Fragile Financing?
How Corporate Reliance on Shadow Banking Affects their Access to Bank Liquidity

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This version: April 28, 2025*

Abstract

Greater reliance on nonbank financing makes firms fragile as it leads banks to limit their access to credit lines. Besides demonstrating this result in panel tests subject to range of controls and robustness checks, we employ the 2014–16 oil-price collapse as an exogenous rollover risk in nonbank financing of non-oil-sector firms by collateralized loan obligations (CLOs) exposed to oil sector firms. Nonbank-reliant firms with looming maturities faced reductions and wider spreads in bank credit lines after the shock, resulting in weaker financial and real performance in spite of their drawdowns of existing credit lines.

JEL classification: G01, G21, G23
Keywords: Nonbank financing, CLOs, Rollover Risk, Credit Lines, Syndicated Loans, Oil Price Shock

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1 Introduction

Over the past two decades, we have observed a substantial growth in assets under management at "shadow banks" or nonbank financial institutions; see Acharya et al. (2024a), among others. At the same time, there has been a noticeable increase in nonbank funding for large corporations.[1] Figure 1, Panel A shows that nonbank term loan originations have exceeded bank term loan originations over most of the sample period from 2000 Q1 to 2022 Q1. Irani et al. (2021) also find that in 2017 approximately 75% of term loans provided to non-financial corporations were originated by nonbank lenders. Furthermore, nonbank-funded firms are large and economically important (see Figure 1, Panel B), surpassing in size borrowers that are entirely bank-dependent, again highlighting the growing importance of nonbank lending as a key source of corporate financing.[2]

However, nonbank lending or "shadow banking" - which we use synonymously - is characterized by a lack of stable and insured deposit base. Nonbanks also lack access to an explicit government or central bank backstop for emergency liquidity. Thus, opting for nonbank financing potentially introduces rollover risk into a firm's capital structure (Irani et al. 2021, Fleckenstein et al. 2024). As a result, in periods of market stress, firms that rely on nonbanks may have to turn elsewhere for funding. A natural question then is whether bank credit lines are available to these firms for drawing down at attractive terms relative to rollover costs when market-wide risk increases and other credit options become scarce.[3]

The COVID-19 outbreak in March 2020 provides a prime and recent example of a large and unexpected market-wide shock wherein we witnessed a large decline in the issuance

[1] The growth in the secondary market for corporate loans, which has tripled since 2010, has also facilitated the rise in nonbank lending (Saunders et al. 2025).

[2] In related work, Buchak et al. (2024) document a decrease in lending via bank balance sheets and increasing intermediation via nonbanks. They attribute this development to a decline in bank deposits as well as regulation. Berg et al. (2021) discuss trends in corporate borrowing over the last two decades, particularly the increasing importance of nonbank lenders in the syndicated corporate loan market.

[3] Theoretical work (Boot et al. 1987, Thakor and Udell 1987, Shockley and Thakor 1997) and empirical work (Berg et al. 2016, Acharya et al. 2013) has emphasized the drawdown option in credit lines. Acharya et al. (2013) and Berg et al. (2016) show that credit line utilization rates are higher when idiosyncratic borrower risk increases as well as in market-wide stress periods.

of nonbank loans as money flowed out of collateralized loan obligation (CLO) vehicles and mutual funds, two of the largest nonbank investors.[4] This period was also accompanied by a large drawdown in bank credit lines and a surge in preference for cash over credit lines across the entire corporate sector (Acharya and Steffen 2020, Kashyap 2020). We see, importantly though, that firms with an above-median level of pre-COVID dependence on nonbanks – measured as the ratio of term loans of a firm held by nonbanks relative to all term loans – utilized a larger portion of their credit lines (exceeding 10% by April 2020), relative to borrowers with lower exposure to nonbanks (Figure 2). Table 1 confirms this econometrically. Borrowers with greater nonbank dependence in term loan borrowing were more likely to draw down bank credit lines during the COVID-19 outbreak (March-June 2020), and conditional on drawdown had higher utilization rates as well.

Given these motivating facts, we ask in this paper how the increase in nonbank funding dependence of firms has altered the provision of liquidity insurance by banks to non-financial firms. We specifically seek to determine whether banks, in their role as liquidity providers, take into account the financing sources of borrowers when making lending decisions. In times of market-wide stress, banks may experience a shift in credit allocation to firms from nonbanks to their own balance sheets via credit line drawdowns, potentially raising liquidity and capital encumbrance at banks. If, in anticipation of such adverse spillovers or upon their unexpected realization, banks decide against extending credit lines to borrowers dependent on nonbank financing, then financial stress to nonbank borrowers can get exacerbated due to the lack of *both* bank and nonbank funding sources. Documenting empirically that reliance on nonbank funding is indeed associated with such fragility for borrowers is the key contribution of our paper.

Our focus is on syndicated loan originations to large, nonfinancial corporations—a market exceeding $2.9 trillion in outstanding volume as of 2022 ($5.9 trillion including credit lines).[5]

[4] Around 86% of leveraged loans are now held by institutional investors, mainly CLOs and mutual or hedge funds, constituting nearly 96% of this segment (Saunders et al. 2025).

[5] See https://www.federalreserve.gov/newsevents/pressreleases/files/bcreg20230224a1.pdf

We measure a firm's nonbank dependence as the volume of institutional (Term Loans B–K) financing held by nonbank investors, divided by total term loans. In other words , we classify Term Loan A tranches as "bank" loans (retained on bank balance sheets) and Term Loans B–K as "nonbank" loans (placed predominantly with institutional investors).[6] Figure 3 shows that, while nonbank funding often exceeds 60% of a firm's term loans, it temporarily dips during systemic shocks—such as the 2008–09 financial crisis, the 2014–16 oil price collapse, and the onset of COVID-19—underscoring the cyclicality and fragility of nonbank supply. For credit line access, we gauge the share of bank revolvers in a firm's total liquidity (cash plus credit lines), as in the work of Sufi (2009), and in total lending (bank plus nonbank loans plus committed lines).

