Nonbank Lending and Credit Cyclicality*

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September 2020

Abstract

We show that the cyclicality of credit supply in the syndicated lending market is driven by nonbanks. Lending by nonbanks is about three times as cyclical as lending by banks, even after controlling for loan characteristics and loan demand. This cyclicality is explained by funds available to Collateralized Loan Obligations (CLOs) and loan mutual funds, the largest nonbank investors in the market. In busts, lack of CLO issuances and outflows from mutual funds lead to a drop in primary market originations of syndicated loans; in booms, inflows to nonbanks spur new loan originations. We argue that CLO issuance is cyclical because the benefit from securitization – the "CLO arbitrage" – varies over the credit cycle. The cyclicality in syndicated lending is not explained (nor offset) by bank behavior: banks cut originations when nonbank lenders exit the market, irrespective of their characteristics. Our paper brings forth an important reason for the decline in loan originations during both the Great Recession and the COVID-19 crisis.

JEL Classification: G21, G23, E32, E44, G01

Keywords: Nonbanks, credit cyclicality, CLOs, mutual funds, leveraged lending, COVID-19, Great Recession

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*We are grateful to Viral Acharya, James Finch, Arpit Gupta, Toomas Laarits, Simone Lenzu, Ralf Meisenzahl, Thomas Philippon, Anthony Saunders, Philipp Schnabl, and seminar participants at the Federal Reserve Board and NYU Stern for helpful comments. All remaining errors are our own.

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1 Introduction

The financial crisis painfully illustrated that financial conditions have substantial economic consequences. The role of the financial sector in the propagation of economic fluctuations has subsequently been at the heart of both macroeconomic research and economic policy – it is crucial to understand the institutions and forces behind financial stress to design macroprudential regulation that can prevent funding crunches. In practice, such regulation has focused on banks. However, the recent growth of nonbank lenders has raised questions about their role in propagating shocks. For example, during a recent Financial Advisory Roundtable meeting at the New York Fed, *"participants discussed financial stability implications of the rapid growth in nonbank credit provision in recent years"* (FAR 2019). Despite their growing importance, however, there is little empirical evidence for whether, and how, the greater presence of nonbanks impacts the propagation of financial stress to the real economy.

This paper aims to close that gap by studying the cyclicality of nonbank lending in the syndicated loan market over the last two decades. The syndicated loan market is an important funding source for middle-market and large corporations, and any stress within this market is therefore likely to have large economic consequences.[1] Figure 1 summarizes the motivation for our paper. As noted by Irani, Iyer, Meisenzahl, and Peydro (2020) and as shown in Panel A of Figure 1, credit provisioning by nonbank lenders, such as collateralized loan obligations (CLOs) and loan mutual funds, has increased substantially and is now as large as credit provisioning by banks. It is important to understand the financial stability implications of this development. Indeed, as Panel B shows, lending by nonbanks is substantially more cyclical than lending by banks.

To further understand the cyclicality of bank and nonbank lending, we relate loan origination volumes and spreads to the broader credit cycle, as proxied by the Excess Bond Premium of Gilchrist and Zakrajšek (2012) in Figure 2. As shown in Panel A, the nonbank lending share declines when economy-wide credit conditions tighten and rises when credit

[1]The Shared National Credit Review in January 2020 estimates the total size of the syndicated loan market to be around 4.8 trillion USD. This is likely a lower bound as some syndicated loans do not fall under the SNC reporting requirements.

conditions ease. Moreover, Panel B shows that the spread on nonbank facilities rises relative to bank ones when credit conditions tighten, consistent with a stronger contraction of nonbank lenders' credit supply in bad times. This time-series evidence indicates that nonbank lenders are responsible for a large part of the cyclicality in the syndicated loan market. Importantly, this evidence stands in contrast to the existing literature that relates funding conditions in the syndicated loan market to bank health (Ivashina and Scharfstein (2010a), Santos (2010), Chodorow-Reich (2013)). Our results are particularly surprising because CLOs –by far the largest nonbank lender– are long-term financed (8-10 years), and standard macro models with leverage constraints for intermediaries suggest that long-term financed intermediaries should be less cyclical.

Of course, Figures 1 and 2 aggregate across a wide range of borrowers so that the higher cyclicality of nonbanks may be the result of credit demand rather than credit supply. This is particularly true if nonbanks serve a different set of borrowers than banks. This is the central challenge of our paper: to isolate the role of nonbank credit supply on the cyclicality of credit provisioning. We exploit two features for identification. First, while banks invest primarily in Term A loans, nonbank lenders invest almost exclusively in Term B loans.[2,3] Second, while some borrowers of the syndicated lending market are primarily served by either type of lenders, banks and nonbanks overlap in an important part of the market. Nearly 30% of borrowers in the syndicated lending market have received both bank and nonbank term facilities, with 20% receiving loans from both within the same deal. In other words, a substantial part of syndicated deals contains both a bank (Term A) and a nonbank (Term B) facility.

This allows us to study changes in loan spreads and origination volumes of nonbank facilities relative to bank ones, when the same borrower is served by both bank and nonbank lenders, in the same deal. Furthermore, since bank and nonbank facilities within the same deal are claims on the same cashflows, are governed by the same contract, and have the same seniority (Ivashina and Sun 2011), our results cannot be explained by missing fundamental

[2]We focus on syndicated *term* loans in our main analysis, because these loans fund most corporate activity. Contrary to that, credit lines are used as liquidity insurance and may remain undrawn. Our results are robust to including credit lines.

[3]We verify this assumption in the paper using loan holdings data from Creditflux.

variables.[4] Our within-deal strategy also controls for differences in borrower loan demand as in Khwaja and Mian (2008). Our identification strategy is reminiscent of Ivashina and Sun (2011) who compare prices of bank and nonbank facilities within the same deal in order to document downward pricing pressures during the LBO boom (2002 to 2007). Applying our empirical design, we find that nonbank loan volumes are three times as cyclical as bank loan volumes. Furthermore, nonbank loan spreads co-move several orders of magnitude more with the credit cycle than bank loan spreads.

To identify the channel affecting nonbank credit supply, we look at issuances of CLOs and flows into loan mutual funds. Together, CLOs and mutual funds hold 80% of nonbank loans and therefore represent the majority share of nonbank lending. Since flows into CLOs and loan mutual funds affect the capacity of these nonbank lenders to purchase Term B loans, institutional fund flows likely have a strong impact on nonbank loan originations. First, we find that fund flows are highly correlated with the credit cycle in the time-series. Second, we instrument institutional flows with the Excess Bond Premium, while controlling for loan demand using the deal fixed effect. This allows us to isolate the effect of the credit cycle on loan originations that runs through fund flows. The exclusion restriction is based on the argument that aggregate financial conditions do not affect relative Term A and Term B loan originations to the same borrower, in the same deal, except through changes in fund flows. We find that instrumented fund flows strongly impact originations of nonbank loans. This shows that the cyclicality in originations of loan types that are intended to be held by nonbanks, i.e. Term B loans, is indeed caused by the cyclicality of nonbanks' funding.

Our main analysis compares credit provision by banks and nonbanks to the same borrower in the same deal, and therefore controls for borrower loan demand. One might, however, be concerned that our results are influenced by differences in the strength of banking relationships. Specifically, banks build and maintain relationships through the issuance of Term A loans (held on their balance sheet) as opposed to Term B loans (sold off to nonbank lenders). Thus, one could be worried that the relative increase in Term A loan issuance during busts

[4] The main difference between Term A and Term B loans is the timeline of the principal repayment. Term A facilities are amortizing loans, while Term B facilities are bullet loans. Moreover, Term B facilities often have longer maturities than Term A facilities. We therefore control for maturity in our analyses which does not affect the results.

is driven by stronger relationships between the borrower and the Term A facility lenders compared to the relationships with Term B facility lenders. To address this, we include controls for the strength of bank-borrower relationships interacted with loan type and the financial cycle variable in all our analyses. Our results are nearly unchanged by the inclusion of these controls illustrating that banking relationships do not explain our findings.

An alternate hypothesis is that banks themselves drive the cyclicality of nonbanks. Banks are exposed to pipeline risk when originating nonbank loans (Bruche, Malherbe, and Meisenzahl 2020) and typically retain part of the Term A tranche and the credit line of a loan deal. This could make bank balance sheets important for the origination of nonbank loans, even though they are subsequently sold to institutional lenders.[5] If banks with cyclical balance sheets specialize in originating nonbank loans, then this might explain our results. Moreover, this argument would be consistent with the prior literature on syndicated lending during the Great Recession: Ivashina and Scharfstein (2010a), Santos (2010), and Chodorow-Reich (2013) emphasize the importance of bank health and liquidity for originations in the syndicated lending market, with limited or no discussion of nonbanks.

To rule out the alternative explanation that bank health is driving our results, we compare originations and prices of bank and nonbank term loans originated by the same bank in the same month. If bank lending capacity drives the cyclicality, we should see a decline in both bank and nonbank facilities for the same bank. Instead, we find a much larger and remarkably consistent decline in nonbank originations across all banks, irrespective of their own health. Moreover, it shows that banks are unable or unwilling to step in and close the gap left by nonbanks even when they remain well-capitalized. In fact, we show that a bank's dependence on nonbank lenders is far more correlated with declines in total loan originations during the Great Recession than measures of bank health commonly used in the literature. We furthermore present time-series evidence supporting the fact that nonbank lenders forcefully retracted from the primary loan market in the Great Recession. Additionally, we show that

[5] An alternative hypothesis is that banks act as 'gate-keepers', inviting nonbanks to a syndicate only after exhausting their lending capacity. If credit demand falls, banks may be able to satisfy borrower demand internally, leaving no room for nonbanks. This, however, is inconsistent with the fact that *relative* nonbank loan spreads rise and quantities fall when credit conditions tighten. A reduction in co-investment opportunities for nonbanks — as banks limit credit offerings to nonbanks when credit conditions tighten — would lead to a *relative* compression, not blow up, of spreads.

nonbank lending dropped sharply during the COVID-19 crisis in Spring 2020, while bank lending actually increased during the same time period. These results bring new light to our understanding of syndicated lending during the Great Recession and highlight the growing importance of nonbank lenders for financial stability.

After confirming that bank-centric theories are unlikely to explain our results, we focus on the reasons for the cyclicality of nonbank funding. Since a substantial part of the underlying investors in CLOs have long-term funding, short-term debt does not seem to be the main culprit.[6] Moreover, CLOs are medium to long-maturity vehicles with stable liabilities. The average maturity is 8-10 years and, upon issuance, non-equity investors cannot redeem funds until maturity.[7] Still, CLO issuance collapsed to zero during both the Great Recession and the COVID-19 crisis. We use a mixture of anecdotal evidence and empirical analysis to show that a required increase in the share of the equity tranche explains the collapse in CLO issuance. In particular, increases in the riskiness of loans (the assets of CLOs) during periods of stress require commensurate increases in the equity cushion to maintain the investment-grade ratings of CLO senior tranches. This limits the leverage available to investors that invest in the equity tranche of CLOs (hedge funds and investment funds), reducing the appeal of CLO equity investments.[8] Consistent with this argument, CLO issuance dropped from $22.9 billion in February to 4.7 in April 2020, while the equity ratio at issuance rose from 3.4% to 13.9%. Moreover, precisely when their funds are most needed, equity investors face curtailed distributions from existing CLOs.

We furthermore find evidence for the fragility of open-end loan mutual funds. We document a positive and concave flow-performance relationship which points towards a first-mover advantage among investors, potentially making the funds susceptible to runs (Goldstein, Jiang, and Ng (2017)). This is consistent with Irani, Iyer, Meisenzahl, and Peydro (2020),

[6] DeMarco, Liu, and Schmidt-Eisenlohr (2020) show that about 65% of CLO tranches are held by insurance companies, banks, and pension funds.

[7] Equity investors usually have the option to call a deal after a predetermined date. However, the proceeds from selling the entire loan portfolio are first distributed to debt investors. Hence, there is no incentive to call a deal when secondary market prices are low.

[8] We essentially argue that one dollar of CLO equity capital produces less dollars of safe assets (the senior CLO tranches) during turbulent times. This reduces the value of securitization that accrues to CLO equity investors – the "CLO arbitrage" is reduced. Our explanation is similar to Moreira and Savov (2017) who study the macroeconomic implications of tranching.

who document a larger price decline for loans held by broker-dealers, hedge funds, and mutual funds than for loans held by pension funds and insurance companies during the Great Recession.

Our results have significant implications for macroprudential regulation and central bank policy. They point towards interventions that support nonbanks, in addition to banks, in order to restart lending during the COVID-19 crisis. Consistent with this, the Federal Reserve initiated minor actions during the COVID-19 crisis to support a part of the CLO market (static CLOs) through the TALF program, which spurred new static CLO issuances after the intervention. On the other hand, our results suggest that macroprudential regulation should take into account the risks emerging from the nonbank lending sector.

Related Literature. Our paper relates to five strands of the literature. The overarching implications for financial stability relate to a literature studying the presence and implications of the financial cycle vis a vis the business cycle (Borio and White (2004)). The literature gained particular prominence following the Global Financial Crisis, with several papers looking to understand the origins of financial cycles, namely credit and housing prices (e.g. Schularick and Taylor (2012), Gilchrist and Zakrajšek (2012)). Financial frictions and investor sentiment have been emphasized as the key channels that transform supportive financial conditions into boom-bust cycles (Brunnermeier and Sannikov 2014, He and Krishnamurthy 2013, Bordalo, Gennaioli, and Shleifer 2018, Greenwood and Hanson 2013, Greenwood, Hanson, and Jin 2019, Krishnamurthy and Muir 2017, Krishnamurthy and Li 2020, Lopez-Salido, Stein, and Zakrajsek 2017). Relative to the literature, we present concrete evidence on the institutions that are driving the credit cycle. Our results that nonbanks are particularly cyclical, despite being long-term financed and exhibiting a similar leverage ratio as banks, is especially informative for this literature. They also suggest that it is crucial to take into account the heterogeneity of investors and to pay attention to institutional details.

A separate but related literature studies the causes and, to a lesser extent, consequences of the rise of nonbanks. Several theoretical papers argue that the rise of nonbanks may increase financial fragility and reduce welfare (Shleifer and Vishny 2010, Plantin 2014, Farhi and Tirole 2017, Chretien and Lyonnet 2018). The empirical literature, however, is more limited. Irani, Iyer, Meisenzahl, and Peydro (2020), perhaps the closest paper to ours, documents the role of capital regulation in pushing syndicated lending activity to the shadow banking sector and analyzes the role of nonbanks in exacerbating price volatility in secondary markets. Finally, Cherenko, Erel, and Prilmeier (2018) show that nonbanks are responsible for almost a third of the direct lending to mid-sized businesses, and Gopal and Schnabl (2020) document the growing importance of nonbanks for lending to small businesses. Relative to prior work emphasizing the role of regulation on the rise of nonbank lenders, we study the implications of nonbank lending for financial stability. We also provide additional evidence on the sources for the fragility of nonbank lenders.

