supported by that vehicle. Source: Authors' calculations based on data from NAIC Statutory Filings, Moody's Investor Services, Fitch Ratings, and Bloomberg LP.

Year	Mean	p25	Median	p75	# of CLOs
2010	12.5	12.5	12.5	12.5	1
2011	7.8	3.3	6.3	12.3	4
2012	12.7	3.1	8.0	10.5	12
2013	20.7	6.3	13.2	28.7	20
2014	15.4	6.0	8.8	21.2	24
2015	18.1	2.7	4.8	18.1	19
2016	14.3	4.2	5.5	16.6	21
2017	10.1	3.5	5.0	9.4	56
2018	10.6	2.7	5.0	9.0	56
Total	13.1	3.7	5.5	13.0	213

3.4 Life insurers' retention of affiliated CLO deal risk

Table 5 shows our estimates for each CLO of the amount of the deal risk that was retained on the balance sheet of the insurer at the end of the year that the deal was issued. We constructed these data by combining exposures recorded in both Schedules D and BA. For each deal, we first calculate fixed income investments in each deal as reported on Schedule D. We then add the exposure to each deal reported on Schedule BA, including equity tranches and holdings of risk retention vehicles. We assume that an insurer's holdings of an affiliate risk retention vehicle are shared equally between the CLOs that are supported by that vehicle.

The table reports the distribution of risk retained across CLOs issued in each year. Across the sample as a whole, U.S. life insurers retain on average about 5 percent of the deal risk they create. The mean of the distribution is consistently above the median as insurers retain more risk for some deals.

4 Concluding remarks

In this paper, we document the development of a new financial business model that focuses on investing in thinly-traded private debt to capture the illiquidity premium left by banks exiting these business lines. Since the financial crisis, new financial entities have emerged that combine U.S. life insurers, offshore captive reinsurers, and asset managers in a triangular organizational structure. As banks retreated from corporate lending in the post-crisis period, these entities developed their businesses specifically to meet the needs of companies seeking capital. Although we cannot identify a causal effect of regulation on their growth, we note that the institutional design allows these entities to operate at the precise intersection of regulatory boundaries: At the limits of oversight by the Federal Reserve, state insurance regulators, the Security and Exchange Commission, and the Financial Stability Oversight Council. As their affiliated asset managers originate illiquid debt and create securities, life insurers earn a spread over their stable funding by investing in private debt.

⁹ Even before the risk-retention rule, CLO issuance by U.S. life insurers was growing rapidly, averaging 20 percent per year between 2010 and 2016, driven partly by the low interest rate environment that increased demand for relatively high yield debt obligations offering floating interest rates.

¹⁰<https://asreport.americanbanker.com/news/what-rollback-of-risk-retention-could-mean-for-clo-managers>

¹¹ Rules were introduced in 2010 in Europe and 2019 in Japan.

¹² "A year after rules requiring firms to hold a chunk of their own CLO deals were scrapped, evidence suggests they're increasingly opting to do so of their own accord. 'CLOs getting issued have required more equity support from the manager compared to last year,' said Jim Schaeffer, the deputy chief investment officer at Aegon Asset Management in Chicago. 'Managers are being asked to buy a portion of the equity to get deals done.' Schaeffer's own firm has retained a small part of one deal, though 'nowhere near a control piece,' he said." <https://www.bloomberg.com/news/articles/2019-05-07/locked-out-of-credit-party-clos-flash-cash-to-get-deals-done>

Our findings have immediate policy implications. The connections we measure between life insurers, captive reinsurers, and asset managers provide a framework for testing the resilience of the insurance industry—and the financial system more broadly—to direct and indirect shocks to the corporate sector. Importantly, these tests focus on tail risks and complement the insurance regulators’ capital adequacy assessments based on moderately adverse conditions (AAA 2014). By holding the riskiest portions of the CLOs issued by their affiliates as well as a rapidly growing portfolio of commercial real estate loans, life insurers are vulnerable to a downturn in the credit cycle. For example, a widespread decline in the value of the loans backing the CLOs could directly wipe out the equity held by the affiliated life insurers. As we learned from the 2007-09 financial crisis, even a relatively small exposure could create a vulnerability for life insurers who pledged their excess capital to the deal risk. In addition, because the vast majority of affiliated life insurers that create and hold CLO deal risk tend to rely on wholesale funding, these insurers could experience further pressure as liquidity-sensitive institutional investors—such as securities borrowers, FABS investors, or FHLBs—withdraw their funding and/or increases margins. The combination of eroding equity and rapid institutional investor withdrawals would likely create a severe liquidity crisis for the life insurance industry.