We first document a negative relationship between a firm's nonbank dependence and its credit line access, which holds both when looking at contemporaneous origination of credit lines and nonbank loans and also when looking at the stock of outstanding credit lines and term loans. In terms of economic magnitude, moving from a completely bank-dependent to a completely nonbank-dependent borrower leads to a reduction in credit lines issued as a share of total loans by 17.6 ppt and as a share of total liquidity by 3.5 ppt. Borrowers with greater nonbank exposure are also associated with more expensive credit lines. A borrower with only nonbank term loans pays, on average, 46.9 bps higher drawn spreads and a 7.6 bps higher undrawn spread relative to a borrower with only bank term loans. This is an economically meaningful increase, equivalent to 25% of the mean drawn and undrawn spread respectively.

However, an important concern is that this negative correlation need not imply causality. Banks could simply be screening out higher-risk firms—originating "nonbank" loans for those they do not wish to hold on balance sheet—and these same firms might also struggle to obtain credit lines. Relatedly, relationship lending may matter: if nonbanks provide arm's-length financing (Rajan 1992), firms with minimal bank relationships could end up more reliant on

[6] We discuss alternate classifications and robustness in Section 3.2

nonbanks and less able to secure bank liquidity insurance. To address this concern, we control directly for bank-borrower relationship strength and still find that nonbank-dependent firms receive fewer and costlier credit lines.

Beyond bank-firm relationships, bank-nonbank matching could also distort the results. For instance, banks with low deposit-to-asset ratios tend to originate more nonbank loans (Kashyap et al. 2002, Fleckenstein et al. 2024), potentially causing our observed correlation. Yet, even when comparing borrowers of the *same bank* in the *same quarter*—and when tracking changes in nonbank dependence within the *same bank-borrower pair*—we confirm that greater reliance on nonbanks coincides with smaller (and more expensive) credit lines.

Finally, regulatory constraints might prevent banks from lending to certain borrowers, such as negative-EBITDA firms (Chernenko et al. 2022). If these borrowers resort to nonbanks out of necessity, we could again observe spurious correlations. Consistent with that possibility, we see far fewer credit lines for negative-EBITDA firms. However, this pattern does not extend to bank term loans, nor does restricting our sample to positive-EBITDA borrowers eliminate the negative relationship between nonbank dependence and credit line access. In short, multiple robustness checks suggest an economically significant and robust link between nonbank financing and limited bank-provided liquidity.

Notwithstanding these robustness checks, causal identification ideally requires exogenous variation in nonbank lending. In reality, such shifts are rarely random. Hence, we exploit the 2014–16 oil price collapse—a severe, unexpected decline of about 70% – as a plausibly exogenous shock to the rollover risk of nonbank financing for non-oil-sector firms. Let us elaborate. Stock prices of oil and gas firms declined as did their loan prices in the secondary corporate loan market. This in turn triggered a sharp drop in collateralized loan obligation (CLO) issuances, as some CLO managers were heavily exposed to oil-related firms.[7] As a result, primary market issuance of nonbank term loans (TLB tranches) also contracted.

[7]Post the global financial crisis, approximately 86% of loans from leveraged firms were held by institutional investors. Notably, almost 96% of this portion is accounted for by CLOs along with mutual or hedge funds (Saunders et al. 2025).

Importantly, however, this was neither an aggregate downturn for the economy nor was it a meaningful threat to banking sector health.

Crucially, as some of the CLOs were close to breaching covenants, they were forced to also offload loans to firms who were *not* exposed to the oil-price shock ("innocent bystanders" in the analysis by Kundu (2023)). We thus focus on credit outcomes of these borrowers as the shock to nonbank credit supply then only arises through managers' oil-sector exposures rather than the borrowers' fundamentals. Moreover, we stratify firms by rollover risk— that is, with looming TLB maturities —where a sudden withdrawal of nonbank funding is more likely to matter. This setting thus offers a quasi-experimental window to test how banks respond in providing liquidity and credit to a borrower whose nonbank lenders pull back for exogenous reasons.

We construct a panel of firms from January 2012 through December 2017 to capture nine quarters before the oil price collapse (2012Q1–2014Q1), six quarters during the collapse (2014Q2–2015Q4), and eight quarters afterward. We focus on firms outside the oil and gas sector to avoid any direct effects of the shock on firms. Consistent with our identification strategy, we first confirm that *nonbank* financing contracted severely for all firms who were relying on CLOs heavily exposed to oil and gas firms. Particularly affected were those companies facing higher rollover risk (i.e., borrowers that had maturing term loans during the oil-price shock).

Notably, and consistent with our earlier findings, bank credit lines *increased* for firms whose nonbank funding declined—but only if they did not require immediate refinancing. Bank lenders likely anticipated a reduced future reliance on nonbank funding and were therefore willing to expand their liquidity provision to these firms. Conversely, banks reduced liquidity provision to firms with immediate refinancing needs from nonbanks (and whose nonbank funding declined too). Before the oil-price shock, changes in credit line lending to both groups of firms hovered around zero, reinforcing the argument that the shock triggered a divergence in bank credit line lending between firms with maturing and non-maturing

nonbank term loans. Consistently, after the oil-price shock, spreads were higher for firms with maturing nonbank term loans, both relative to their pre-shock levels and compared to firms without maturing nonbank term loans. In other words, using a plausibly exogenous shock to nonbank funding, we find evidence supporting our earlier hypothesis: banks account for the potential and realized higher drawdown risks of firms financed by nonbanks and accordingly provide more (less) liquidity to firms that are less (more) dependent on nonbank funding.