Yet another, large and growing literature studies the evolution of the syndicated lending market, often focusing on individual periods. Ivashina and Sun (2011) and Shivdasani and Wang (2011) focus on the 2002-2007 boom. They document how increased institutional participation created downward pricing pressures and led to increased LBO issuance. Ivashina and Scharfstein (2010a) document the drop in syndicated lending volumes during the Great Recession and argue that it is explained by deteriorating bank health, as measured by bank capital, liquidity, and credit losses. Santos (2010) showed that banks with weaker balance sheets increased their loan prices more and Irani and Meisenzahl (2017) find that these banks sold off more loans in the secondary loan market. Chodorow-Reich (2013) established the real effects of the lending decline during the Great Recession. Culp (2013) and Bruche, Malherbe, and Meisenzahl (2020) emphasize pipeline risk — i.e., the risk that a bank is unable to find investors for a loan after committing to origination. Relative to the existing literature, we take a long-run perspective and emphasize the role of nonbanks in explaining lending booms and busts over the last two decades.

Fourth, our paper contributes to the literature on the cyclicality of the syndicated loan market. Becker and Ivashina (2014) study how firms substitute between syndicated loans and bonds through the cycle, interpreting substitution away from loans as a decline in bank credit supply. In a similar analysis, Adrian, Colla, and Song Shin (2013) find that firms switch to bond financing during the Global Financial Crisis and interpret this as evidence that bank frictions were the main driver of the drop in lending. Ivashina and Scharfstein (2010b) argue that loan syndications amplify the credit cycle, because the lead bank is required to hold a larger loan share in bad times.[9] However, Blickle, Fleckenstein, Hillenbrand, and Saunders (2020) challenge this explanation by showing that the lead arranger sells its entire share for a large number of loans. Contrary to the existing literature, our results document that nonbank credit supply is in fact a more important driver of credit cyclicality in the syndicated loan market.

Our paper also contributes to the small but growing literature on CLOs and loan mutual funds. Benmelech and Dlugosz (2009) study the rating practices of CLOs and it's relation to collateral quality. Other studies focus on a potential information-asymmetry between originating banks and CLOs (Benmelech, Dlugosz, and Ivashina (2012), Bord and Santos (2015), Peristiani and Santos (2019)). We add to this literature by documenting the cyclicality of CLOs and proposing that the tranching of liabilities might be a crucial explanation for it. Moreira and Savov (2017) study the instability of tranching and it's implication for macroeconomic dynamics in a macro-finance model. Our paper is also related to some recent studies that have examined the fragility of open-end mutual funds. Goldstein, Jiang, and Ng (2017) and Morris, Shim, and Shin (2017) provide evidence for the instability of corporate bond funds.

The rest of the paper is organized as follows. Section 2 discusses the data. Section 3 presents the empirical strategy and our main results on nonbank lending cyclicality. Section 4 discusses the reasons for nonbank cyclicality. Section 5 concludes.

2 Data & Summary Statistics

2.1 Data Sources

We use loan issuance information from DealScan, CLO issuance data from Creditflux, and mutual fund flows from Morningstar. The main analysis examines syndicated *term* loans originated in the United States to non-financial companies originated between 2000 and 2020Q1.[10] We use the Excess Bond Premium from Gilchrist and Zakrajšek (2012) as a

[9] They acknowledge in the conclusion that these dynamics may in fact be driven by variations in nonbank credit supply, but provide no evidence for this mechanism.

[10] We show in the appendix that our results are robust to including credit lines. However, in our main analysis we exclude credit lines, because credit lines are not used to finance corporate investment, but instead

proxy for the financial cycle.

DealScan. Loan issuance information is gathered from Thomson Reuters DealScan, which compiles data on syndicated loan originations. Syndicated loans are large loans originated by more than one bank and sold to a syndicate of lenders. Single loan deals often contain multiple facilities – also called tranches. We follow Ivashina and Sun (2011) and classify term loan tranches either as *bank loans* (Term Loan and Term Loan A) or as *nonbank loans* (Term Loans B to K). Term loans B to K are by far the most common facilities held by nonbanks and more frequently traded in the secondary market. We provide further evidence for the bifurcation of the syndicated term loan market below.

Facilities are also assigned a loan purpose in the Dealscan data. We follow Ivashina and Scharfstein (2010a) and classify loans as *real investment* loans if their primary purpose is listed as "corporate purposes" or if the loans are used for working capital or capital expenditures. In some of our analyses, we restrict the sample to real investment facilities since these are most important for real effects (Chodorow-Reich 2013).

Creditflux. We obtain data on CLO tranches, holdings, and tests from Creditflux. Creditflux extracts data from monthly trustee reports that CLOs provide to their investors and captures the near universe of CLO holdings and tranches. Throughout this paper, we consider only CLOs that primarily invest in USD denominated syndicated loans. In order to construct a coherent measure of fund flows for section 3.3, we define flows to CLOs as changes in their aggregate AuM. This is the closest equivalent to mutual fund flows.

We furthermore examine the CLO equity ratio and CLO issuance in section 4. We define CLO issuance as the combined notional value of CLO tranches that are priced on a given date. The Credit Risk Retention rule as part of the Dodd-Frank Act required CLO managers to retain 5% of its liabilities on newly issued CLOs in 2016.[11] As a result, instead of issuing a new CLO, many CLOs repriced or reset their maturing liabilities in these years in order to issue new debt, while avoiding the risk retention rule. In order to construct a consistent time-series of CLO issuances, we, therefore, count resets and repricings of CLO tranches as

used mainly as a liquidity management tool by corporations.

[11]The ruling was overturned by U.S. courts in 2018.

new issuances. For this, we use the first date a reset or repriced tranche appears in Creditflux as the issuance date.

In order to provide evidence on the loans CLOs typically invest in, we merge CLO holdings data from Creditflux to DealScan based on a fuzzy match algorithm similar to Cohen, Friedrichs, Gupta, Hayes, Lee, Marsh, Mislang, Shaton, and Sicilian (2018). We match more than 6,000 loans with a combined volume of $3.14 trillion.

Morningstar. We obtain information on monthly flows of investment vehicles that are managed by mutual fund companies and primarily invest in USD denominated syndicated loans from Morningstar Direct.[12] These investment vehicles include open-end mutual funds, closed-end mutual funds, ETFs, and separate accounts. In the remainder of the paper, we refer to these investment structures simply as "mutual funds". We directly obtain monthly fund flows for open-end mutual funds and ETFs. For separate accounts and closed-end funds, we obtain monthly assets under management and approximate inflows and outflows by comparing monthly changes in the assets under management to the monthly returns of the S&P/LSTA Leveraged Loan Index. Our sample contains data on 82 open-end mutual funds, 45 closed-end mutual funds, 9 ETFs, and 45 separate account platforms.

2.2 Summary Statistics

Table 1 presents summary statistics for our key variables. We group the variables depending on the level of aggregation. Panel A shows statistics for aggregate variables at a monthly frequency. Panel B provides statistics for volumes and spreads on the loan facility level and the deal amount. Panel C summarizes bank-month level volumes for term loan types separately.

Panel A shows that, on average, $23.1 billion in Term B loans are originated per month compared to $13.6 billion in Term A loans. In the past 20 year, the average share of nonbanks in the syndicated term loan market was 56.3%. Net monthly flows to institutional investors were on average 6.6% of the size of the syndicated term loan market, with 6.9 billion in new

[12]These managed investments are classified in Morningstar as "US Fund Bank Loan", "US CE Bank Loan" and "US SA Bank Loan" (Morningstar Category).

CLO issuances during an average month. The equity tranche takes up, on average, 8.1% of the size of a newly issued CLO.

Panel B shows that at the loan level, Term B facilities are significantly larger than Term A facilities ($483 million vs. $180 million). On average, a deal consisting of one or multiple term facilities is $338.1 million (excluding credit lines). Roughly 44% of deals have a Term Loan B while 70% of deals include a Term Loan A. Term B loans are also, on average, more expensive than Term A loans (370 bps vs. 302 bps). The average maturity of facilities is 68.5 months for Term B loans and 56.1 months for Term A loans. We also measure the relationship of a borrower with its syndicate as the simple average of bank-borrower relationship strength across all syndicate members, where bank-borrower relationship strength is defined as the share of the borrower's loan volume in previous five years that has been provided by that bank. The average relationship is 13.5% for Term B loans and 11.1% for Term A loans.

Finally, Panel C, which reports monthly loan originations of banks, reports that banks originate on average more Term B loan volume (751 million) than Term A loan volume (361 million). The volumes are similar when we consider only loans in which the bank did not act as a lead arranger, but was a mere participant (174 million vs. 172 million).

3 Lending Cyclicality in the Syndicated Loan Market

3.1 The Syndicated Term Loan Market and Nonbank Lenders

Nonbank lenders have become important investors in the syndicated lending market.[13] As of the end of 2018, nonbank investors held about 66% of all syndicated term loans and 80% of the $1.2 trillion U.S. leveraged loan market (Lee, Li, Meisenzahl, and Sicilian (2019)). Nonbank lenders comprise a wide range of investors including hedge funds, pension funds, insurance companies, and asset managers. The most important institutional investors are CLOs and mutual funds. Together they managed about $770 billion in assets at the end of 2018, and hence, comprise about 80% of nonbank investments in syndicated lending.[14]

[13]Note that we use the term "nonbank lenders" and "institutional investors" interchangeably throughout the paper.

[14]Based on total liabilities and book equity of CLOs in Creditflux and total assets under management of mutual funds in Morningstar.

The goal of our paper is to compare the credit supply of institutional investors and banks in the syndicated loan market. Naturally, this poses the challenge of identifying their respective investments, which is difficult to achieve without accurate holdings data for every single investor. In order to overcome this challenge, we exploit the fact that banks typically invest in the amortizing Term A tranches of deals, whereas nonbank lenders buy the Term B tranches (that pay a bullet payment at maturity and hence resemble bonds). For this reason, Term B loans are often referred to as the institutional tranches of deals. While these two tranches differ in their amortization schedule, they are identical with respect to their seniority and collateral (Ivashina and Sun (2011)).

As noted above, we define Term A loans as bank loans and Term B loans as nonbank loans. Panel A of Table 2 provides support for this assumption using monthly CLO holdings data from Creditflux. We compare the distribution of syndicated credit across different facility types in a sample consisting of all terms loans in DealScan and a merged Creditflux-DealScan sample. Based on the Crediflux-DealScan sample, 95% of CLO holdings are in Term B, and only 5% in Term A loans. By contrast, Term B loans account for 66% of the value-weighted loans in the DealScan term loan sample, whereas Term A loans make up 36%.

Panel B of Table 2 classifies loans according to their purpose as stated in Dealscan. As shown, the distribution of loan purpose appears similar for bank and nonbank loans. About half of the credit is supplied for corporate purposes and working capital investments, while only around 6% of bank and 12% of nonbank loans fund financial engineering activities such as LBOs and recapitalizations. This illustrates that the credit supply of nonbank lenders is of similar importance for real activity as the credit supply of banks.

That said, nonbank lenders typically fund riskier firms. Panel C of Table 2 shows the distribution of Term B and Term A volumes across investment-grade and leveraged loans.[15] Institutional loan tranches provide more than 81% of their lending in the form of leveraged loans, compared to only 41% of bank lending in the form of leveraged loans. Nonetheless, there is a substantial overlap between bank and nonbank lending. 28.5% of borrowers receive loans from both banks and nonbanks lenders, with 20.2% receiving loans from both in the

[15] There is no uniform definition of leveraged loans. We follow Lee, Li, Meisenzahl, and Sicilian (2019) and define loans with an all-in-drawn spread of at least 225 basis points as leveraged loan and loans with spreads below 225 basis points as investment grade.

same deal. The overlap is concentrated in borrowers with a rating that is slightly below investment grade. Lee, Li, Meisenzahl, and Sicilian (2019), for example, report equal shares of bank and nonbank lending for BB-rated loans. We exploit the overlap for identification in section 3.2.2.

3.2 The Cyclicality of Nonbank Lending

3.2.1 Aggregate Analysis

We start by plotting the monthly origination of bank loans (Term A) and nonbank loans (Term B) from January 2000 to March 2020 in Figure 1.[16] Panel A of Figure 1 highlights two facts. First, the volume of nonbank lending has grown more than 10 times over the last two decades. Second, there is greater volatility in nonbank lending over the business cycle. Panel B highlights the second point more clearly. We de-trend the new loan originations using a HP-filtered series. We see that lending by nonbanks is more cyclical - growing more than banks in booms and declining more in busts.

Figure 2 relates the cyclicality of nonbank lending to the broader credit cycle, as proxied by the Excess Bond Premium of Gilchrist and Zakrajšek (2012). As shown in Panel A, the share of nonbank originations correlates negatively with the Excess Bond Premium. The nonbank share declines when economy-wide credit conditions tighten and rises when credit conditions ease. The correlation of −70% illustrates the robustness of this relationship. Evidence on loan prices as shown in Panel B of Figure 2 is consistent with this argument: the spread on nonbank facilities rises *relative* to bank ones when credit conditions tighten, consistent with a relative contraction of nonbank lenders' credit supply.

We conduct a formal regression analysis to document these relationships by estimating

$$\text{Lending Outcome}_{ft} = \beta_0 + \beta_1 \text{Credit Cycle}_{t-1} + \beta_2 \mathbb{I}_{f=\text{TermB}} + \beta_3 \text{Credit Cycle}_{t-1} \times \mathbb{I}_{f=\text{TermB}} + \epsilon_{ft}, \tag{1}$$

where the dependent variable $\text{Lending Outcome}_{ft}$ is either (a) the average (loan-amount-

[16] The sample is restricted to real investment loans to focus on the market where both banks and nonbanks frequently participate in the same deal.

weighted) all-in-drawn spread of all newly originated loans of type f in month t or (b) the logarithm of the aggregate issuance volume of loans that are of type f in month t. Loan type f separates bank (Term A) and nonbank (Term B) loans. β_1 quantifies the sensitivity of bank loan outcomes to the credit cycle, while β_3 measures the differential cyclicality of nonbank lenders relative to banks.

We use the Excess Bond Premium as our main credit cycle variable.[17] Gilchrist and Zakrajšek (2012) construct the Excess Bond Premium by combining secondary market prices of corporate bonds with firm-specific information on expected default. A firm's credit spread is then decomposed into a component that reflects default risk and a residual spread component. These residual spreads are then averaged across all firms to obtain a measure of the aggregate credit risk premium, called the Excess Bond Premium.

As such, the Excess Bond Premium possesses several features that are advantageous for our analysis. First, because it is derived from corporate bond prices, it provides a measure of the financial cycle that is constructed outside of the loan market.[18] Second, the Excess Bond Premium, by construction, reflects the financial component of credit spreads and can be interpreted as the risk premium that investors require for holding risky corporate bonds. It therefore provides a good proxy for economy-wide credit supply that is largely independent of the underlying macroeconomic conditions that might drive credit demand. Third, as Gilchrist and Zakrajšek (2012) show, the Excess Bond Premium has strong predictive power for future economic activity beyond other macroeconomic variables. This suggests that our results have important implications for the real economy.[19]

Table 3 presents the results of estimating Equation 1. Column 1 of Table 3 shows that a one standard deviation increase in the Excess Bond Premium coincides with a 50.9% decrease in total loan originations (Panel A) and a 38.8 basis points increase in loan spreads (Panel

[17]The appendix presents results for alternate measures of credit conditions, including the GZ spread, the VIX, and the high yield bond spread. All results are robust to these alternate measures of credit conditions.