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A The FSOC designation of MetLife as a non-bank SIFI

On December 16, 2014, the Financial Stability Oversight Council (FSOC) Nonbank Designations Committee released its report on MetLife at the conclusion of its almost two-year long review. The report included the recommendation “that the FSOC Council make a final determination that material financial distress at MetLife could pose a threat to the financial stability of the United States and that MetLife should be supervised by the Board of Governors of the Federal Reserve System and subject to enhanced prudential standards pursuant to section 113 of the Dodd-Frank Act.” One of the core arguments for the designation was MetLife’s heavy reliance on non-traditional capital funding products, such as funding agreement-backed securities, that experienced a run during the crisis. MetLife contested the designation in court, winning a landmark case in April 2016 in which U.S. District Judge Rosemary Collyer ruled that the designation of MetLife by the FSOC was “arbitrary and capricious” (*MetLife Inc. v. Financial Stability Oversight Council*, 177 F. Supp. 3d 219, D.D.C. 2016). In January 2018, the FSOC chaired by Steven Mnuchin agreed to end the legal fight.

In the redacted confidential basis, the FSOC’ Nonbank Designations Committee concludes that:

[I]f MetLife were to experience material financial distress, it could be forced to liquidate assets to meet its obligations to counterparties, contract holders, and policyholders. In order to meet a rapid increase in liquidity demand, MetLife could be forced to sell assets at fire-sale prices, which could impair financial intermediation or financial market functioning. There are two primary sources of potential liquidity strains that could cause or contribute to a forced asset liquidation: institutional and capital markets products that can be terminated or not renewed by the counterparty, and insurance-related liabilities. First, if MetLife experienced material financial distress, it could be subject to early termination of, or the inability to roll over, its institutional products. For example, actions by institutional counterparties to reduce exposures to MetLife could cause the company to be unable to roll over a portion of its approximately \$30 billion of outstanding FA-backed securities (FABS), or to be forced to sell assets in response to early returns of securities borrowed in connection with its approximately \$30 billion securities lending program. [...] A forced liquidation of MetLife’s assets could cause significant disruptions to key markets, including corporate debt and asset-backed securities (ABS) markets. The potential for a forced asset liquidation by MetLife could be exacerbated by MetLife’s leverage, which is among the highest of its peers.

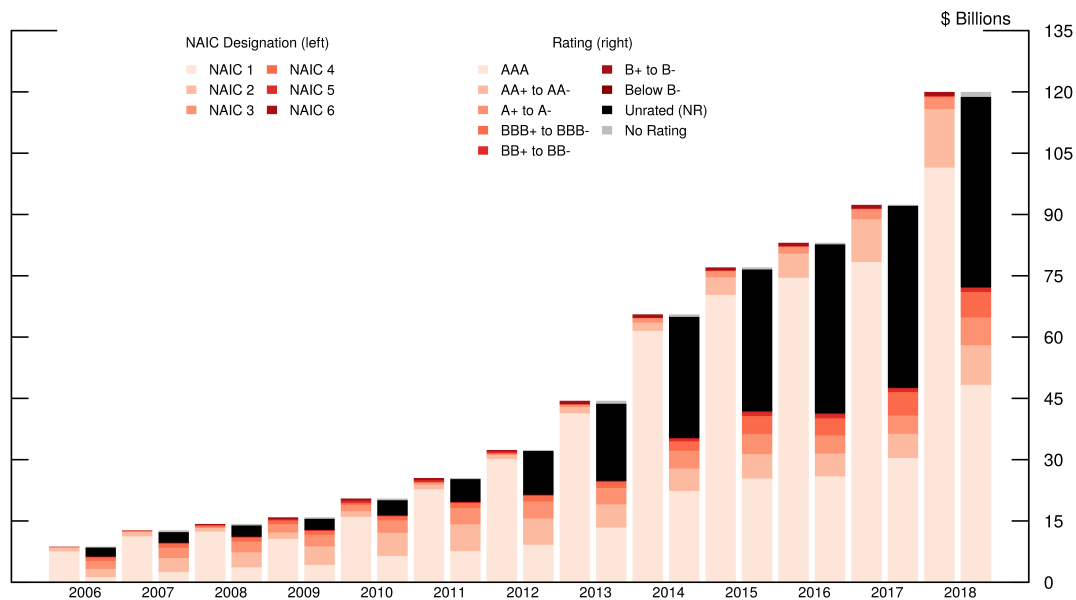
The FSOC non-bank committee noted further that, by holding about half of MetLife short-term FABS, U.S. money market fund (MMFs) were vulnerable to depositor runs in the event of a MetLife default.