We conduct several robustness tests to address alternative explanations. First, the oil-price shock coincides with the introduction of the Leveraged Lending Guidance, raising the possibility that the observed shift from nonbank to bank lending among CLO-exposed firms might result from regulatory actions rather than CLO-specific shocks. However, by studying changes within banks that were affected or by the leveraged lending guidelines, we confirm that the changing regulation does not account for our findings. Moreover, it could be that firms with maturing and non-maturing loans are different. The former firms might be riskier and therefore obtained shorter loan maturities when originating their loans. To investigate this, we compare the distributions of original loan maturities for firms with and without maturing loans during our sample period and find no significant differences, mitigating concerns related to borrower risk heterogeneity driving our results.

Our findings indicate that firms with maturing nonbank term loans experienced not only a sharp decline in nonbank lending but also a significant reduction in bank credit line originations and higher borrowing costs—a "double whammy" effect. This raises an important question: how did these firms continue to manage their liquidity? We show that they responded by substantially increasing their credit line utilization during the oil-price shock period. This also had notable implications for their investment decisions, as we observe a significant reduction in both assets and capital expenditures. At the same time, their cash holdings and the proportion of cash relative to total liquidity remained unchanged, supporting the interpretation that these firms were rendered financially constrained and

sought to preserve cash.

Overall, these results suggest that in stress times it is costly for firms to be nonbank financed. Thus, there must be compensating benefits for firms at other times. We investigate the loan spread differences of bank and nonbank loans within a loan deal (i.e., holding borrower risk and other factors constant) and find – consistent with the literature (Ivashina and Sun 2011)– that nonbank loans are typically about 100bps cheaper on average, even though the difference reduces (and even reverses) during stress times.[8]

Collectively, our evidence suggests that heavy reliance on nonbanks increases borrower fragility to nonbank financing shocks and constraints their access to bank-provided liquidity. This dynamics underscores the fragility of financing associated with the expanding role of nonbank lending in corporate finance.

1.1 Literature Review

Our paper relates to different strands of the literature. First, it relates to a growing literature on syndicated corporate loan sales and (indirect) nonbank lenders such as CLOs (e.g. Drucker and Puri 2008, Ivashina and Sun 2011, Nadauld and Weisbach 2012, Benmelech et al. 2012, Irani and Meisenzahl 2017, Berlin et al. 2020, Giannetti and Jang 2024, Gustafson et al. 2021, Blickle et al. 2020, Cordell et al. 2023, Fleckenstein et al. 2024, Haque et al. 2024). The existing literature highlights the benefits of institutional investors in the secondary loan market as to, for example, ex-ante better access to (term) loans and lower cost of credit. Berlin et al. (2020) document that banks retain control rights through monitoring while institutional term loans are frequently "covenant-lite" which contributed to the growth in the institutional loan market. We show that banks reduce the provision of contingent liquidity in the form of credit lines to corporations that are reliant on nonbank funding. Borrowers with greater nonbank exposure also find it more expensive to borrow through credit lines.

[8]See Appendix Figure A1.

Irani et al. (2021) and Fleckenstein et al. (2024) document an increase in fragility to market-wide stress because of the growth in nonbank lending due to, for example, elevated rollover risk and the cyclicality associated with nonbank credit. We document that borrowers with greater nonbank dependence in term loan borrowing were more likely to draw down bank credit lines during the COVID-19 outbreak when rollover risk materialized. Reliance on nonbank funding by corporations leads to fragility and banks preemptively reduce liquidity provision in the form of credit lines.

Our paper also relates to the large literature on the role of credit lines in corporate liquidity management.[9] One strand of this literature highlights as primary driver for firms to acquire contingent credit an insurance-oriented motive (Campbell 1978, Boot et al. 1987, Holmström and Tirole 1998, Gatev and Strahan 2006), other papers highlight that, while credit lines share similarities with cash reserves, they seem to fulfill a unique and complementary role, in particular as a liquidity backstop when firms' regular cash flows are under stress (Opler et al. 1999, Almeida et al. 2004, Sufi 2007, Lins et al. 2010, Acharya et al. 2014).[10] Consistently, firms tend to tap into these credit lines specifically when such risks emerge or appear imminent (Jiménez et al. 2009, Campello et al. 2011, 2012). Our paper shows that a firm's funding sources may also affect their access to bank credit lines and in turn the trade off between cash and credit lines.

Another set of papers shifts attention towards aggregate drawdowns of credit lines by non-financial firms during periods of widespread economic stress. Ivashina and Scharfstein (2010) and Acharya and Mora (2015), for example, highlight a double bank run during the global financial crisis of 2008-2009 when firms ran on both bank deposits and credit lines, particularly, when firms and banks are financially constrained (Ippolito et al. 2016, Hanson et al. 2015, Santos 2012). Other papers document a "dash for cash" during the COVID-19

[9] Acharya et al. (2024b) provide an in-depth overview of the literature.

[10] In a recent theory paper, Donaldson et al. (2024) highlight a possible role of credit lines to mitigate debt dilution. Lenders might avoid extending new term loans when firms are more likely to draw down credit lines thereby diluting their claims. We show (causally) that banks ex-ante reduce credit lines of firms with nonbank funding that are subject to high expected rollover risk.

pandemic, when firms drew down pre-arranged credit lines with far greater intensity than in past recessions (Acharya and Steffen 2020, Kashyap 2020, Acharya et al. forthcoming, Greenwald et al. 2023) to obtain liquidity that was immediately redeposited with banks (Cooperman et al. 2023). Chodorow-Reich et al. (2022) document that small firms lack access to liquidity insurance during COVID-19 while large firms disproportionately drew down their credit commitments. We show that these drawdowns are correlated to the firm's funding sources, and, in particular, to their dependence on nonbanks.