[18]There is likely some overlap between the bond and the loan market as some borrowers might access both the leveraged loan market and the high-yield bond market. While it is not crucial for our analysis that the Excess Bond Premium is independent from the conditions in the loan market, we show in the appendix that our results are robust to using various alternate credit cycle measures, such as the VIX, and to focusing only on private borrowers, i.e. borrowers that in most cases access only the syndicated loan market.

[19]We abstain from any analysis examining real outcomes on the firm-level, as there exists ample evidence that financial conditions affect real outcomes of firms, see for example Chodorow-Reich (2013) and Huber (2018).

B). This suggests that lending conditions in the syndicated term loan market strongly co-move with the credit cycle. Column 2 splits bank and nonbank loans (i.e., it follows the specification in equation 1). β_1 – which now measures the cyclicality of bank originations – falls by half for both quantities and prices (in absolute terms), while $\beta_1 + \beta_3$ illustrates the higher cyclicality of nonbank originations. A one standard deviation increase in the Excess Bond Premium is associated with a reduction in nonbank lending of 80.4%, compared to a reduction of only 22.8% for banks. Prices exhibit similar results (Panel B): the sensitivity of loan spreads on institutional loans is nearly five times that of bank loans (65.0 versus 13.8). These results are robust to including year-month fixed effects that control for macro conditions (Column 3).

3.2.2 Within-Deal Analysis

Since loan spreads and quantities move in opposite directions, these results point towards credit supply as the driver of cyclicality.[20] However, they may also be explained by differences in borrower loan demand if firms typically borrowing from nonbanks are more cyclical than firms borrowing from banks. We therefore control for borrower demand and loan characteristics, such as borrower riskiness, by exploiting the overlap between bank and nonbank lending.

We estimate within-deal regressions in the style of Khwaja and Mian (2008) and Ivashina and Sun (2011):

$$\text{Lending Outcome}_{idft} = \delta_{idt} + \beta \text{Credit Cycle}_{t-1} \times \mathbb{I}_{f=\text{TermB}} + \epsilon_{idft} \tag{2}$$

where Lending Outcome_{idft} is either (a) a loan indicator, (b) the logarithm of the loan issuance volume or (c) the all-in-drawn spread at origination to borrower i for deal d, tranche-type f which is either a Term A loan or Term B loan, in month t. As before, we use the Excess Bond Premium as the credit cycle variable. We include controls for the maturity

[20] An alternative explanation is that the credit risk of borrowers changes as a result of incoming fundamental information. Weak fundamental information might lead to an increase in credit spreads and lower borrowers' credit demand. This would also create a negative relation between loan spreads and loan quantities.

of facility f and the borrower's relationship to the facility's syndicate. For the former, we interact the logarithm of maturity in months with the Term B dummy to rule out that our results are driven by differences in loan maturities among facilities within the same deal. For the latter, we calculate the share of loan volume to the borrower in the previous five years provided by a lender, take the average across all syndicate members per facility, and interact it with the Excess Bond Premium and the Term B dummy.[21] This allows us to control for an alternative explanation wherein banks cut lending less than nonbanks during bad times because of their stronger relationships with borrowers.

Given the inclusion of deal fixed effects δ_{idt}, identification comes from comparing bank and nonbank facilities allocated to the same borrower within the same deal. Our specification controls for borrower credit demand and loan characteristics, such as loan riskiness. Given that bank and nonbank loans in the same deal represent claims to the same cash-flows under the same contract, it is unlikely that relative changes in loan quantities or spreads are determined by an unobservable factor that varies with the credit cycle. We interpret the regression coefficient β as the differential impact of nonbank lenders' credit supply on lending quantities and prices when economy-wide credit conditions change.

Panel A of Table 4 examines the extensive margin of receiving a loan, Panel B focuses on lending quantities, while Panel C looks at loan spreads. In Columns 1-3 of Panel A, we create a fully balanced panel for all borrowers x month pairs in our sample between January 2000 and March 2020 (We do not directly follow specification 2). The dependent variable takes a value of zero if the borrower has no loans in that month and a value of 100 if it has a loan, i.e. it reflects the probability of a loan origination in percentage. Column 1 of Panel A shows that an increase in the Excess Bond Premium reduced the likelihood of a borrower receiving a loan. Column 2 interacts the Excess Bond Premium with an indicator for Term B facility. It shows that a one standard deviation increase in the Excess Bond Premium reduces the likelihood of a borrower receiving a Term B loan by 4.6 basis points *relative* to a Term A loan. In Column 4 we return to a deal-level analysis and follow specification 2. We therefore compare the relative likelihood the loan is a Term A or Term B facility conditional

[21] Our results are robust to using various other definitions of bank-borrower relationship strength (see Appendix Table A5).

on the borrower receiving a credit. Column 4 suggests that a one standard deviation increase in Excess Bond Premium reduces the relative likelihood of receiving a Term B loan by 18.7 percentage points.

Column 1 of Panel B reveals that a one standard deviation increase in Excess Bond Premium coincides with a reduction of 11.3% in total lending quantities for the same borrower. Splitting by loan type in Column 2 shows that this effect is substantially larger for nonbank loans. A one standard deviation increase in the Excess Bond Premium decreases the size of Term B loans by 14.0 percentage points more than that of Term A loans, for the same borrower. Again, this reduction is robust to including year-month (Column 3) and deal fixed effects (Column 4). A one standard deviation increase in Excess Bond Premium leads to a 16.7 percentage point difference in loan quantities between Term A and Term B facilities when comparing lending to the same borrower at the same time within the same deal. Comparing the regression coefficients in Column 2 and Column 4, we conclude that nonbank loan origination is more than three times as cyclical as bank lending.[22] The robustness of our results to the inclusion of loan maturity and relationship controls (Column 5) shows that our results are neither explained by the difference in maturities between Term A and Term B facilities nor differences in the strength of borrower-syndicate relationships.

Panel C presents similar results for loan pricing. Column 1 shows that a one standard deviation increase in the Excess Bond Premium coincides with an increase in loan prices of 20.8 basis points. Column 2 interacts the Excess Bond Premium with an indicator for Term B facility. A one standard deviation increase in Excess Bond Premium leads to an increase in Term B loan spreads of 60.7 basis points *relative* to Term A loan spread, for the same borrower. The *relative* increase rises to 77.1 basis points when including deal fixed effects (Column 4) and is robust to adding maturity and relationship controls (Column 5). We also note that the coefficient on the Excess Bond Premium in Column 2 - reflecting the sensitivity of bank loan pricing - is close to zero. This suggests that the entire loan pricing cyclicality

[22]Note that the coefficient on the Excess Bond Premium in Column 2 – which reflects the cyclicality of bank lending – is not well identified: it captures the effect of credit demand and credit supply. Because both of these forces would pull down lending volumes in bad times and drive up lending in good times, the coefficient essentially represents a lower bound for the credit supply cyclicality of banks. When comparing the coefficient in Column 4, which is well identified, with this lower bound, we can reach the conclusion that nonbank credit supply is 3.45 (=23.5/6.8) times as cyclical as bank credit supply.

is driven by nonbank lenders.

Taken together, these results indicate that nonbank credit supply is, by several orders of magnitude, more cyclical than bank credit supply. Term B facilities are less likely to be originated, smaller, and more expensive when credit conditions tighten – even after controlling for borrower demand.

Robustness. We provide various robustness checks in the appendix. First, we show that our results are unchanged when using alternate credit cycle measures, such as the VIX, the high-yield spread and the GZ spread from Gilchrist and Zakrajšek (2012) (Table A1). Second, our results also hold when we focus on real investment loans (Table A2). This eliminates any concern that our results are driven by leveraged buyouts or refinancing activity. Third, our results are similar, if not stronger, when comparing nonbank (Term B) loans to not only Term A loans, but to all loans that are provided by banks, most importantly credit lines (Table A3). Forth, the results are robust to excluding public borrowers, which shows that our finding is not due to firms switching to the bond market (Table A4). Finally, we report results for different measures of borrower-lender relationships (Table A5).

3.3 Nonbank Lending Cyclicality and Fund Flows

3.3.1 Aggregate Analysis

In order to shed light on the channel through which economy wide credit conditions impact the share of nonbank loan originations, we connect changes in primary market originations to changes in the availability of funds for the two main nonbank investors of the syndicated lending market: mutual funds and CLOs.

We define institutional fund flows as the dollar amount of net flows to mutual funds and changes in CLO assets under management in a given month. We divide this value by the average monthly dollar amount of all issued term loans over the last 12 months to get a measure of fund flows relative to the current size of the loan market. Since CLOs and mutual funds comprise almost 80% of nonbank investments in the syndicated lending market, these flows are a good proxy of the funds available to nonbank lenders.

Figure 3 compares the fund flows to credit conditions and the share of nonbank lending.

Panel A shows that flows into CLOs and mutual funds are strongly negatively correlated with the Excess Bond Premium. Outflows occur when credit conditions are tight, while inflows occur in times of ample credit availability. Variation in the Excess Bond Premium explains about 24% of the variation in relative fund flows on a monthly level, as shown in Panel A of Table 5, and 38% of the variation on a quarterly level (not reported).

Panel B of Figure 3 documents that fund flows are strongly positively correlated with the nonbank lending share in the syndicated term loan market. When nonbanks experience inflows, a large volume of Term B loans is originated. When nonbanks experience outflows, the share of nonbank lending declines – often reaching close to zero. Together with the fact that fund flows are positively correlated with the credit cycle, we interpret this as suggestive evidence that the cyclicality of fund flows is a main driver of fluctuations in syndicated term loan originations.

We test this formally with a two-stage least square regression, where we instrument fund flows with the economy-wide credit cycle variable. Instrumenting fund flows with the Excess Bond Premium allows us to extract the part of fund flows that has a pure financial origin. Specifically, we run the following regression:

$$\text{Fund Flows}_t = \alpha + \gamma \text{Credit Cycle}_t + \epsilon_t \tag{3}$$

$$\text{Lending Outcome}_{ft} = \delta + \beta \widehat{\text{Fund Flows}}_{t-1} \times \mathbb{I}_{f=\text{TermB}} + \epsilon_{ft} \tag{4}$$

where Fund Flows_t are the flows to CLOs and mutual funds in month t relative to the average size of the syndicated lending market in the previous 12 months. Credit Cycle_t is the Excess Bond Premium in month t. Lending Outcome_{ft} is either (a) the average (loan-amount-weighted) all-in-drawn spread of all newly originated loans of type f in month t or (b) the logarithm of the aggregate issuance volume of loans that are of type f in month t.

The coefficient of the first stage (Panel A of Table 5) reveals that a one standard deviation increase in the Excess Bond Premium is associated with a 0.49 standard deviation decline in institutional fund flows. This confirms the strong pro-cyclicality of fund flows apparent in Figure 3. Panel B report the results of the second-stage for loan volumes and spread, respectively. A one standard deviation increase in fund flows is associated with an increase of aggregate nonbank loan originations that is 116.1 percentage points larger than that of bank loans (Column 3). Moreover, a one standard deviation increase in institutional fund flows is correlated with a decline in loan spreads that is 104.2 basis points larger for institutional term loan tranches than for bank tranches (Column 6).

3.3.2 Within-Deal Analysis

After presenting aggregate evidence, we conduct a within-deal analysis in order to better identify the impact of fund flows on loan issuances on the primary market. Essentially, the analysis we conduct here is the same as the two-stage regression above, however the second stage is now on the deal level.

$$\text{Fund Flows}_t = \alpha + \gamma \text{Credit Cycle}_t + \epsilon_t \tag{5}$$

$$\text{Lending Outcome}_{idft} = \delta_{idt} + \beta \widehat{\text{Fund Flows}}_{t-1} \times \mathbb{I}_{f=\text{TermB}} + \epsilon_{idft} \tag{6}$$

where Fund Flows$_t$ are the flows to CLOs and Mutual funds in the month t relative to the average size of the syndicated lending market in the previous 12 months. Credit Cycle$_{t-1}$ is the Excess Bond Premium in month $t-1$ and Lending Outcome$_{idft}$ is either the aggregate loan volume or weighted-average spread at origination of term loan tranche f, which is a Term A or a Term B loan, in deal d originated in month t to borrower i.

As in section 3.2.2, we control for borrower-level differences in demand or credit risk with a deal fixed effect and we include controls for the facility's maturity and the borrower's relationship to the facility's syndicate. Our exclusion restriction is that credit conditions do not differentially affect the origination of Term A and Term B facilities within the same deal except through flows to institutional investors.

The results are shown in Table 6. Column 1 examines the extensive margin of receiving a loan, Columns 2-3 focus on lending quantities, while Columns 5-6 looks at loan spreads. In our tightest specification, we find that a one standard deviation decrease in institutional flows – driven by changes in the credit cycle – results in a a 28.5 percentage point lower likelihood obtaining a nonbank loan facility for the same borrower in the same deal; as well as a 19.4 percentage point smaller loan, and 98.5 bps higher spread of the nonbank tranche *relative* to the bank tranche.

Taken together, we see that when credit conditions tighten, there is a decline in flows to institutional investors, and this, in turn, affects the origination of Term B facilities. Term B facilities drop in volume and increase in cost, even to the same borrower in the same deal. Our results illustrate the impact of changes in fund flows on credit supply in the loan market. Because fund flows are highly cyclical, credit supply in the syndicated term loan market is cyclical as a result.

3.4 Alternative Hypothesis: Bank Health

In this paper we want to argue that nonbanks' credit supply in the syndicated loan market is substantially more cyclical than that of banks. So far, we have shown that volumes of institutional loan tranches are far more cyclical than tranches that are bought by banks, even after controlling for borrowers' loan demand. In this section, we rule out alternative explanations that are motivated by banking frictions. We provide several pieces of evidence that are inconsistent with these alternative hypotheses.

Identification. By focusing on credit provisioning by banks and nonbanks to the same borrower and at the same time, our analyses control for borrower demand and borrower credit risk. An alternate hypothesis, however, is that banks themselves are driving the cyclicality of nonbanks. There are two flavors to this story.

First, if nonbanks are merely marginal investors invited to participate in a syndicate *after* bank lending capacity is exhausted, a large enough reduction in borrower demand may leave no room for nonbanks. This, however, is inconsistent with our results. Table 3 and 4 show that *relative* nonbank prices rise and quantities fall over the credit cycle. A reduction in investment opportunities for nonbanks, as banks limit credit offerings, would lead to a relative compression, not blow up, of spreads.