B Regulatory capital charges for CLO holdings

Until recently, CLOs offered life insurers an attractive return relative to similarly-rated investments because crisis-response statutory accounting principles could be exploited to adjust a CLO's credit rating and lower its capital charge. As shown in Figure 17 and Figure 16, almost \$75 billion of life insurer's CLO holdings have a 0.3 percent capital charge as indicated by NAIC Designation 1 even though less than \$50 billion of their holdings are rated by Moody's at A3 and above. This treatment arises from changes to the statutory accounting principles that were introduced during the financial crisis to save insurers from their exposure to RMBS whose capital charges rose from 0.3 percent (NAIC Designation 1) to up to 19.5 percent (NAIC Designation 6) when the securities were downgraded. The rating adjustment methodology reduces the capital charge for certain loan-backed and structured securities that have low book value relative to par value. The reduction in capital charges is a boon for insurance companies that invest aggressively including, for example, those tied to private equity companies such as Apollo and Guggenheim.

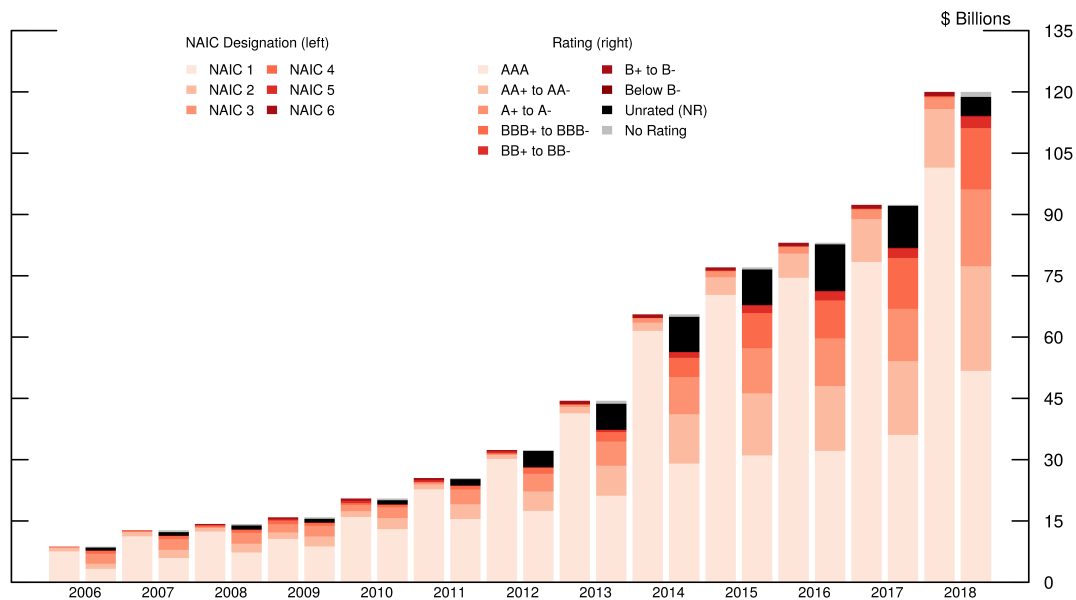
CLO holdings are concentrated among large life insurers. These insurers add exposure to CLOs by issuing non-traditional liabilities designed to tap institutional and short-term wholesale funding markets. According to statutory filing, a handful of insurers finance their CLO holdings using securities lending cash collateral. This financing strategy is similar to AIG's cash collateral reinvestment in non-agency RMBS that contributed to its collapse in 2008. Funding a CLO with overnight securities lending cash collateral is less costly than financing the same CLO with annuity capital because there is no actuarial reserve requirement and no liquidity standard set by state insurance regulators.