Our paper is also related to the literature on bank competition in direct lending by nonbanks (e.g. Carey et al. 1998, Denis and Mihov 2003, Chernenko et al. 2022). More recent papers emphasize the emerging importance of FinTechs (Buchak et al. 2018, Gopal and Schnabl 2022) or private debt funds (Davydiuk et al. 2024, 2023, Jang 2024, Erel et al. 2024). The existing literature highlights that nonbank lenders differ from banks, as they typically serve (riskier or smaller, middle-market) borrowers which banks are less willing to lend to, for example, because of regulatory constraints. A recent paper by Haque et al. (2024) investigates lending by private debt lenders vs. banks to the same borrower. They show that private debt lenders do not compete with banks in the provision of liquidity via credit lines but are replacing banks in riskier term loan provision. Their sample focuses on smaller firms (so-called middle-market firms) than firms in our analysis, and, in contrast to their results that banks increase credit lines when private debt lenders participate as junior lenders, we document that banks *tighten* the provision of credit lines to firms that are subject to rollover risk when financed (indirectly) by nonbanks (such as CLOs).

Finally, recent literature, e.g., Acharya et al. (2024a), Acharya et al. (2025), and Chernenko et al. (2025) has also documented growing linkages between banks and some significant categories of nonbanks through credit lines (e.g., real estate investment trusts or REITs and private credit providers such as business development companies or BDCs). However, in our setting, CLOs cannot draw down on credit lines to transfer credit to non-financial borrowers and offset the lack of bank liquidity. To elaborate, CLOs use bank credit lines during the

warehousing period but eventually CLO issuance and purchase of loans requires inflow of funds from investors. As it becomes harder for CLOs to issue lower-rated tranches during stress periods (Fleckenstein et al. (2024)), CLO issuance and nonbank funding to borrowers drop. This is unlike REITs or private credit providers that can draw down on credit lines for direct investment; besides, these NBFIs also have majority holdings in a borrower or property, unlike a syndicated loan that is typically split across hundreds of CLOs. These factors make our specific nonbank setting of CLOs distinct and yet important to understand how bank liquidity to borrowers is affected through indirect nonbank-borrower relationships.

2 Institutional Background and Framework

A critical funding source for medium- and large-sized U.S. corporations is the syndicated loan market, in which one or more "lead arrangers" structure a loan package and then distribute the loan among a syndicate of lenders. In this setting, banks and nonbank institutional investors play complementary roles: banks typically provide revolving credit facilities and "Term Loan A" tranches (TLA), while nonbanks—such as collateralized loan obligations (CLOs), loan mutual funds, and private credit funds—are the principal buyers of "Term Loan B" (TLB) tranches. A syndicated "deal" often comprises several of these facilities. Despite being part of a single loan package, these facilities differ in amortization profiles, pricing, and, importantly, ultimate investors. This difference lies at the heart of our study on the interplay between nonbank funding and bank liquidity provision.

Deal structures. Appendix Figure A2 in shows the evolution of syndicated loan deal structures (loan facilities as a percentage of total deal size) in the syndicated loan market over time. TLB has become the most prevalent form of financing in the syndicated loan market with a facility size comprising around half of total term loans to a borrower. Deal structures are highly cyclical and bank financing (via TLA or credit lines) increases vis-a-vis TLB funding during periods of aggregate stress such as the GFC, the oil & gas shock or the

COVID-19 pandemic (Fleckenstein et al. (2024)).

TLA tranches typically feature shorter maturities and amortizing structures (likely due to banks' internal risk management and regulatory constraints) and remain largely on bank balance sheets. By contrast, TLB tranches—often referred to as "institutional tranches"—usually carry bullet repayments and have longer maturities.[11] It is important to note that while TLBs are still originated by an underwriting bank (or group of banks), the lead arranger typically places or sells these tranches to nonbank institutional investors in the secondary market soon after origination. Offloading TLB exposures allows banks to free up balance sheet capacity. Nonbanks, not bound by the same regulations as banks, can finance riskier or higher-yielding corporate loans—an arrangement that has driven growth in the institutional loan market. However, it also exposes TLB borrowers to potentially volatile market-based funding conditions (Fleckenstein et al. 2024).[12]

Credit lines. Banks typically also provide credit lines—an essential form of corporate liquidity insurance—within leveraged loan deals. Because they rely on deposit funding and central bank facilities, banks can more effectively manage liquidity risk, allowing borrowers to draw on revolvers at a pre-agreed spread making banks the optimal credit-line providers (Kashyap et al. 2002, Gatev and Strahan 2006). Until drawn down, these revolvers remain off bank balance sheets. However, when market-wide risk spikes and borrowers tap lines en masse, banks' own balance sheets can come under pressure (Acharya et al. forthcoming), highlighting the trade-offs inherent in offering such liquidity commitments.

Rollover risk of nonbank loans. When market-wide stress (or borrower-specific distress) arises, a firm's first recourse might be to draw on the revolving facility, avoiding the higher cost of issuing new debt in a dislocated market. Significant drawdowns can strain

[11] Online Appendix Figure OA1 shows spreads as well as maturities of different syndicated loan tranches over time.

[12] We document evidence consistent with cyclicality in institutional investor funding in Online Appendix OA1.2, we show that loans have a lower likelihood to be sold in the secondary market (Panel A of Figure OA3), take somewhat longer to be launched if they are traded (Panel A of Figure OA4), and carry steeper discounts (Panel A of Figure OA5). These effects are even more pronounced for oil and & gas firms (see Panel B of Figures OA3, OA4, OA5), particularly during the oil & gas crisis. That is, their funding is even more exposed to volatile market conditions.

bank balance sheets, particularly if a simultaneous wave of borrowers taps their revolvers.

Corporate borrowers might benefit from the synergy of cheap nonbank financing (via TLB) during stable times and stable bank credit lines if a shock materializes. However, this arrangement also introduces rollover risk in TLB and potential constraints on bank credit lines when many borrowers turn to banks at once.

One central premise in our study is that TLB tranches carry significant refinancing (or "rollover") risk. By design, TLB tranches often have bullet maturities—i.e. principal is repaid at maturity rather than gradually. If nonbank investors become unwilling to roll over (refinance) the loan, the borrower faces a sudden funding gap. In principle, a bank-provided revolver can help bridge shortfalls. Banks, however, anticipating these drawdown pressures, may scale back or price up revolvers for borrowers heavily reliant on nonbank financing. This leads to the possibility of a *"double whammy"* effect in bad times: Nonbank lenders pull back or refuse to refinance TLB, and banks, in anticipation of widespread drawdowns, tighten revolver capacity or terms for these same borrowers.