Second, participating in the syndicated lending market requires balance sheet and liquidity capacity from banks. Banks are exposed to pipeline risk (Bruche, Malherbe, and Meisenzahl 2020) and typically retain the bank term-loan and credit line facilities.[23] If more

[23]When acting as lead banks, they may also retain a lead share in order to preserve monitoring incentives

cyclical banks specialize on syndicating Term B loans, whereas more stable banks tend to participate in Term A loans, one might expect a switch from Term B to Term A lending in periods when general credit conditions tighten. This would be independent of nonbank lenders' credit supply and be entirely due to banks specialized in Term B originations reducing their balance sheet capacity. Hence, the specialization of more cyclical banks on the syndication of Term B loans would be consistent with our results. However, under this alternative hypothesis one should then expect that Term B and Term A volumes behave similarly *within* banks, i.e. after controlling for the stability of the originating bank's balance sheet. If Term B originations require lower balance sheet capacity because they will be eventually sold, one would expect greater Term B originations *within* banks in bad times under this alternative hypothesis. Thus, if bank balance sheets are the driver of Term B originations rather than nonbank investors' credit supply, then Term A should be as, or more, cyclical *within* banks.

We test for this hypothesis with the following regression model:

$$\text{Lending Outcome}_{bft} = \delta_{bt} + \beta \text{Credit Cycle}_{t-1} \times \mathbb{I}_{f=\text{TermB}} + \epsilon_{bft} \tag{7}$$

where Lending Outcome_{bft} is the origination volume of bank b in form of term loan tranche f at time t. To compute lending volumes on the bank-month level, we allocate the amount of each loan facility originated in a month equally across all syndicated members of the loan facility.[24] Again, we use the Excess Bond Premium as a measure of the credit cycle in our baseline specification.

Table 7 presents the results. The coefficient in Column 1 indicates that a one standard deviation increase in the Excess Bond Premium reduces bank-level lending by on average 24.6% for Term A loans and 54.6% for Term B loans. A difference of more than 33.0 and 34.9 percentage points remains when controlling for bank fixed effects in Column 2 and bank x year-month fixed effects in Column 3 respectively. This suggests that independent of banks' individual sensitivity to the credit cycle, banks reduce Term B originations about 2-3 times

(Ivashina 2009, Sufi 2007). Blickle, Fleckenstein, Hillenbrand, and Saunders (2020) question this "conventional wisdom" by showing that lead arrangers sell their entire loan share for a large number of loans after origination.

[24] This is a standard procedure in the literature as lending shares are sparsely populated in Dealscan.

as strongly as Term A originations when credit conditions tighten. This is robust to including controls for the average loan maturity and the average bank-borrower relationship per tranche type in Column 5. Moreover, the magnitudes are almost identical to the aggregate results in Table 3. We therefore conclude that our previous finding that institutional term tranches are more cyclical than bank tranches is not driven by frictions that vary on the bank level.

Similarly, Panel B of Table 7 shows that bank loan pricing is sensitive to aggregate credit conditions, particularly for Term B loans. A one standard deviation increase in Excess Bond Premium increases the price of Term B loans by 21.5 basis points more than Term A loans (Column 1). When including bank fixed effects (Column 2) or bank x year-month fixed effects (Column 3), the pricing of Term B loans increases by 20.6 basis points and 27.4 basis points for a one standard deviation increase in the Excess Bond Premium. Again, this effect is only slightly attenuated when including maturity and relationship controls (Column 5)

Ivashina and Scharfstein (2010b) argue that lead arrangers, who are tasked with monitoring the loan, have to retain a larger share of a loan when credit conditions tighten, adding to the cyclicality of the syndicated loan market. If lead arrangers mainly have"skin-in-the-game" by retaining Term A tranches, then bank health might influence our results. To alleviate this concern, Column 4 excludes commitments as lead arranger, to focus purely on the activity as syndicate member which is unaffected by changes to the lead share. Term B originations still appear significantly more cyclical than Term A originations.

Great Recession. These results suggest that nonbank dependence may be an important driver of the decline in bank-level originations during periods of stress. To study this hypothesis, we run a horse race between nonbank dependence and measures of bank health in explaining changes in originations during the Great Recession. In particular, we gather changes in originations and measures of bank health from Chodorow-Reich (2013), and define nonbank dependence as the percentage of originated deals that include a nonbank facility for each bank before the onset of the Great Recession. As shown in Table 8, nonbank dependence is far more correlated with declines in bank-level originations during the Great Recession than the measures of bank health commonly used in the literature. In fact, after controlling for nonbank dependence, measures of bank health are not significantly related to changes in originations. Moreover, nonbank dependence alone can explain 34% of the variation of loan volume changes across banks.

The timeline of syndicated lending during the Great Recession, shown in Panel A of Figure 4, confirms the notion that nonbanks were responsible for a large part of the decline in syndicated lending. First, the lending decrease between 2007Q1 and 2008Q3 was almost entirely due to a fall in nonbank loan origination. Second, after Lehman Brothers failed, nonbank lending dropped to near zero in 2008Q4 and remained there for several quarters, while bank lending remained well above zero. This brings new light to our understanding of bank lending during the Great Recession.

COVID-19. Next, we examine syndicated lending during the COVID-19 crisis in 2020Q1. For this purpose, we plot nonbank lending and bank lending in the form of syndicated term loans during COVID-19 on a weekly basis in Panel B of Figure 4. We obtain the S&P LSTA Leveraged Loan Price Index as a measure of market conditions in the secondary loan market. At the beginning of the year, nonbank lending was strong with a record weekly issuance of USD 44 billion at the end of January. When the United States reported its first death on February 29, secondary market prices were still above 95 and nonbank loan originations were still fairly high at USD 9 billion in the first week of March. However, as the number of COVID-19 cases rose, the secondary market loan prices dipped precipitously. At the same time, nonbank loan issuance dried up, declining to below USD 2 billion per week. The first Fed interventions occurred in the form of the Commercial Paper Funding Facility and the Primary Dealer Credit Facility on March 17, and the Money Market Funding Facility March 18 but did not provide sufficient support for the loan market and loan prices continued to drop. Finally, the second Fed intervention in the form of a corporate bond purchase program reversed the direction of loan prices. However, despite rising secondary market loan prices nonbank lending remained subdued - only slightly recovering to USD 2.7 billion in the second week of April. Remarkably, bank lending increased during the COVID-19 crisis and bank loan originations jumped markedly after the second Fed intervention. This occurred despite banks simultaneously providing liquidity through credit line drawdowns (Acharya and Steffen (Forthcoming)). The timeline around COVID-19 illustrates how quickly and sharply nonbank credit availability changes. It also shows that banks are (at least partly) unable or unwilling to step in and close the gap left by nonbanks even when they remain well-capitalized. Moreover, our analysis shows that the Fed interventions were not particularly successful in restarting nonbank lending.

4 Reasons for Nonbank Lending Cyclicality

Next, we discuss the reasons for the cyclicality of nonbank credit supply. We focus on the two largest nonbank investors in the market: CLOs and open-end mutual funds, which comprise slightly less than 80% of nonbank investments.[25] We present a mixture of anecdotal evidence and analysis, but leave more detailed studies for future research.

4.1 Collateralized loan obligations (CLOs)

We begin with CLOs. CLOs are actively managed funds that frequently buy and sell loans, are typically affiliated with credit hedge funds or private equity companies, and issue securities with a maturity of several years. Their funding, therefore, is fairly stable: the capital is locked in for several years and cannot be redeemed.[26]

CLOs tranche their liabilities into different seniorities with ratings ranging from AAA to B. The residual claim constitutes the equity tranche, which typically comprises about 8% of a CLO's notional value. The main purpose of tranching is to exploit the convenience yield for safe assets (Gorton and Metrick (2013)) and to cater to different investors with varying risk-return preferences.[27] For CLOs specifically, the tranching creates highly rated securities

[25]We ignore closed-end mutual funds and ETFs because they are relatively unimportant in terms of their size. We focus our analysis on open-end mutual funds and leave out separate accounts, because concerns have been raised about the stability of open-end mutual funds, see for example the *Investment Company Liquidity Risk Management Program Rules* implemented by the SEC. Link: `https://www.sec.gov/divisions/investment/guidance/secg-liquidity.htm`.

[26]An exception is that equity holders can call a deal if the CLO is outside the call period. However, CLO equity investors do not have an incentive to do so when secondary market prices of loans are low, because when a deal is called, proceeds from selling the portfolio assets are first used to fully repay the more senior investors, i.e. the holders of the debt tranches. This means that the proceeds paid to the equityholders would be low when loan prices are low.

[27]DeMarzo (2005) proposes another main purpose for tranching: The creation of information insensitive securities. However, this is unlikely to play a major role for CLOs, because banks that originate many of the underlying loans are also the investors in the information insensitive securities.

that allow investors with high regulatory capital charges for risky investments, such as banks and insurance companies, to be major CLO investors. As of 2018, almost 40% of U.S. CLOs' most senior tranches —which typically constitute 60-65% of a CLO's notional value— were held by U.S. banks.[28] Together, U.S. banks and insurance companies held about 65% of U.S. CLO's debt (DeMarco, Liu, and Schmidt-Eisenlohr (2020)).

Tranching, however, introduces significant risks for new issuances. Increases in the riskiness of loans during periods of stress require commensurate increases in the equity cushion to maintain the investment-grade ratings of senior tranches. In extreme cases, it requires the substitution of B- and BB-rated tranches with equity, thereby limiting the leverage available to equity investors, i.e. making the "CLO arbitrage" less attractive. This reduces the appeal of the investment vehicles for equity investors, leading the securitization process to collapse.

Figure 5 provides evidence consistent with this. The graph plots the aggregate six months moving average of CLO issuance and equity ratios (at issuance). As shown, the two series are strongly negatively correlated with a correlation coefficient for the raw series of about -0.65, which is statistically significant at the 1 percent level. The equity ratio increases sharply during periods of stress, leading issuance to collapse. Consider the recent COVID-19 period. In February 2020, $24.0 billion of CLOs were issued with an average equity ratio of 3.4%. By April 2020, issuances dropped to $3.4 billion while the average equity ratio increased to 13.9%. The share of CLOs issuing B- or BB-rated tranches fell from 61.5% to 25.0%.

Amit Roy, head of the U.S. CLO New Issue business at Goldman Sachs provides further support for our explanation when asked about the lack of new issuances during the COVID crisis:[29]

"There are real concerns about [...] tranche downgrades, increasing capital requirements for investors that might then sell [...]. This is widening pricing to a level, where it is not acquisitive to issue BBs necessarily on a new issue transaction, which then impacts the leverage equity can achieve."

How is this different from banks? Popular theories on the cyclicality of bank credit supply incorporate a fixed net worth constraint, which is typically motivated with agency frictions

[28] In addition, Japanese banks are a major investor in CLO debt as well.

[29] See Creditflux webinar "US CLO Outlook" on https://events.creditflux.com/us-clo-outlook/live

or regulatory constraints and is usually assumed to be constant (see e.g. Brunnermeier and Sannikov (2014)).[30] When a sufficiently strong negative shock hits, the constraint becomes binding, and banks have to delever and therefore reduce credit supply. For CLOs, the same mechanism might be amplified due to the aforementioned countercyclical equity constraint. If tranching requires CLOs to have more equity when a negative shock hits, then this makes not only the equity constraint more likely to bind for a given shock but also increases the required deleveraging. Therefore, the tranching of liabilities, which allows CLOs to attract funds from investors with specific risk-return preferences in normal periods, bites back during periods of higher volatility.

Moreira and Savov (2017) provide a macro-finance model where securitization collapses when uncertainty rises, leading do a decline in economic activity. When uncertainty is low, the tranching of liabilities in quasi-safe assets allows credit supply to expand, leading to a boom. When uncertainty rises, credit supply and economic activity contract sharply because the creation of quasi-safe assets through tranching is inhibited. They emphasize the creation of information-insensitive securities as the main reason for tranching, whereas our argument indicates regulatory purposes. However, the implications are similar. More uncertainty requires more collateral (i.e., equity) in order to create sufficiently safe assets.

Contractual requirements in CLOs may also hamper new issuances. In order to preserve the safety of senior tranches, CLOs self-impose certain rules. One of those rules is the overcollateralization test, which requires a minimum ratio of CLO assets to debt tranches. When the overcollateralization test is breached, cash flows from the underlying loans are redirected away from equity investors towards senior holders. This reduces the funds available to equity investors precisely when they are needed most. A recent news article by Reuters suggests a similar mechanism:[31]

"Hard to see the market fully reopen when CLO equity investors are not getting full repayments."

Such breaches of collateralization tests have been very frequent during the COVID-19

[30] By "fixed net worth constraint" we mean that the ratio of collateral to debt is usually assumed to be fix over time.

[31] https://www.reuters.com/article/cloissuance-ccc/clo-issuance-falls-48-as-rush-of-loan-downgrades-threatens-investor-distributions-idUSL1N2C50BG

crisis. Almost 24% of all U.S. CLOs that invest in syndicated loans reported a failure of overcollateralization tests between March 1 and May 14, 2020, whereas only 2.7% of all CLOs did so in the prior three months.

4.2 Open-End Loan Mutual Funds

While the capital in a CLO is typically locked-in for several years, investors in open-end mutual funds have the option to deposit or withdraw funds on a daily basis. Specifically, shares of open-end mutual funds can be purchased or redeemed at the net asset value at the end of each trading day, and these redemptions are usually settled on the following business day. Changes in investor preferences and beliefs, therefore, may lead to drastic outflows during periods of stress.

Institutional details might further exacerbate the cyclicality of fund flows. Syndicated loans have a target settlement period of T+7, yet the average settlement time is often longer.[32] This introduces a significant liquidity mismatch between the assets and liabilities of open-end mutual funds. Furthermore, loans usually have high bid-ask spreads – especially during periods of stress – making it expensive for mutual funds to fulfill redemptions with loan sales.[33] As such, investor redemptions might impose costs on the remaining investors and this might give investors an incentive to "run". Theoretical research has highlighted this fragility, which is also supported by recent evidence for corporate bond funds (Morris, Shim, and Shin (2017), Goldstein, Jiang, and Ng (2017)) and money-market funds (Kacperczyk and Schnabl (2013)).

We test for the fragility of open-end mutual funds by estimating the flow-performance relationship on the individual fund level. We gather assets-under-management (AuM), flows, returns, and fund age (in years) from Morningstar. We follow Goldstein, Jiang, and Ng (2017)

[32] It took on average 19.3 days to settle loan transactions in 2016Q1 (see https://www.reuters.com/article/us-loan-settlement/lpc-loan-market-pushes-forward-to-cut-settlement-times-idUSKCN0Y323Y)

[33] The average bid-ask spread for traded syndicated loans was 0.76% between 2002-07, while it rose to 5.5% at the peak of the Great Recession. These numbers are based on dealer quotes in the LSTA data.

and estimate

$$\text{Flows}_{ft} = \beta_0 + \beta_1 \alpha_{ft-1} + \beta_2 \alpha_{ft-1} \mathbb{I}_{\alpha_{ft-1}<0} + \text{Fund Controls}_{ft-1} + \gamma_t + \varepsilon_{ft} \qquad (8)$$

where Flows_{ft} are the flows of fund f in month t relative to the fund's AuM in the previous month. Our main explanatory variable α_{ft-1} measures either the fund's return over the past month or the fund's relative performance (alpha) measured over the last 12 months.[34] We interact alpha with the dummy variable $\mathbb{I}_{\alpha_{ft-1}<0}$ which is equal to one if the alpha measured over the past year is negative and zero otherwise. The regression coefficient β_2 indicates whether the flow-performance relationship is concave. We include lagged flows, lagged AuM, lagged age, and month fixed effect as controls.