Figure 16: Ratings and capital charge associated with U.S. insurer holding of CLOs—minimum rating Source: Authors' calculations based on data from NAIC Statutory Filings, Moody's Investor Services, Fitch Ratings, and Bloomberg LP.



Source: Staff estimates based on data from Bloomberg Finance LP, Moody's Investors Service, and NAIC Quarterly and Annual Statutory Filings. Data are current as of 2018Q4.

Figure 17: Ratings and capital charge associated with U.S. insurer holding of CLOs—maximum rating Source: Authors' calculations based on data from NAIC Statutory Filings, Moody's Investor Services, Fitch Ratings, and Bloomberg LP.



Source: Staff estimates based on data from Bloomberg Finance LP, Moody's Investors Service, and NAIC Quarterly and Annual Statutory Filings. Data are current as of 2018Q4.

C U.S. risk retention structures

There are three main arrangements to satisfy risk retention rules: Majority-owned affiliates (MOAs), capitalized majority-owned affiliates (CMOAs), and capitalized manager vehicles (CMVs). Figures 18, 19, and 20 are stylized diagrams of the three arrangements.

CMVs retain the CLO deal risk via a separate management company. The company invests in the risk retention securities and, potentially, manages the CLOs. Unlike the MOA alternative arrangement for satisfying risk retention rules, there is no accounting requirement that the legacy manager make a minimum capital contribution to a CMV (or own a majority of its equity) or that it have “control” over major economic decisions by the CMV (Global Legal 2017).

In Creditflux CLO Yearbook (pg. 26) the market analysts noted that: “There are two other options to achieve risk retention compliance for managers that are not keen on raising capital for MOAs, CMOAs and CMVs. Managers taking a vertical, rather than horizontal, strip in the CLO can finance that vertical strip in various ways. Insurance companies have emerged as the key financiers in this market, although some arrangers are also understood to offer financing solutions. The latest approach to hit the market is a syndicated vertical strip, developed by RBC.” <http://creditflux.com/asset/documents/ef3551c03a43b479d5b9a17a3495d603.pdf>

Figure 18: Stylized diagram of majority-owned affiliate. Source: Creditflux CLO Yearbook 2017.