Implications. Building on this institutional setting, our analysis centers on two related questions. First, do banks ration or increase the cost of revolvers for firms that rely heavily on nonbank term loans (TLB)? Second, does such nonbank dependence heighten rollover risk during stressed periods, limiting both new and existing bank lines and amplifying borrower vulnerability? We address these issues in the following sections.

3 Data and Summary Statistics

3.1 Data

To investigate the effect of nonbank funding on bank liquidity provision, we construct a dataset using different sources, which we describe below.

Loan data. We obtain data on new originations of syndicated loans from Refinitiv DealScan. We focus on syndicated loans originated and refinanced in the United States to

non-financial companies between 2000Q1 and 2022Q4. We proxy for a loan refinancing if an already originated loan is amended with a change in loan spread and maturity. Each origination and refinancing is considered a new facility. We obtain secondary market loan prices from the Loan Syndication and Trading Association (LSTA).

Company data. To obtain borrower financial information, including credit ratings, we merge the borrowers in Dealscan to Compustat via the legacy Dealscan version using the link provided by WRDS, the Dealscan-Compustat link file provided by Chava and Roberts (2008) from April 2018, and augmentations to the DealScan-Compustat Link obtained from Jan Keil's website ((Keil 2018)). Roughly 30% of the facilities in DealScan are public firms we can match to the Compustat data. We use CapitalIQ to track credit line drawdowns of borrowers on a quarterly basis (daily basis during COVID-19). Stock returns are from CRSP.

CLO data. We obtain data on CLO tranches, and holdings from Creditflux, which in turn extracts these data from monthly trustee reports that CLOs provide to their investors. Creditflux captures the near universe of CLO tranches and the majority of holdings since approximately 2005. All variables used in the paper are described in Appendix Table A4

3.2 Nonbank Dependence

We define *Nonbank Dependence* as the share of total term loans (Term Loans B–K) that are financed by nonbanks.[13]. In our setting, we calculate nonbank dependence in each quarter for a borrower based on outstanding (un-matured) loans. We use the "tranche-type" field in Dealscan and classify all "Term Loan A" tranches as bank loans and all "Term Loan B", "Term Loan C"... tranches jointly as nonbank loans. We include all tranches designated as "Term Loan" (i.e., without A, B, C,...) in the bank loan category to be conservative, as they are not clearly identifiable as nonbank loans. We plot *Nonbank Dependence* in Figure 3

[13]This approach follows the classification of loan tranches based on industry practice (Standard and Poors 2020) and prior academic literature (Ivashina and Sun 2011, Nini 2008, Fleckenstein, Gopal, Gutierrez, and Hillenbrand 2024)

based on loan origination data from Dealscan. In Panel A, we plot the nonbank shares based on loans originated in a given quarter. In Panel B, we plot the nonbank dependence measure used in the paper, calculated for each borrower-quarter based on their outstanding loans. There is noticeable increasing trend in nonbank share and nonbank dependence over time. Nonbank share is also procyclical, declining during periods of economic weakness (such as the GFC and COVID-19 recessions as well as during the oil-price shock period) and increasing when the economy is booming. Nonbank dependence also increased significantly in the early 2000s, followed by a decline during the GFC and post-COVID-19.

As robustness tests, we construct two alternative measures of *Nonbank Dependence*. In the first alternate measure, we assign all "Term Loans" to the nonbank (Term Loan B) category. In the second measure, we include those term loans as either nonbank or bank loan if the "Market Segment" field in Dealscan assigns them as institutional (i.e., nonbank) or pro-rata (i.e., bank) loan. All other loans in the "Term Loan" tranche-type field are dropped. Our preferred method, used in the paper, classifies all "Term Loans" as bank term loans as described above. Panel A of Appendix Figure A2 shows that, in fact, the trends in "Term Loan" origination very closely mirror those on bank term loan originations, and move counter to the origination of nonbank loans. Panel B and C of Appendix Figure A2 plots the time-series of nonbank shares and nonbank dependce using all three different nonbank loan classifications. While the first alternative measure (TL=TLB) does not exhibit much variation, the second alternative measure (TL based on pro-rata) and our preferred measure (TL=TLA) closely follow each other. Table 2 shows that the nonbank dependence used in our paper and the nonbank dependence calculated using the market segment classification have over 96% correlation at the borrower-quarter level, and 99% correlation in the quarterly level data lending support to classifying the remaining "Term Loans" to the bank loan category.

3.3 Summary Statistics

Table 3 presents the summary statistics. In Panel A, we present the descriptive statistics for all borrowers. In Panel B, we split borrowers by those that have dependence on nonbanks (TLB borrowers) and those without any nonbank dependence in a given year-quarter.

Conditional on having loans from nonbanks, the average firm receives 79% of its term loans from nonbanks.The average firm has about $8.9 billion in assets, with smaller borrowers being bank reliant relative to nonbank borrowers ($7.71 bil. vs. $12.71 bil.). Firms also hold about 10% of their assets in the form of liquid cash. A majority of the firms in our sample are unrated. This fraction, however, is significantly larger for bank-dependent borrowers with 61% of these borrowers having no credit rating while only 40% of nonbank borrowers have no credit rating.

Credit lines are a common source of liquidity for borrowers. 95% of borrower-quarter pairs have access to credit lines, with the occurrence slightly higher for bank borrowers relative to nonbank borrowers (96% vs. 92%). However, when we compare the size of credit lines as a share of either total loans to the borrower or total liquidity (cash + credit lines), bank borrowers have a significantly higher share. Bank borrowers have about 87% of their total credit in the form of credit lines relative to 38% for nonbank borrowers. Bank borrowers also get 68% of their liquidity in the form of credit lines compares to 63% for nonbank borrowers. Bank borrowers are able to borrow credit lines at much cheaper rates (drawn spread 168 vs 245 bps; undrawn spread 28 vs 44 bps). Overall, nonbank borrowers have slightly larger dollar amounts of credit lines drawndown ($100 mil vs. $92 mil) and lower total credit line commitment, on average, than bank borrowers ($541 mil. vs. $672 mil.). But, the average bank borrower credit line utilization at 22% is slightly greater than that for nonbank borrowers (19%).