The results of our analysis, reported in Table 9, shows that fund flows react strongly to fund performance. Column 1 shows that a -10% return in the past month leads to outflows of 2.6% (in terms of past AuM), on average, suggesting that changes in investor preferences lead to a reduction in available funds during periods of stress. Column 2 adds year-month fixed effects in order to compare outflows cross-sectionally across funds. It shows that investors pull funds from underperforming funds. This results is confirmed when we use alpha as the performance measure in Column 3. Column 4 follows specification 8 and tests whether the flow-performance relationship is stronger when the fund underperforms. We find a positive and significant coefficient, implying that the relationship between flows and performance is concave. This means that fund flows are more sensitive to performance when fund performance is weak. We interpret this as suggestive evidence for the financial fragility and the risk of runs for open-end loan mutual funds.

5 Conclusion

We show that the growing presence of nonbanks in the syndicated lending market has increased the cyclicality of originations. Nonbanks cut originations and increase loan spreads more than banks when credit conditions tighten – for the same borrower in the same deal.

[34] We obtain the fund alpha by regressing fund returns over the last 12 months on returns of the most widely-used benchmark in the loan market: the S&P/LSTA Leveraged Loan Index.

Our findings have important implications for financial stability and macro-prudential policy: Financial regulation which ignores the role that nonbanks play in lending markets likely leads to the build-up of financial imbalances and may exacerbate boom-bust cycles. Our results also points towards interventions that support nonbanks, in addition to banks, in order to restart lending during the COVID-19 crisis. This is consistent with minor actions initiated by the Federal Reserve during the COVID-19 crisis, which supported a part of the CLO market through the TALF program. Yet additional research is needed to design optimal interventions.

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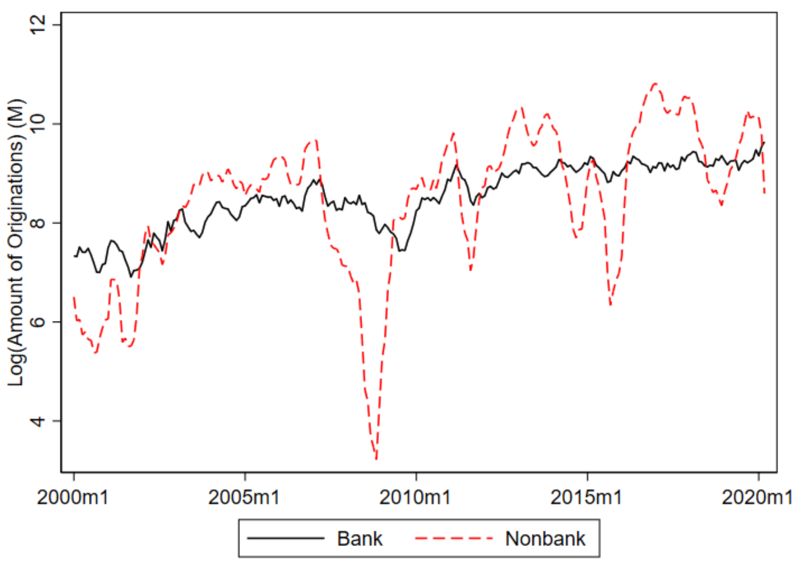
Figures

Figure 1: Cyclicality of Originations: Nonbank vs. Bank Lending

This figure shows new loan originations of loans by banks and nonbanks between 2000Q1 and 2020Q1. Panel A plots the logarithm of the total origination amount for bank and nonbank loans. Panel B shows the HP-filtered series. Both series are smoothed using a six-month forward-looking moving average and include only real investment term loans to focus on the segment of the market where banks and nonbanks coexist. Nonbank loans are loans classified as Term Loan B-Term Loan K, while bank loans are loans that are classified as Term A or Term Loan in Dealscan. Real investment loans are loans whose primary purpose is a "corporate purpose", a "working capital" purpose or "capital expenditure" purpose according to Dealscan.

Panel A - New Loan Originations



Panel B - New Loan Originations - De-trended

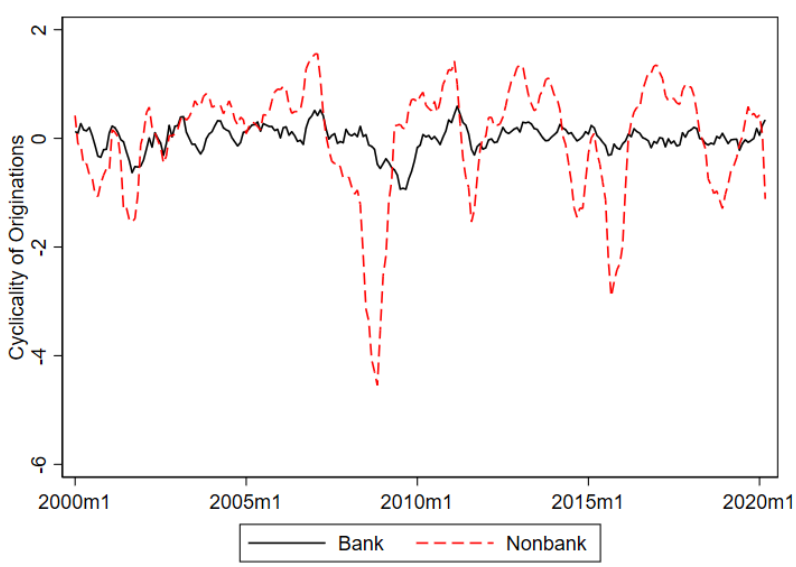
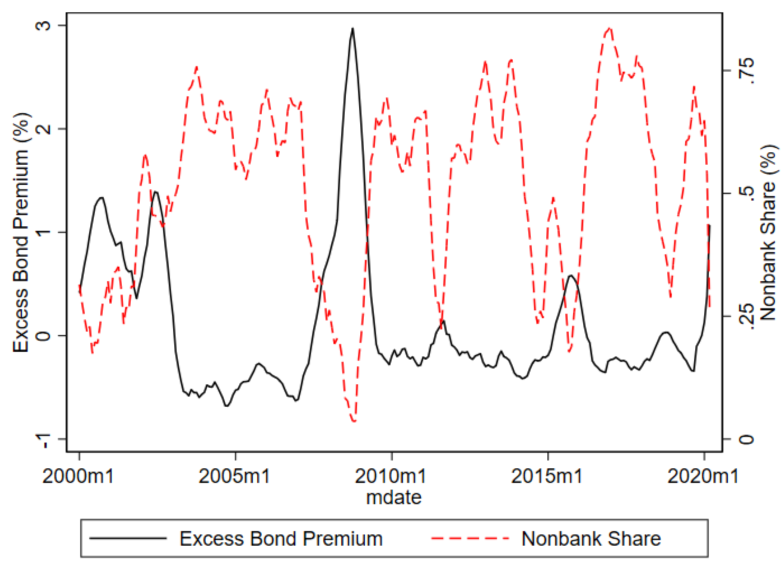


Figure 2: Variation in Nonbank Lending Share and Loan Pricing over Time

This figure shows how nonbank lending varies with credit conditions. Panel A shows the nonbank share of newly originated term loans vs. the Excess Bond Premium from Gilchrist and Zakrajšek (2012) as a measure of the credit cycle. Panel B shows the difference in the all-in-drawn spread between bank and nonbank term loans, after controlling for loan characteristics. All series are smoothed using a six-month forward-looking and include only real investment term loans to focus on the segment of the market where banks and nonbanks coexist. Nonbank loans are loans classified as Term Loan B-Term Loan K, while bank loans are loans that are classified as Term A or Term Loan in Dealscan. Real investment loans are loans whose primary purpose is a "corporate purpose", a "working capital" purpose or "capital expenditure" purpose according to Dealscan.

Panel A - Correlation between Excess Bond Premium and Nonbank Lending Share



Panel B - Correlation between Excess Bond Premium and Nonbank Loan Pricing

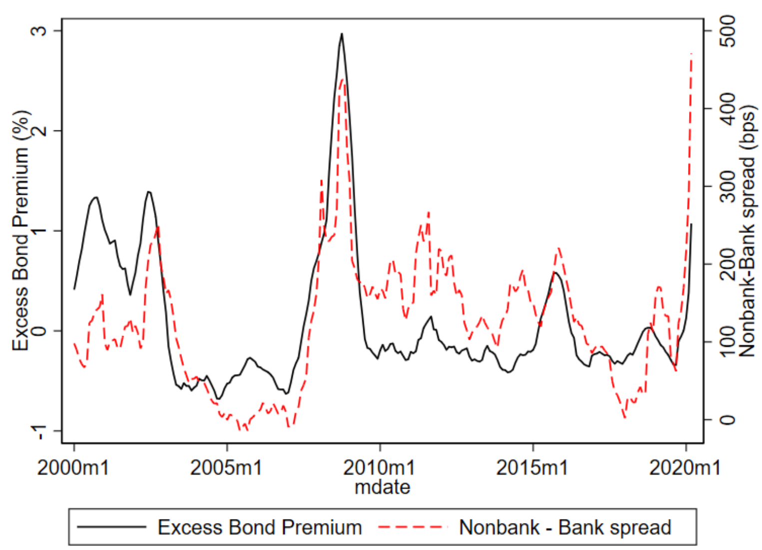
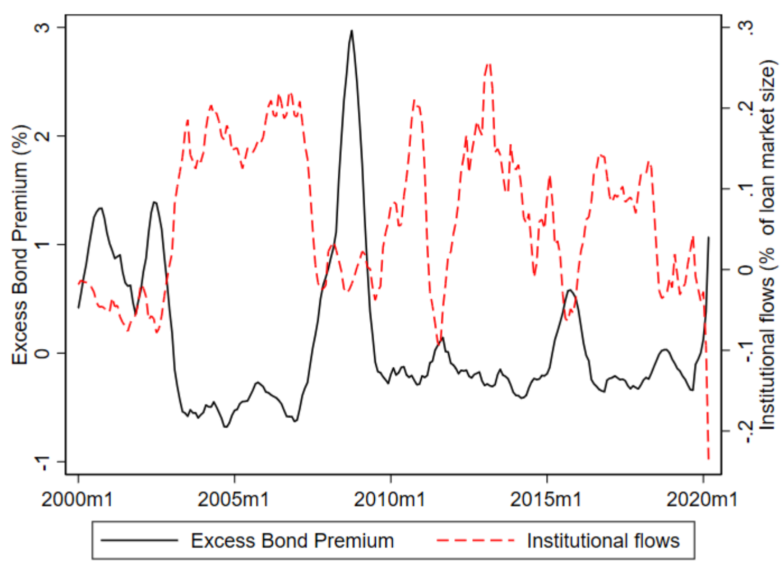


Figure 3: Fund Flows and the Credit Cycle

This figure shows how fund flows vary with credit conditions and the nonbank lending share. Panel A shows the correlation between the fund flows and the Excess Bond Premium from Gilchrist and Zakrajšek (2012) as a measure of the credit cycle. Panel B shows the correlation between the share of nonbank loans originated in the month and fund flows. All series are smoothed using a six-month forward-looking average. Fund flows are the sum of changes in CLO AUM and net flows to mutual funds in a given month as a share of the average monthly term loan issuance volume of syndicated loans in the previous 12 months. Nonbank lending share is the share of nonbank loans as a fraction of all term loans. Nonbank loans are loans classified as Term Loan B-Term Loan K, while bank loans are loans that are classified as Term A or Term Loan in Dealscan.

Panel A - Correlation between Fund Flows and Excess Bond Premium



Panel B - Correlation between Fund Flows and Nonbank Lending Share

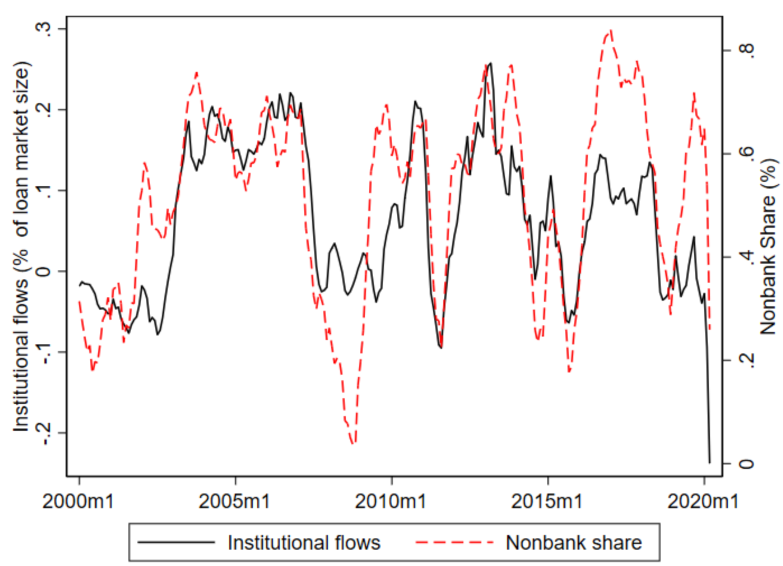
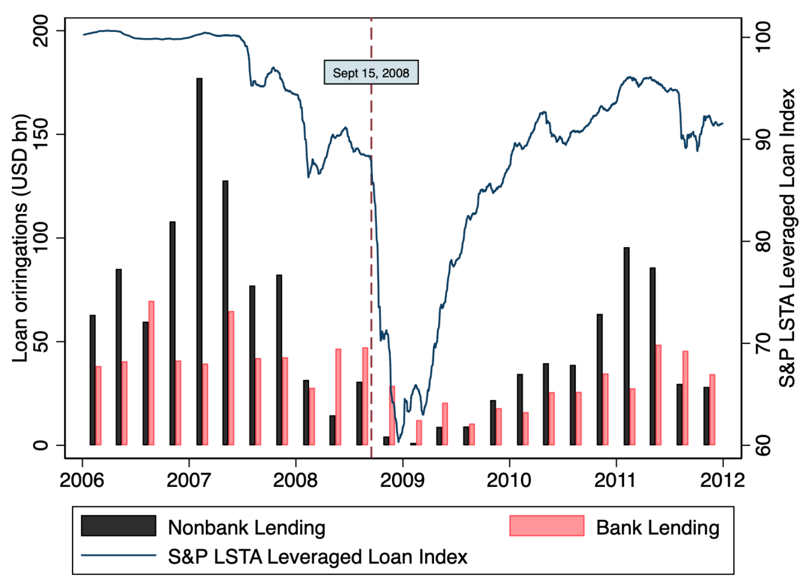


Figure 4: Lending during the Great Recession and COVID-19

Panel A plots the quarterly aggregate issuance of nonbank term loans (Term B tranches) and bank term loans (Term A tranches), and the daily S&P LSTA Leveraged Loan Index from 2006 to 2011. The vertical line indicates the default of Lehman Brothers on September 15, 2008.
Panel B plots the weekly aggregate issuance of nonbank term loans and bank term loans, and the daily S&P LSTA Leveraged Loan Index from January 2020 to April 2020. The dashed vertical lines indicate the following four events: (1) the first COVID-19 related death in the U.S. (February 29), (2) declarence of a national emergency in the U.S. (March 13), (3) the Fed announced its Primary Dealer Credit Facility and its Commercial Paper Funding Facility (March 17), (4) the Fed announced its Primary Market Corporate Credit Facility, Secondary Market Corporate Credit Facility and Term Asset-Backed Securities Loan Facility (March 23).