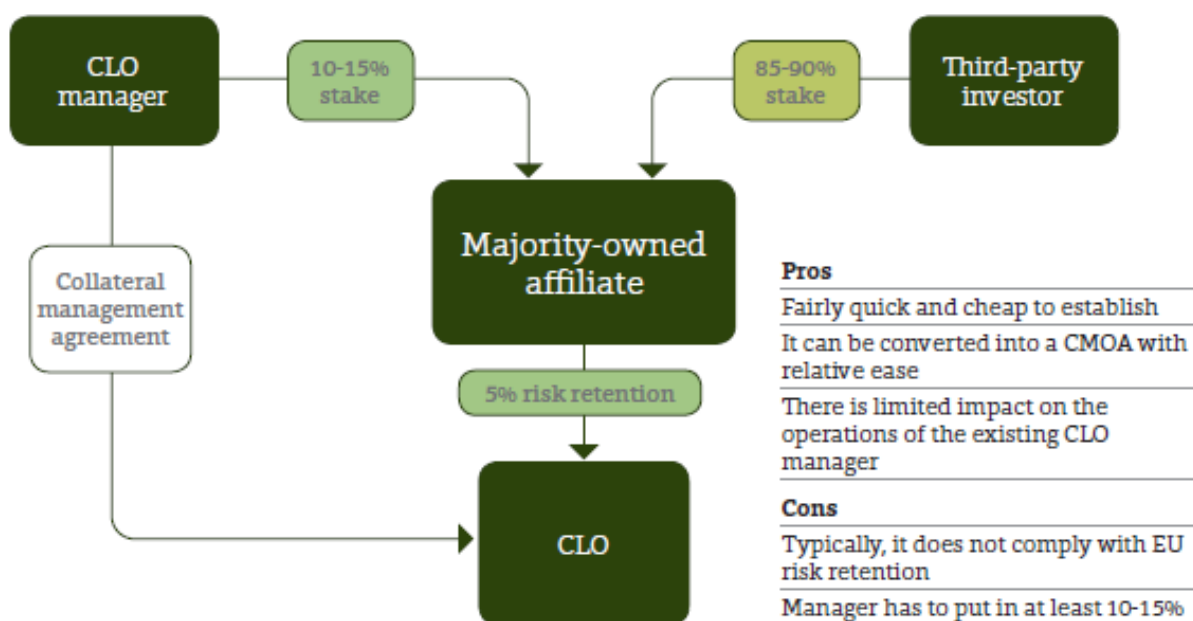


Figure 19: Stylized diagram of capitalized majority-owned affiliate. Source: Creditflux CLO Yearbook 2017.

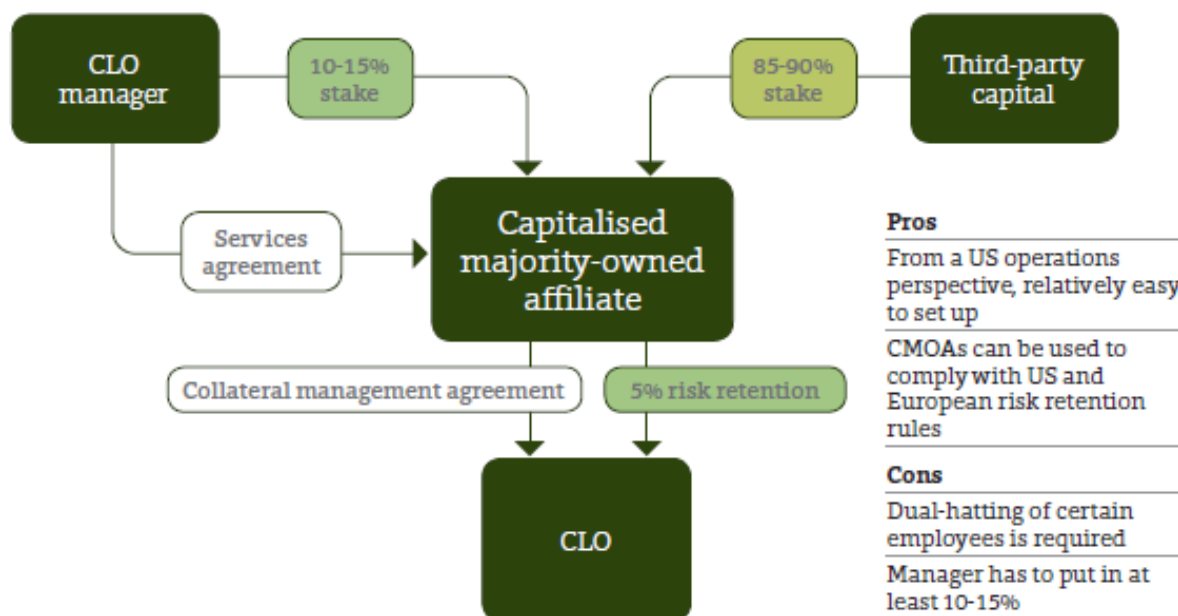


Figure 20: Stylized diagram of capitalized manager vehicle. Source: Creditflux CLO Yearbook 2017.

Capitalised manager vehicle