These descriptive statistics suggest that nonbank borrowers receive fewer credit lines, and pay more for these credit lines. In the rest of the paper, we test these differences more rigorously and establish a causal impact of nonbank dependence on driving them.

4 Empirical Results

We begin by assessing whether a borrower's nonbank (institutional) financing correlates with reduced provision of bank credit lines. We then leverage the 2014–16 oil price shock as a plausibly exogenous contraction in nonbank supply to examine how both firms and banks respond in stressed conditions (Section 5).

4.1 Methodology

Our initial tests focus on how the availability and pricing of newly issued bank credit lines vary with a borrower's nonbank financing. Specifically, we estimate:

$$y_{i,j,t} = \alpha + \beta \times \text{Nonbank Dependence}_{i,t} + \sum \gamma \mathbf{X}_{i,t} + \nu_j \times \lambda_t + \pi_i \times \lambda_t + \delta_i + \epsilon_{i,t} \qquad (1)$$

where $y_{i,j,t}$ is either the volume or spread on newly issued credit lines to borrower i in industry j in quarter t. *Nonbank Dependence* is the share of total term loans (Term Loans B–K) financed by nonbanks. Our central hypothesis is that $\beta < 0$ for credit-line volume (i.e., higher nonbank use predicts fewer bank lines) and $\beta > 0$ for spreads (banks charge more when nonbank reliance is high).

We absorb time-varying demand and supply factors by including borrower (δ_i), industry-by-quarter ($\nu_j \times \lambda_t$) and rating-by-quarter ($\pi_i \times \lambda_t$) fixed effects. In addition, we control for key firm-level variables ($\mathbf{X}_{i,t}$)—size, leverage, rating, loan maturity, and deal purpose—to isolate the incremental impact of *Nonbank Dependence*. Standard errors are clustered at the borrower level.

4.2 Results

4.2.1 Descriptive analysis

We begin by exploring the relationship between credit line availability and nonbank funding in Figure 4. In Panel A, we measure credit line availability (CL) as the volume of credit lines relative to Total Loan Volume (credit lines + bank term loans + nonbank term loans). This ratio gauges the share of a firm's overall borrowing dedicated to credit lines.

Panel B instead plots credit lines as a fraction of available liquidity, defined as *CL + Cash*. The rationale is that firms can meet liquidity needs either by drawing on existing credit lines or by holding cash reserves (Sufi 2009, Acharya et al. 2013, Disatnik et al. 2013). Their choice depends on relative costs, spreads, and the firm's risk profile.

In both panels, after controlling for borrower- and time-specific fixed effects, we see that greater nonbank dependence in term loans correlates with lower credit line availability. Panel A indicates that firms with high nonbank reliance use fewer bank credit lines relative to total borrowing; Panel B shows that these same firms hold more cash relative to credit lines than their less nonbank-dependent counterparts. Together, the figures suggest that nonbank-financed borrowers substitute away from bank-provided liquidity, consistent with our hypothesis that banks scale back credit line provision when borrowers carry heavier nonbank exposure.

4.2.2 Access to credit lines.

We estimate Equation (1) using OLS and present the findings in Table 4.[14] Panel A regresses the share of newly issued credit lines (CL) on the borrower's nonbank dependence. In Columns (1)–(4), the dependent variable is *CL/Total Loans*, while Columns (5)–(8) replace the denominator with *CL+Cash*.

Credit Lines as a Share of Total Loans. In Column (1), a one-standard-deviation

[14] Appendix Table A1 presents the results using the alternate measures of nonbank dependence

increase in nonbank exposure (0.32) reduces CL/Total Loans CL/Total Loans by 8.1 ppt. Moving from all-bank to all-nonbank financing (a shift from 0 to 1 in nonbank dependence) lowers credit-line usage by 25.1 ppt. Although nonbank borrowers differ systematically from bank borrowers (Table 3), adding controls for borrower size, leverage, rating, loan purpose, and maturity—and progressively stronger fixed effects—shrinks but does not eliminate this effect. In the most stringent specification (Column 4), moving from fully bank-dependent to fully nonbank-dependent borrower cuts credit-line availability by 17.6 ppt.

Credit Lines as a Share of Liquidity. Replacing the denominator with total liquid resources yields a similar pattern. In Column (5), a complete shift from bank- to nonbank-financed borrowing decreases the credit-line share of liquidity by 5.7 ppt, falling to 3.5 ppt in Column (8) after controlling for borrower and loan characteristics. Thus, nonbank-dependent firms appear to rely more on cash reserves, while bank-dependent firms hold a larger fraction of liquidity in credit lines.

4.2.3 Cost of Credit Lines.

Having documented the negative relationship between credit-line volume and nonbank reliance, we now examine borrowing costs. Figure 5 plots both new (Panel A) and existing (Panel B) credit-line spreads against outstanding nonbank exposure. In both cases, drawn and undrawn credit spreads rise with nonbank dependence.

Panel B of Table 4 quantifies these spreads. Column 1 and 2 show that moving from zero to full nonbank dependence increases the drawn and undrawn spread by 48.5 bps and 7.6 bps respectively —about 25% of their respective mean spreads. There is no difference in the upfront or commitment fee paid by these borrowers (Coumns 3 and 4) while the total cost of borrowing is higher for nonbank borrowers. Thus, nonbank-financed borrowers face both fewer credit lines and higher costs of bank liquidity, consistent with the idea that banks perceive heightened risk stemming from nonbank fragility (Sufi 2009, Acharya et al. 2013).