Panel A - Lending during the Great Recession



Panel B - Lending during COVID-19

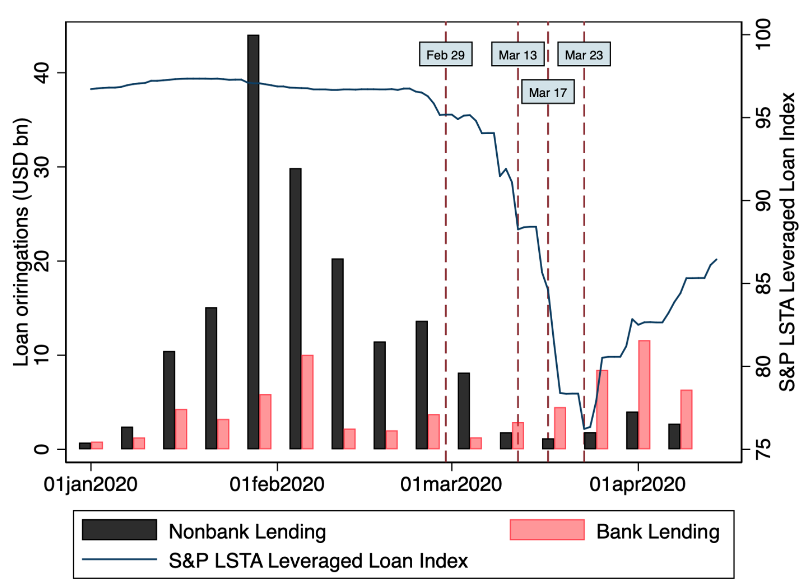
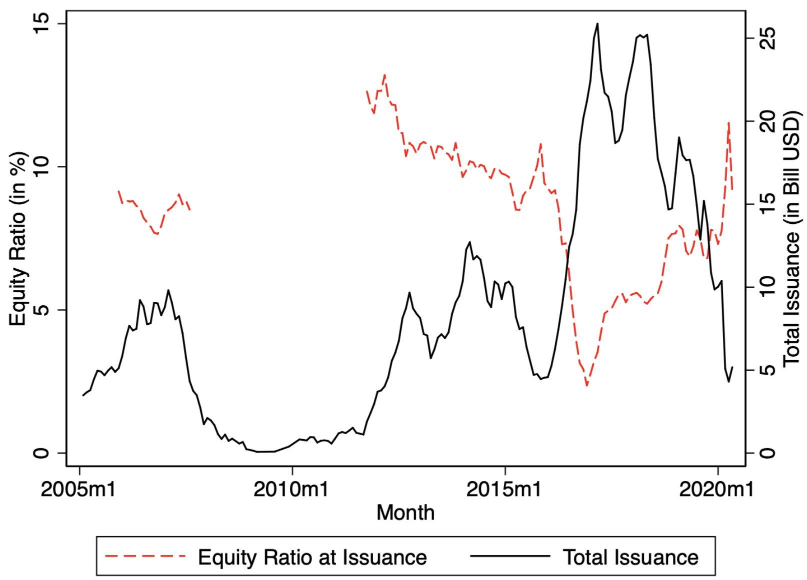


Figure 5: CLO Equity Ratio

This figure plots the aggregate CLO issuance volume (in billion USD) and aggregate equity ratio (in %) at issuance from January 2005 to April 2020. Both series are smoothed using a six-month forward-looking moving average. CLO issuance includes both new issues as well as reset/repricings. We define the issuance date of a tranche as the pricing date for new issues (effective date if pricing date is missing) and the first reportdate for reset/repriced tranches. The equity ratio at issuance is the CLO-volume-weighted equity ratio. As equity tranches are typically not reset/repriced, we use the current equity ratio at issuance date for CLOs that reset/reprice debt tranches. For the average equity ratio we require at least 7 observations for a months to be included in the series.



Tables

Table 1: Summary Statistics

This table presents the summary statistics for our main variables of interest at the aggregate level (Panel A), loan facility level (Panel B), and bank-month level (Panel C). *Term B Volume* is the sum of term loan facilities that are classified as Term Loan B-Term Loan K. *Term A Volume* is the sum of term loan facilities that are classified as Term A or Term Loan. *Non-bank Share* is the share of Term Loan B as a fraction of total term loans. *Total Funds Flows* is the sum of changes in CLO AuM and net mutual fund flows in the month as a share of the average syndicated loan market in the previous 12 months. *Excess Bond Premium* is the measure of aggregate credit risk premium as measured by Gilchrist and Zakrajšek (2012). *CLO Issuance* is the volume of new CLOs issued in the month. *CLO Equity Ratio* is the share of the equity tranche in newly issued CLOs. *Deal Amount* is the sum of term loan facilities in the deal. *Term B in Deal* is an indicator that takes value of 1 if a deal contains a Term B-Term K facility and zero otherwise. *Term A in Deal* is an indicator that takes value of 1 if a deal contains a Term A facility and zero otherwise. *Spread* is the all-in-drawn-spread of the facility. *Maturity* is the facility-level loan maturity. *Relationship with Syndicate* is the average share of loans in the prior three years that has been provided by a syndicate member. *Non-Lead Commitments* are the loan commitments from non-lead syndicate members in the deal at origination. The sample period goes from 2000 to 2020Q1.

Panel A - Aggregate Level

	Mean	Median	Std. dev.
Term B Volume (in Bill. USD)	23.12	17.04	20.48
Term A Volume (in Bill. USD)	13.63	12.36	8.57
Non-Bank Share (in %)	56.32	59.59	17.34
Total Fund Flows (in %)	6.58	6.13	11.99
Excess Bond Premium (in basis points)	9.52	-17.20	74.42
CLO Issuance (in Bill. USD)	6.90	4.78	7.25
CLO Equity Ratio (in %)	8.12	8.62	2.81
Observations	243		

Panel B - Facility Level

	Mean	Median	Std. dev.
Term B Volume (in Mill. USD)	482.63	250.00	812.51
Term A Volume (in Mill. USD)	180.20	65.00	623.25
Deal Amount (in Mill. USD)	338.13	110.00	794.24
Term B in Deal	0.44	0.00	0.50
Term A in Deal	0.70	1.00	0.46
Term B Spread (in basis points)	370.38	350.00	169.59
Term A Spread (in basis points)	301.69	275.00	229.36
Maturity TLB (in months)	68.49	72.00	16.74
Maturity TLA (in months)	56.05	60.00	23.90
Relationship with TLB Syndicate (in %)	13.52	8.54	18.15
Relationship with TLA Syndicate (in %)	11.14	0.00	19.41
Observations	52832		

Panel C - Bank-Month Level

	Mean	Median	Std. dev.
Term B Volume (in Mill. USD)	751.14	267.30	1251.55
Term A Volume (in Mill. USD)	361.46	206.10	474.23
Term B Non-Lead Commitments (in Mill. USD)	174.07	75.22	298.09
Term A Non-Lead Commitments (in Mill. USD)	171.65	103.49	225.95
Observations	15982		

Table 2: Loan Characteristics

This table reports loan-volume weighted distributions of loans across loan types (Panel A), loan purposes (Panel B) and loan risk (Panel C) for different samples. We report numbers for the entire Dealscan universe and numbers for a sample that merges Dealscan with CLO holdings data from Creditflux. Distributions for the Creditflux-DealScan samples are weighted by CLO holdings per loan. CLO holdings per loan are defined as the time-series average of aggregate quarterly holdings for that loan across all CLOs in Creditflux. The table also reports the number of loans in each sample (N) and the total loan volume. Term B loans are loans classified as Term Loan B-Term Loan K, while Term A loans are loans that are classified as Term A or Term Loan in Dealscan. Loans with minimum all-in-drawn-spread of 225 basispoints are defined as leveraged loans and loans with less than 225 basispoints all-in-drawn-spread are defined as investment grade. The sample period goes from 2000 to 2020Q1.

Panel A - Loan Type

	Dealscan Sample	All Term Loans Dealscan Sample	Creditflux-Dealscan Sample	All Term Loans Creditflux-Dealscan Sample
Credit Line	45.74%		0.57%	
Term Loan A	11.81%	34.44%	5.20%	5.24%
Term Loan B	22.48%	65.56%	94.03%	94.76%
Other	19.96%		0.21%	
Volume (in Tn USD)	27.95	9.59	3.16	2.99
N	90,712	37,574	6,413	5,939

Panel B - Loan Purpose - Term Loans

	All Term Loans Dealscan Sample	Term B Loans Dealscan Sample	Term A Loans Dealscan Sample	All Term Loans Creditflux-Dealscan Sample
Corporate Purposes	46.28%	47.75%	43.49%	50.31%
Takeover	15.24%	13.39%	18.77%	11.73%
Working Capital	2.46%	1.92%	3.48%	0.72%
CP Backup	0.03%	0.00%	0.09%	0.00%
Debt Repayment	4.77%	5.47%	3.44%	5.92%
LBO	9.77%	12.20%	5.13%	10.30%
Acquisition Line	6.20%	5.08%	8.35%	5.32%
Project Finance	2.17%	0.70%	5.00%	0.34%
Recapitalization	0.31%	0.23%	0.45%	0.23%
Real Estate	0.85%	0.09%	2.28%	0.02%
Other	11.91%	13.16%	9.54%	15.10%
Volume (in Tn USD)	9.59	6.28	3.30	2.99
N	37,574	16,915	20,659	5,939

Panel C - Investment Grade vs. Leveraged Loan - Term Loans

	All Term Loans Dealscan Sample	Term B Loans Dealscan Sample	Term A Loans Dealscan Sample	All Term Loans Creditflux-Dealscan Sample
Investment Grade	27.57%	16.17%	50.10%	8.51%
Leveraged	67.43%	81.19%	41.24%	91.29%
Volume (in Tn USD)	9.59	6.28	3.30	2.99
N	37,574	16,915	20,659	5,939

Table 3: Nonbank Lending Cyclicality - Aggregate Results

This table reports results on aggregate monthly loan originations. The unit of observation is a loan type x month pair. We report the results of

$$\text{Lending Outcome}_{ft} = \beta_0 + \beta_1 \text{Credit Cycle}_{t-1} + \beta_2 \mathbb{I}_{f=\text{TermB}} + \beta_3 \text{Credit Cycle}_{t-1} \times \mathbb{I}_{f=\text{TermB}} + \epsilon_{ft}$$

where Lending $\text{Outcome}_{f,t}$ is either the log of the total origination amount (Panel A) or the weighted average spread (Panel B) for all loans of tranche type f originated in month t. $\mathbb{I}_{f=\text{Term B}}$ is a dummy variable that is 1 if the facility type is a Term B type. Credit Cycle is the Excess Bond Premium from Gilchrist and Zakrajšek (2012). Our sample includes all term loans originated between 2000 and 2020Q1. There are no Term B loans originated in February 2009. The Excess Bond Premium is standardized to have mean 0 and standard deviation of 1. Robust standard errors are presented. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - Loan Volumes

	Log(Facility Amount)		
	(1)	(2)	(3)
Excess Bond Premium	−0.509***	−0.228***	
	(0.048)	(0.037)	
Term B	0.267***	0.262***	0.261***
	(0.069)	(0.064)	(0.038)
Excess Bond Premium x Term B		−0.576***	−0.580***
		(0.069)	(0.061)
Year-Month FE	N	N	Y
Obs.	485	485	484
R^2	0.324	0.420	0.898

Panel B - Loan Spreads

	All-in-drawn Spread		
	(1)	(2)	(3)
Excess Bond Premium	38.765***	13.822	
	(10.675)	(9.730)	
Term B	90.999***	91.374***	91.619***
	(8.788)	(8.570)	(6.846)
Excess Bond Premium x Term B		51.188**	52.037***
		(20.430)	(18.043)
Year-Month FE	N	N	Y
Obs.	485	485	484
R^2	0.277	0.327	0.790

Table 4: Nonbank Lending Cyclicality - Within-Deal Results

This table reports results at the individual loan facility level. We estimate

$$\text{Lending Outcome}_{idft} = \delta_{idt} + \beta \text{Credit Cycle}_{t-1} \times \mathbb{I}_{f=\text{TermB}} + \epsilon_{idft}$$

where Lending Outcome_{idft} is either a loan indicator (Panel A), the logarithm of the loan issuance volume (Panel B) or the all-in-drawn spread (Panel C) at origination to borrower i for deal d, tranche-type f which is either a Term A loan or Term B loan, in month t. $\mathbb{I}_{f=\text{Term B}}$ is a dummy variable that takes value of 1 if the loan is a Term B loan and 0 otherwise. Credit Cycle is the Excess Bond Premium from Gilchrist and Zakrajšek (2012). In column (5) of Panel B and C we control for the logarithm of loan maturity interacted with the Term B dummy (double interaction) and the standardised facility-level average relationship of the borrower with all syndicate members interacted with the Term B dummy and the Excess Bond Premium (triple interaction). The relationship for each borrower-bank pair is defined as the share of borrower i's loan volume in the prior five years that has been provided by the respective bank. Columns (1)-(3) of Panel A are on the borrower x loan type x month level. The dependent variable is 1 if borrower i received at least one loan of type f in month t. Our sample includes all term loans originated between 2000 and 2020Q1. The Excess Bond Premium is standardized to have mean 0 and standard deviation of 1. Standard errors are double clustered at the firm and month. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - Extensive Margin

	Fully Balanced Panel			Conditional on Deal
	(1)	(2)	(3)	(4)
	Prob(Loan)	Prob(Loan)	Prob(Loan)	Prob(Loan)
Excess Bond Premium	−0.108***	−0.084***		
	(0.007)	(0.007)		
Term B	−0.214***	−0.214***	−0.214***	−29.551***
	(0.014)	(0.013)	(0.013)	(1.512)
Excess Bond Premium x Term B		−0.046***	−0.046***	−18.654***
		(0.011)	(0.011)	(1.498)
Borrower FE	Y	Y	N	N
Year-Month FE	N	N	N	N
Deal FE	N	N	Y	Y
Obs.	6,207,678	6,207,678	6,207,678	52,760
R^2	0.005	0.005	0.623	0.207

Nonbank Lending Cyclicality - Within-Deal Results - Continued

Panel B - Loan Volumes

	Log(Facility Amount)				
	(1)	(2)	(3)	(4)	(5)
Excess Bond Premium	−0.113***	−0.068***			
	(0.019)	(0.015)			
Term B	0.534***	0.495***	0.476***	0.419***	0.446***
	(0.022)	(0.021)	(0.020)	(0.024)	(0.028)
Excess Bond Premium x Term B		−0.140***	−0.144***	−0.167***	−0.157***
		(0.022)	(0.019)	(0.028)	(0.033)
Borrower FE	Y	Y	Y	N	N
Year-Month FE	N	N	Y	N	N
Deal FE	N	N	N	Y	Y
Maturity Controls	N	N	N	N	Y
Relationship Controls	N	N	N	N	Y
Obs.	23,547	23,547	23,547	7,194	6,112
R^2	0.797	0.798	0.835	0.898	0.900

Panel C - Loan Spreads

	All-in-drawn Spread				
	(1)	(2)	(3)	(4)	(5)
Excess Bond Premium	20.770***	−0.729			
	(3.274)	(4.025)			
Term B	−52.926***	−35.784***	−30.521***	−84.970***	−97.821***
	(6.272)	(5.189)	(5.190)	(7.979)	(7.484)
Excess Bond Premium x Term B		60.743***	62.356***	77.073***	79.836***
		(5.154)	(4.741)	(8.124)	(8.793)
Borrower FE	Y	Y	Y	N	N
Year-Month FE	N	N	Y	N	N
Deal FE	N	N	N	Y	Y
Maturity Controls	N	N	N	N	Y
Relationship Controls	N	N	N	N	Y
Obs.	21,177	21,177	21,177	6,562	5,694
R^2	0.585	0.595	0.633	0.713	0.786

Table 5: Instrumented Fund Flows - Aggregate Results

This table reports results on aggregate monthly loan originations. The unit of observation is a loan type x month pair. We report the results of the following 2-stage regression

$$\text{Fund Flows}_t = \alpha + \gamma \text{Credit Cycle}_t + \epsilon_t$$
$$\text{Lending Outcome}_{ft} = \beta_0 + \beta_1 \widehat{\text{Fund Flows}}_{t-1} \times \mathbb{I}_{f=\text{TermB}} + \epsilon_{ft}$$

where Lending $\text{Outcome}_{f,t}$ is either the log of the total origination amount (Panel A) or the weighted average spread (Panel B) for all loans of tranche type f originated in month t. $\mathbb{I}_{f=\text{Term B}}$ is a dummy variable that is 1 if the facility type is a Term B type. Credit Cycle is the Excess Bond Premium from Gilchrist and Zakrajšek (2012) and is used to instrument for Fund Flows in month t. Fund Flows are the sum of changes in CLO AUM and net flows to mutual funds in a given month as a share of the average monthly term loan issuance volume of syndicated loans in the previous 12 months. Our sample includes all term loans originated between 2000 and 2020Q1. There are no Term B loans originated in February 2009. The Excess Bond Premium and Fund Flows are standardized to have mean 0 and standard deviation of 1. Robust standard errors are presented. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - First Stage

	Fund Flows
	(1)
Excess Bond Premium	−0.488***
	(0.060)
Obs.	243
R^2	0.238

Panel B - Loan Volumes and Spreads

	Log(Facility Amount)			All-in-drawn Spread		
	(1)	(2)	(3)	(4)	(5)	(6)
Fund Flows	1.032***	0.468***		−78.552***	−28.331	
	(0.126)	(0.084)		(25.051)	(21.628)	
Term B	0.270***	0.268***	0.265***	90.744***	90.940***	91.271***
	(0.098)	(0.103)	(0.068)	(10.764)	(11.217)	(8.602)
Fund Flows x Term B		1.143***	1.161***		−101.834**	−104.192**
		(0.238)	(0.194)		(50.105)	(40.341)
Year-Month FE	N	N	Y	N	N	Y
Obs.	485	485	484	485	485	484
F-Stat	129.813	64.791	62.520	129.813	64.791	62.520

Table 6: Fund Flows Instrumented - Within-Deal Results

This table reports results at the individual loan facility level. We estimate the 2-stage regression

$$\text{Fund Flows}_t = \alpha + \gamma \text{Credit Cycle}_t + \epsilon_t$$
$$\text{Lending Outcome}_{ifdt} = \delta_{dt} + \beta \widehat{\text{Fund Flows}}_t \times \mathbb{I}_{f=\text{TermB}} + \epsilon_{fdt}$$

where Lending Outcome$_{idft}$ is either a loan indicator (Column 1), the log of total loan amount (Column 2-3), or the all-in-drawn spread (Column 4-5) of tranche f in month t to borrower i in deal d. $\mathbb{I}_{f=\text{Term B}}$ is a dummy variable that takes value of 1 if the loan is a Term B tranche and 0 otherwise. Credit Cycle is the Excess Bond Premium and is used to instrument for Fund Flows in month t. Fund Flows are the sum of changes in CLO AUM and net flows to mutual funds in a given month as a share of the average monthly term loan issuance volume of syndicated loans in the previous 12 months. In column (3) and (5) we control for the logarithm of the facility maturity interacted with the Term B dummy (double interaction) and the standardised facility-level average relationship of the borrower with all syndicate members interacted with the Term B dummy and the Excess Bond Premium (triple interaction). The relationship for each borrower-bank pair is defined as the share of borrower i's loan volume in the prior five years that has been provided by the respective bank. Our sample includes all term loans originated between 2000 and 2020Q1. The Excess Bond Premium and Fund Flows are standardized to have mean 0 and standard deviation of 1. Standard errors are double clustered at the firm and month. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

	Prob(Loan)	Log(Facility Amount)		All in Drawn Spread	
	(1)	(2)	(3)	(4)	(5)
Term B	−31.185***	0.399***	0.425***	−75.945***	−87.232***
	(1.860)	(0.027)	(0.031)	(8.877)	(9.420)
Fund Flows x Term B	28.538***	0.212***	0.194***	−96.722***	−98.464***
	(2.751)	(0.037)	(0.043)	(12.260)	(13.962)
Deal FE	Y	Y	Y	Y	Y
Maturity Controls	N	N	Y	N	Y
Relationship Controls	N	N	Y	N	Y
Obs.	52,760	7,194	6,112	6,562	5,694
F-Stat	121.157	223.349	212.822	236.075	210.200

Table 7: Within-Bank Results

This table presents results on bank vs. nonbank loan originations at the bank level. A unit of observation is a bank x loan type x month observation. We report results from the regression

$$\text{Lending Outcome}_{bft} = \beta_0 + \beta_1 \text{Credit Cycle}_{t-1} + \beta_2 \mathbb{I}_{f=\text{TermB}} + \beta_3 \text{Credit Cycle}_{t-1} \times \mathbb{I}_{f=\text{TermB}} + \epsilon_{bft}$$

where Lending $\text{Outcome}_{b,f,t}$ is either the log of total loan amount (Panel A) or the weighted average spread (Panel B) of all loans of tranche type f originated by bank b in month t. We distribute loan amount equally across all syndicate members within a loan tranche. $\mathbb{I}_{f=\text{Term B}}$ is a dummy variable that takes value of 1 if the loan type is a Term B type. Credit Cycle is the Excess Bond Premium from Gilchrist and Zakrajšek (2012). Our sample includes all term loans originated between 2000 and 2020Q1. Column (1)-(3) & (5) includes all loans bank b participantes in. Column (4) considers only loans where bank b was not a lead arranger. The Excess Bond Premium is standardized to have mean 0 and standard deviation of 1. Standard errors are clustered at the bank level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - Loan Volumes

	Log(Amount)				
	(1)	(2)	(3)	(4)	(5)
Excess Bond Premium	−0.246***	−0.256***			
	(0.024)	(0.023)			
Term B	0.289**	0.153	0.154	−0.040	−3.082***
	(0.112)	(0.107)	(0.116)	(0.076)	(0.545)
Excess Bond Premium x Term B	−0.300***	−0.330***	−0.349***	−0.274***	−0.266***
	(0.024)	(0.023)	(0.023)	(0.021)	(0.035)
Bank FE	N	Y	N	N	N
Bank x Month FE	N	N	Y	Y	Y
Role	All	All	All	Non-Lead	All
Maturity Controls	N	N	N	N	Y
Relationship Controls	N	N	N	N	Y
Obs.	15,982	15,982	13,748	10,204	13,622
R^2	0.081	0.334	0.771	0.674	0.775

Panel B - Loan Spreads

	All-in-drawn Spread				
	(1)	(2)	(3)	(4)	(5)
Excess Bond Premium	10.453***	10.825***			
	(2.570)	(2.467)			
Term B	81.884***	77.173***	78.008***	82.321***	356.397***
	(5.845)	(6.351)	(6.557)	(5.277)	(68.418)
Excess Bond Premium x Term B	21.530***	20.621***	27.375***	17.335***	18.894***
	(3.068)	(2.886)	(3.820)	(1.861)	(3.026)
Bank FE	N	Y	N	N	N
Bank x Month FE	N	N	Y	Y	Y
Role	All	All	All	Non-Lead	All
Maturity Controls	N	N	N	N	Y
Relationship Controls	N	N	N	N	Y
Obs.	15,982	15,982	13,748	10,204	13,622
R^2	0.108	0.202	0.672	0.673	0.680

Table 8: Determinants of Lending in the GFC: Nonbank Dependence vs. Bank Health

This table runs a horse-race between nonbank dependence and measures of bank health for explaining changes in originations during the Great Recession. We estimate the cross-sectional regression

$$\text{Lending Change}_b = \beta_0 + \beta_1 \text{Nonbank Dependence}_b + \epsilon_b.$$

Lending changes and measures of bank health are obtained from Chodorow-Reich (2013). The dependent variable measures the change in the annualized number of real investment loans between the periods October 2005 to June 2007 and October 2008 to June 2009 made by bank b. Each loan is scaled by the importance of the lender in the loan syndicate as described in Chodorow-Reich (2013). We define Nonbank Dependence as the share of nonbank (Term Loan B) loans relative to all loans originated by the bank between October 2005-June 2006 and October 2006-June 2007 in order to be consistent with the methodology in Chodorow-Reich (2013). The observations are weighted by the number of precrisis borrowers to capture the economic importance of each bank. All explanatory variables are normalized to have mean zero and standard deviation of one. Robust standard errors in parentheses. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

	Change in lending during crisis			
	(1)	(2)	(3)	(4)
Nonbank Dependence	-0.162^{***}	-0.144^{***}	-0.147^{***}	-0.141^{*}
	(0.027)	(0.035)	(0.025)	(0.062)
Lehman exposure		-0.025		
		(0.035)		
ABX Exposure			-0.071	
			(0.050)	
07-08 Trading Rev/AT				0.039
				(0.026)
07-08 RE NCO/AT				-0.079
				(0.043)
07 Deposits/Assets				0.137
				(0.070)
IB/FinCo indicator				0.141
				(0.140)
Constant	-0.567^{***}	-0.567^{***}	-0.584^{***}	-0.582^{***}
	(0.034)	(0.035)	(0.032)	(0.055)
Obs.	43	42	40	42
R^2	0.337	0.326	0.412	0.429

Table 9: Flow-Performance Relationship for Open-End Loan Mutual Funds

This table reports results on the flow-performance relationship on the individual fund level. A unit of observation is a fund x month pair. We estimate

$$\text{Flows}_{ft} = \beta_0 + \beta_1 \alpha_{ft-1} + \beta_2 \alpha_{ft-1} \mathbb{I}_{\alpha_{ft-1}<0} + \text{Fund Controls}_{ft-1} + \gamma_t + \varepsilon_{ft}$$

where Flows_{ft} are the flows of fund f in month t relative to the fund's AuM in the previous month. The explanatory variable α_{ft-1} measures either the fund's return over the past month or the relative performance (alpha). We obtain the fund alpha by regressing the fund returns over the last 12 months on returns of the most widely-used benchmark in the loan market: the S&P/LSTA Leveraged Loan Index. We interact alpha with the dummy variable $\mathbb{I}_{\alpha_{ft-1}<0}$ which is equal to one if the fund's alpha is negative and zero otherwise. We include lagged flows, AuM and age (in years) as controls. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

	Fund Flows			
	(1)	(2)	(3)	(4)
Lagged Return	0.256***	0.424***		
	(0.087)	(0.145)		
Alpha			2.155***	0.284
			(0.767)	(1.102)
Alpha * (Alpha < 0)				1.820**
				(0.765)
Lagged Flows	0.510***	0.401***	0.316***	0.294***
	(0.048)	(0.049)	(0.047)	(0.047)
Log(Fund Age)	−0.628***	−0.820***	−0.560***	−0.492**
	(0.146)	(0.199)	(0.209)	(0.201)
Log(Lagged Fund Size)	−0.022	0.003	0.131	0.141
	(0.070)	(0.089)	(0.093)	(0.091)
(Alpha < 0)				−0.501***
				(0.170)
Year-Month FE	N	Y	Y	Y
Obs.	6,090	6,090	5,433	5,433
R^2	0.306	0.448	0.405	0.414

A1 Appendix - Additional Results

Table A1: Robustness: Alternate Credit Cycle Measures - Within-Deal Results

This table reports results at the individual loan facility level. We estimate

$$\text{Lending Outcome}_{idft} = \delta_{idt} + \beta \text{Credit Cycle}_{t-1} \times \mathbb{I}_{f=\text{TermB}} + \epsilon_{idft}$$

where Lending Outcome_{idft} is either the logarithm of the loan issuance volume (column 1-3) or the all-in-drawn spread (column 4-6) at origination to borrower i for deal d, tranche-type f which is either a Term A loan or Term B loan, in month t. $\mathbb{I}_{f=\text{Term B}}$ is a dummy variable that takes value of 1 if the loan is a Term B loan and 0 otherwise. Credit Cycle is the VIX (Panel A), the High Yield Spread (Panel B), and the Gilchrist and Zakrajšek (2012) Spread (Panel C). In column (3) and (6) we control for the logarithm of loan maturity interacted with the Term B dummy (double interaction) and the standardised facility-level average relationship of the borrower with all syndicate members interacted with the Term B dummy and the Excess Bond Premium (triple interaction). The relationship for each borrower-bank pair is defined as the share of borrower i's loan volume in the prior five years that has been provided by the respective bank. Our sample includes all term loans originated between 2000 and 2020Q1. The Credit Cycle variables are standardized to have mean 0 and standard deviation of 1. Standard errors are double clustered at the firm and month. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - VIX

	Log(Facility Amount)			All-in-drawn Spread		
	(1)	(2)	(3)	(4)	(5)	(6)
VIX	−0.161***			23.742***		
	(0.019)			(2.892)		
Term B	0.525***	0.476***	0.444***	−31.799***	−10.510**	−82.201***
	(0.022)	(0.020)	(0.029)	(5.680)	(5.075)	(8.020)
VIX x TermB		−0.137***	−0.165***		62.554***	73.073***
		(0.022)	(0.038)		(5.001)	(8.804)
Borrower FE	Y	Y	N	Y	Y	N
Year-Month FE	N	Y	N	N	Y	N
Deal FE	N	N	Y	N	N	Y
Maturity Controls	N	N	Y	N	N	Y
Relationship Controls	N	N	Y	N	N	Y
Obs.	23,597	23,597	6,130	23,597	23,597	6,130
R^2	0.799	0.834	0.901	0.554	0.587	0.768