Appendix Figures A3 and A4 additionally document the cost of term loans for borrowers

as a function of their nonbank dependence. Unsurprisingly, nonbank borrowers pay lower spreads on nonbank loans and a higher spread on bank loans.

4.3 Discussion: Covenants in Loan Facilities

So far, our results suggest that firms relying more on nonbank lenders face smaller, costlier credit lines from banks. Another dimension of *credit supply* is covenant tightness, which can restrict borrowers' ability to draw on existing lines (Chodorow-Reich et al. 2022). Although prior research indicates that nonbank financing often features weaker covenants (Ivashina and Vallee 2020), new evidence suggests banks may still impose strict terms on their portion of these deals (Berlin et al. 2020).

To capture this non-pricing channel, Table 5 replaces the dependent variable in Equation (1) with indicators for various covenant provisions documented in LSEG Dealscan (e.g., the presence of material restrictions, interest coverage ratios, or debt-to-cash-flow constraints). Despite similar overall covenant counts, we find that borrowers with greater nonbank reliance are significantly more likely to face material restrictions (+5 ppt), interest coverage covenants (+10 ppt), and debt-to-cash-flow caps (+8.7 ppt). These effects are sizable compared to sample averages, suggesting that banks respond to perceived fragility stemming from nonbank financing by tightening covenant clauses on credit lines—reinforcing the idea that nonbank-dependent borrowers face stricter bank lending terms.

4.4 Robustness and alternative hypotheses

So far, we have shown that borrowers relying more on nonbanks receive fewer and more expensive bank credit lines. However, this correlation does not necessarily imply that nonbank dependence causes worse terms. Banks may screen potential borrowers in ways that simultaneously increase nonbank use and reduce credit-line availability. Table 6 addresses such bank-borrower, bank-nonbank, and borrower-type selection concerns.

Bank–Firm Relationships. A lack of banking relationships might explain why nonbank-funded borrowers get fewer lines. In Column (2), we add a relationship strength control—the share of a borrower's total lending from a given bank over the past three years. Even after including this measure, nonbank dependence remains a strong predictor of lower credit lines and higher spreads, suggesting that relationship lending alone does not drive our results.

Bank–Nonbank Matching. Nonbanks often partner with particular banks, and low-deposit banks especially may prefer distributing TLBs (Fleckenstein et al. (2024), Kashyap et al. (2002)). This would suggest a negative correlation between TLB occurrence and CL issuance, but due to bank business model rather due to borrower financing conditions. In Column (3), we include bank-time fixed effects, comparing different borrowers at the same bank in the same quarter. The effect of nonbank dependence on credit lines remains large and significant, ruling out bank-level factors.

Borrower Selection. To isolate changes to credit lines as a borrower's own nonbank financing changes, Column (4) includes bank-borrower fixed effects, comparing within the same bank–firm relationship over time. An increase from 0 to 1 in nonbank dependence now reduces credit-line volume by 10.7 ppt and raises spreads by 29.1 bps. Even for borrowers that already hold a bank term loan (Column 5), higher nonbank dependence reduces credit-line access, albeit with somewhat smaller magnitudes.

Bank Regulation. Finally, we address whether supervisory constraints, such as the 2013 leveraged-lending guidelines, might bar banks from lending to certain borrowers (Chernenko et al. 2022). Negative-EBITDA firms indeed see lower bank credit-line access (Figure 6, Panel A), but not necessarily more nonbank term loans (Panel B). Table 7 restricts the sample to positive-EBITDA firms and, further, to those far above zero EBITDA. Our core results persist, indicating that the observed negative relationship between nonbank dependence and bank credit lines is not solely driven by regulatory restrictions on distressed borrowers.

Overall, nonbank dependence negatively correlates with bank-provided liquidity, even controlling for selection at the bank or borrower level and excluding negative-EBITDA firms.

This reinforces our conclusion that firms tapping nonbank markets face constraints when seeking bank credit lines.

5 Oil Price Shock

In the previous section, we have documented a robust, negative correlation between a firm's reliance on nonbank term loans and its access to bank credit lines, even after controlling for a range of borrower, bank, and regulatory mechanisms. Ideally, we would test whether an *exogenous* shift in nonbank credit causes banks to adjust their liquidity provision. In reality, credit changes seldom occur randomly. Therefore, we exploit the 2014–16 oil price shock—which sharply reduced nonbank lending capacity for reasons unrelated to most borrowers' fundamentals—as a plausibly exogenous shock to nonbank credit supply. This setting allows us to investigate banks' responses to reduced nonbank financing.

5.1 Background

Between mid-2014 and early 2016, global oil prices plunged by nearly 70% — one of the largest declines on record. The initial drop was driven by booming U.S. shale oil production—whose break-even prices had fallen drastically—together with shifting OPEC policies aimed at protecting market share. From June 2014 through January 2015, the price of West Texas Intermediate (WTI) crude slipped from $107.95 to $44.08, a 59% decline in just seven months (Figure 7, Panel A). By early 2015, continued weakening demand (especially in China and Europe) and a strengthening U.S. dollar deepened the downturn, pushing oil prices about 70% below their mid-2014 peak.[15]

This sharp collapse came faster and more severely than most market participants anticipated, creating a shock that was largely unrelated to the fundamentals of non-oil companies. Indeed, while energy sector stocks declined by roughly 9% in 2014, the broader equity market

[15]Since oil is predominantly priced in U.S. dollars, an appreciating dollar further dampens global demand.

(S&P 500) remained relatively stable through early 2016 (Figure 7, Panel B). In contrast, the leveraged loan market was severely affected: secondary market prices declined over 10% (Panel C), driven by a larger than 20% drop in oil and gas loans (Panel D). Collateralized loan obligations (CLOs)—major investors in institutional term loans (TLB)—were hit especially hard: new CLO issuance fell nearly 60% from mid-2014 to early 2016 (Figure 7, Panel A). Many of these CLOs held substantial exposures to oil and gas firms, prompting investors to avoid CLOs (and thereby the institutional loan tranches they purchase). Consequently, TLB originations shrank in the primary market (Panel B), whereas bank-provided term loans and credit lines remained comparatively stable or even rose slightly.