Robustness: Alternate Credit Cycle Measures - Within-Deal Results - Continued

Panel B - High Yield spread

	Log(Facility Amount)			All-in-drawn Spread		
	(1)	(2)	(3)	(4)	(5)	(6)
High Yield Spread	−0.172***			34.949***		
	(0.019)			(3.193)		
Term B	0.522***	0.467***	0.425***	−29.625***	−5.362	−74.557***
	(0.021)	(0.021)	(0.029)	(5.590)	(4.932)	(8.086)
High Yield Spread x TermB		−0.153***	−0.188***		72.853***	82.306***
		(0.022)	(0.038)		(5.909)	(8.729)
Borrower FE	Y	Y	N	Y	Y	N
Year-Month FE	N	Y	N	N	Y	N
Deal FE	N	N	Y	N	N	Y
Maturity Controls	N	N	Y	N	N	Y
Relationship Controls	N	N	Y	N	N	Y
Obs.	23,597	23,597	6,130	23,597	23,597	6,130
R^2	0.799	0.834	0.901	0.559	0.589	0.769

Panel C - Gilchrist-Zakrajsek Spread

	Log(Facility Amount)			All-in-drawn Spread		
	(1)	(2)	(3)	(4)	(5)	(6)
GZ Spread	−0.205***			26.719***		
	(0.023)			(3.197)		
Term B	0.519***	0.464***	0.421***	−31.379***	−8.384*	−75.787***
	(0.021)	(0.019)	(0.028)	(5.616)	(4.734)	(7.284)
GZ Spread x TermB		−0.190***	−0.252***		74.500***	99.816***
		(0.024)	(0.043)		(5.977)	(8.706)
Borrower FE	Y	Y	N	Y	Y	N
Year-Month FE	N	Y	N	N	Y	N
Deal FE	N	N	Y	N	N	Y
Maturity Controls	N	N	Y	N	N	Y
Relationship Controls	N	N	Y	N	N	Y
Obs.	23,597	23,597	6,130	23,597	23,597	6,130
R^2	0.801	0.835	0.901	0.555	0.588	0.772

Table A2: Robustness: Real Investment Loans - Within-Deal Results

This table reports results at the individual loan facility level. We estimate

$$\text{Lending Outcome}_{idft} = \delta_{idt} + \beta \text{Credit Cycle}_{t-1} \times \mathbb{I}_{f=\text{TermB}} + \epsilon_{idft}$$

where Lending Outcome$_{idft}$ is either the logarithm of the loan issuance volume (Panel A) or the all-in-drawn spread (Panel B) at origination to borrower i for deal d, tranche-type f which is either a Term A loan or Term B loan, in month t. $\mathbb{I}_{f=\text{Term B}}$ is a dummy variable that takes value of 1 if the loan is a Term B loan and 0 otherwise. Credit Cycle is the Excess Bond Premium from Gilchrist and Zakrajšek (2012). In column (5) we control for the logarithm of loan maturity interacted with the Term B dummy (double interaction) and the standardised facility-level average relationship of the borrower with all syndicate members interacted with the Term B dummy and the Excess Bond Premium (triple interaction). The relationship for each borrower-bank pair is defined as the share of borrower i's loan volume in the prior five years that has been provided by the respective bank. Our sample includes all *real investment* term loans originated between 2000 and 2020Q1. Real investment loans are loans whose primary purpose is a "corporate purpose", a "working capital" purpose or "capital expenditure" purpose according to Dealscan. The Excess Bond Premium is standardized to have mean 0 and standard deviation of 1. Standard errors are double clustered at the firm and month. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - Loan Volumes

	Log(Facility Amount)				
	(1)	(2)	(3)	(4)	(5)
Excess Bond Premium	−0.083***	−0.047***			
	(0.019)	(0.017)			
Term B	0.439***	0.386***	0.360***	0.249***	0.268***
	(0.030)	(0.033)	(0.030)	(0.037)	(0.047)
Excess Bond Premium x Term B		−0.145***	−0.170***	−0.197***	−0.216***
		(0.034)	(0.032)	(0.044)	(0.056)
Borrower FE	Y	Y	Y	N	N
Year-Month FE	N	N	Y	N	N
Deal FE	N	N	N	Y	Y
Maturity Controls	N	N	N	N	Y
Relationship Controls	N	N	N	N	Y
Obs.	11,220	11,220	11,220	2,310	2,002
R^2	0.835	0.836	0.865	0.895	0.898

Panel B - Loan Spreads

	All-in-drawn Spread				
	(1)	(2)	(3)	(4)	(5)
Excess Bond Premium	27.511***	13.806***			
	(3.747)	(4.058)			
Term B	−5.932	11.909*	16.268**	−31.242***	−45.896***
	(6.606)	(6.384)	(6.409)	(8.772)	(9.671)
Excess Bond Premium x Term B		48.675***	47.575***	60.922***	62.949***
		(7.049)	(6.874)	(10.189)	(10.628)
Borrower FE	Y	Y	Y	N	N
Year-Month FE	N	N	Y	N	N
Deal FE	N	N	N	Y	Y
Maturity Controls	N	N	N	N	Y
Relationship Controls	N	N	N	N	Y
Obs.	9,711	9,711	9,711	1,968	1,758
R^2	0.664	0.669	0.710	0.745	0.781

Table A3: Robustness: Including Credit Lines - Within-Deal Results

This table reports results at the individual loan facility level. We estimate

$$\text{Lending Outcome}_{idft} = \delta_{idt} + \beta \text{Credit Cycle}_{t-1} \times \mathbb{I}_{f=\text{TermB}} + \epsilon_{idft}$$

where Lending Outcome_{idft} is either the logarithm of the loan issuance volume (Panel A) or the all-in-drawn spread (Panel B) at origination to borrower i for deal d, tranche-type f which is either a Term A loan or Term B loan, in month t. $\mathbb{I}_{f=\text{Term B}}$ is a dummy variable that takes value of 1 if the loan is a Term B loan and 0 otherwise. Credit Cycle is the Excess Bond Premium from Gilchrist and Zakrajšek (2012). In column (5) we control for the logarithm of loan maturity interacted with the Term B dummy (double interaction) and the standardised facility-level average relationship of the borrower with all syndicate members interacted with the Term B dummy and the Excess Bond Premium (triple interaction). The relationship for each borrower-bank pair is defined as the share of borrower i's loan volume in the prior five years that has been provided by the respective bank. Our sample includes *all loans* (credit lines + term loans + other loan types) originated between 2000 and 2020Q1. The Excess Bond Premium is standardized to have mean 0 and standard deviation of 1. Standard errors are double clustered at the firm and month. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - Loan Volume

	Log(Facility Amount)				
	(1)	(2)	(3)	(4)	(5)
Excess Bond Premium	−0.099***	−0.081***			
	(0.017)	(0.014)			
Term B	0.512***	0.450***	0.419***	0.546***	0.423***
	(0.031)	(0.033)	(0.031)	(0.040)	(0.037)
Excess Bond Premium x Term B		−0.185***	−0.208***	−0.284***	−0.268***
		(0.035)	(0.032)	(0.050)	(0.044)
Borrower FE	Y	Y	Y	N	N
Year-Month FE	N	N	Y	N	N
Deal FE	N	N	N	Y	Y
Maturity Controls	N	N	N	N	Y
Relationship Controls	N	N	N	N	Y
Obs.	56,386	56,386	56,386	16,752	14,460
R^2	0.727	0.728	0.766	0.808	0.812

Panel B - Loan Spreads

	All-in-drawn Spread				
	(1)	(2)	(3)	(4)	(5)
Excess Bond Premium	13.640***	10.313***			
	(2.435)	(2.418)			
Term B	50.371***	61.251***	63.754***	25.160***	8.386**
	(3.143)	(3.002)	(3.056)	(2.746)	(3.973)
Excess Bond Premium x Term B		32.739***	31.359***	21.532***	34.558***
		(4.277)	(4.197)	(3.329)	(4.381)
Borrower FE	Y	Y	Y	N	N
Year-Month FE	N	N	Y	N	N
Deal FE	N	N	N	Y	Y
Maturity Controls	N	N	N	N	Y
Relationship Controls	N	N	N	N	Y
Obs.	56,386	56,386	56,386	16,752	14,460
R^2	0.596	0.598	0.626	0.738	0.745

Table A4: Robustness: Private Borrowers - Within-Deal Results

This table reports results at the individual loan facility level. We estimate

$$\text{Lending Outcome}_{idft} = \delta_{idt} + \beta \text{Credit Cycle}_{t-1} \times \mathbb{I}_{f=\text{TermB}} + \epsilon_{idft}$$

where Lending Outcome$_{idft}$ is either the logarithm of the loan issuance volume (Panel A) or the all-in-drawn spread (Panel B) at origination to borrower i for deal d, tranche-type f which is either a Term A loan or Term B loan, in month t. $\mathbb{I}_{f=\text{Term B}}$ is a dummy variable that takes value of 1 if the loan is a Term B loan and 0 otherwise. Credit Cycle is the Excess Bond Premium from Gilchrist and Zakrajšek (2012). In column (5) we control for the logarithm of loan maturity interacted with the Term B dummy (double interaction) and the standardised facility-level average relationship of the borrower with all syndicate members interacted with the Term B dummy and the Excess Bond Premium (triple interaction). The relationship for each borrower-bank pair is defined as the share of borrower i's loan volume in the prior five years that has been provided by the respective bank. Our sample includes all term loans originated between 2000 and 2020Q1 for *non-publicly traded firms*. The Excess Bond Premium is standardized to have mean 0 and standard deviation of 1. Standard errors are double clustered at the firm and month. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - Loan Volume

	Log(Facility Amount)				
	(1)	(2)	(3)	(4)	(5)
Excess Bond Premium	−0.104***	−0.072***			
	(0.020)	(0.017)			
Term B	0.607***	0.571***	0.532***	0.497***	0.502***
	(0.024)	(0.025)	(0.022)	(0.030)	(0.035)
Excess Bond Premium x Term B		−0.102***	−0.114***	−0.123***	−0.118***
		(0.027)	(0.023)	(0.037)	(0.042)
Borrower FE	Y	Y	Y	N	N
Year-Month FE	N	N	Y	N	N
Deal FE	N	N	N	Y	Y
Maturity Controls	N	N	N	N	Y
Relationship Controls	N	N	N	N	Y
Obs.	18,084	18,084	18,084	5,480	4,644
R^2	0.783	0.784	0.825	0.891	0.893

Panel B - Loan Spreads

	All-in-drawn Spread				
	(1)	(2)	(3)	(4)	(5)
Excess Bond Premium	13.288***	−5.512			
	(3.373)	(3.715)			
Term B	−51.987***	−31.400***	−27.580***	−97.858***	−105.931***
	(6.096)	(5.549)	(5.668)	(8.349)	(8.800)
Excess Bond Premium x Term B		59.412***	58.208***	61.132***	62.483***
		(5.645)	(5.691)	(9.353)	(11.598)
Borrower FE	Y	Y	Y	N	N
Year-Month FE	N	N	Y	N	N
Deal FE	N	N	N	Y	Y
Maturity Controls	N	N	N	N	Y
Relationship Controls	N	N	N	N	Y
Obs.	18,084	18,084	18,084	5,480	4,644
R^2	0.544	0.551	0.580	0.720	0.767

Table A5: Robustness: Relationship Measures - Within-Deal Results

This table reports results at the individual loan facility level. We estimate

$$\text{Lending Outcome}_{idft} = \delta_{idt} + \beta\text{Credit Cycle}_{t-1} \times \mathbb{I}_{f=\text{TermB}} + \epsilon_{idft}$$

where Lending Outcome_{idft} is either the logarithm of the loan issuance volume (Panel A) or the all-in-drawn spread (Panel B) at origination to borrower i for deal d, tranche-type f which is either a Term A loan or Term B loan, in month t. $\mathbb{I}_{f=\text{Term B}}$ is a dummy variable that takes value of 1 if the loan is a Term B loan and 0 otherwise. Credit Cycle is the Excess Bond Premium from Gilchrist and Zakrajšek (2012). Each column controls for the logarithm of loan maturity interacted with the Term B dummy (double interaction) and the standardised facility-level average relationship of the borrower with all syndicate members interacted with the Term B dummy and the Excess Bond Premium (triple interaction). The relationship for each borrower-bank pair is defined as the share of borrower i's loan volume in the prior 3 years (5 years in column (5)) that has been provided by the respective bank. The relationship measure for each borrower-bank pair differs across specification based on which past loans are included (all loans, only TLA and only if bank was lead arranger) and over how which prior period the relationship is measured. The facility-level measure is either defined based on the syndicate of the respective facility or on the syndicate of the same deal's TLA syndicate. Our sample includes all term loans originated between 2000 and 2020Q1. The Excess Bond Premium is standardized to have mean 0 and standard deviation of 1. Standard errors are double clustered at the firm and month. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - Loan Volume

	Log(Facility Amount)				
	(1)	(2)	(3)	(4)	(5)
Term B	0.430***	0.425***	0.448***	0.422***	0.433***
	(0.027)	(0.026)	(0.026)	(0.027)	(0.028)
Excess Bond Premium x Term B	−0.157***	−0.167***	−0.169***	−0.154***	−0.149***
	(0.033)	(0.033)	(0.032)	(0.035)	(0.034)
Relationship Measure					
Included Loans	All Loans	All Loans	TLA	Creditline	All Loans Lead
Period	3 Years	3 Years	3 Years	3 Years	3 Years
Syndicate	Both	TLA	TLA	TLA	Both
Borrower FE	N	N	N	N	N
Year-Month FE	N	N	N	N	N
Deal FE	Y	Y	Y	Y	Y
Maturity Controls	Y	Y	Y	Y	Y
Obs.	6,112	6,128	6,128	5,830	6,112
R^2	0.900	0.900	0.900	0.901	0.900

Robustness: Relationship Measure - Within-Deal Results - Continued

Panel B - Loan Spreads

	All-in-drawn Spread				
	(1)	(2)	(3)	(4)	(5)
Term B	−98.867***	−70.315***	−78.862***	−64.257***	−69.754***
	(7.768)	(8.018)	(8.112)	(8.031)	(7.818)
Excess Bond Premium x Term B	79.404***	103.633***	98.504***	102.356***	104.013***
	(9.087)	(9.484)	(9.547)	(10.146)	(9.004)
Relationship Measure					
Included Loans	All Loans Lead	All Loans	TLA	Creditline	All Loans
Period	3 Years	3 Years	3 Years	3 Years	5 Years
Syndicate	Both	TLA	TLA	TLA	Both
Borrower FE	N	N	N	N	N
Year-Month FE	N	N	N	N	N
Deal FE	Y	Y	Y	Y	Y
Maturity Controls	Y	Y	Y	Y	Y
Obs.	5,694	5,704	5,704	5,448	5,694
R^2	0.786	0.738	0.738	0.736	0.739