Because CLOs account for a large share of TLB financing, their retrenchment had direct consequences for nonbank-dependent borrowers—even outside the oil sector. For firms financed by CLO managers heavily exposed to energy assets, the abrupt contraction in institutional loan supply was effectively unanticipated and disconnected from their own operational performance. By limiting our analysis to non-oil borrowers, we focus on how the oil price shock filtered through CLO balance sheets rather than borrower-specific fundamentals. This unique episode, thus, offers a plausibly exogenous setting to assess how banks respond when nonbank credit dries up—shedding light on whether (and how) banks reduce liquidity provisions in anticipation of heightened rollover risk among nonbank-funded firms.[16]

5.2 Credit Outcomes for Nonbank Dependent Borrowers

Our primary interest is to determine how a plausibly exogenous reduction in nonbank lending affects bank liquidity provision. In particular, we exploit the sharp drop in new CLO issuance during the oil price shock as a shock to nonbank term loans (TLBs). Specifically, certain CLOs had higher pre-shock exposure to oil and gas (O&G) firms, saw a correspondingly larger fall in portfolio value, and thus curtailed new TLB originations more sharply. At

[16] Saunders et al. (2025) show in related work that the oil and gas shock is a supply shock to the nonbank sector that adversely effects secondary loan market prices of non-oil and gas firms and thereby reduces supply of lending by nonbank lenders for these firms also in primary loan markets.

the borrower level, some firms happened to have loans held by these heavily O&G-exposed CLOs, while others had loans placed with comparatively unaffected CLOs. This differential forms the basis of our identification: indirect exposure to the oil shock—via the CLOs that hold a firm's debt—alters the firm's reliance on nonbank financing for reasons exogenous to its own fundamentals.

5.2.1 Oil-gas Exposure

Our main variable of interest is the level of exposure to the oil price shock for each borrower. To measure this, we first calculate the share of each CLOs portfolio in oil and gas firms as of May 2014 (one month before the shock). Our sample has 687 CLOs with an average share of 3% of their portfolio in oil and gas firms.

To measure the exposure of each borrower to the shock, we calculate a weighted average of CLO-level oil-gas exposure with the weights based on the share of traded loans of the borrower held by each CLO.

5.2.2 CLO Fire Sales and Indirect Exposure

To illustrate how CLO behaviors diverged, Figure 8 shows the average sale prices of loans in CLO portfolios from January 2012 to December 2017. Panel A focuses on O&G firms; after mid-2014, loan prices fall well below par, with the drop being similar for CLOs with high or low O&G exposure, suggesting fundamental shock to oil and gas firms. What is interesting, however, is that in Panel B we see that the "high-exposure" CLO managers also discounted non-O&G firm loans more than low-exposure managers, possibly to meet liquidity or regulatory constraints.

Our empirical design excludes O&G borrowers outright, ensuring that any observed effects on a firm's funding derive only from indirect spillovers through CLO balance sheets, rather than the firm's own direct exposure to oil markets. Appendix Table A2 compares characteristics of firms with high and low oil-gas exposure in our sample.

5.2.3 Rollover Risk and Borrower Heterogeneity

Some borrowers may be especially susceptible to cutbacks in nonbank financing if they need to roll over debt during the shock. Accordingly, we split the sample between maturing and active TLBs. *Maturing TLBs* are nonbank loans outstanding as of 2014Q1 with at least one nonbank loan maturity falling between 2014Q2 and 2015Q4 (the oil shock window). *Active TLBs* remain outstanding through 2016Q1, implying no immediate refinancing pressure. This separation parallels prior evidence that maturing debt during a crisis directly worsens firm outcomes (Almeida et al. 2011). Firms with non-maturing TLBs experience a reduction in further accumulation of nonbank credit, but do not face imminent rollover demands.[17]

To verify that the *Maturing TLBs* classification is not just picking up borrowers that in general have shorter loan maturity, and hence may be riskier borrowers, we compare the maturity of term loans and credit lines for *Active TLB* and *Maturing TLB* borrowers before the oil price shock in Appendix Figure A5. Panel A plots the distribution of the maturity of TLBs for these borrowers while Panel B and C formally test the differences in their maturity structure. Panel B shows there is no significant difference in means, while Panel C suggests that the *Maturing TLB* group has slightly more observations in the left tail for TLB maturity, but more observations in the right tail for TLA and credit line maturity.

5.2.4 Descriptive exercise

We next verify that borrowers more exposed to the oil-driven CLO shock indeed lose access to nonbank loans, and then examine how they utilize and obtain bank credit lines. Formally, we estimate:

$$y_{i,t} = \alpha + \beta \text{High Oil-Gas Exposure}_i \times \mathbf{1}_t + \lambda_t + \delta_i + \epsilon_{i,t} \tag{2}$$

[17]For maturing TLB borrowers, the lack of new TLB issuance comes from lack of new CLO issuance (nearly all new loans are bought by new CLOs since exisiting CLOs cannot purchase new loans outside of their reinvestment period). If active and maturing TLB borrowers are otherwise similar, the fire sales should affect them both similarly, but the maturing TLB are, in addition, affected by lack of CLO issuance exacerbating the effect of the shock.

where $y_{i,t}$ is either the volume or spread of outstanding TLBs (nonbank) or credit lines (bank) for borrower i in quarter t. *High Oil-Gas Exposure* equals one if a firm's weighted CLO exposure to oil and gas (as of 2014Q1) is above the sample median. We include borrower fixed effects, rating fixed effects, and two-digit SIC industry fixed effects, clustering standard errors by borrower. We also split borrowers by *maturity* of their nonbank loans and *credit rating*.

Nonbank Term Loans. Panel A of Figure 9 shows that, for borrowers whose loans are held by highly O&G-exposed CLOs, the outstanding volume of TLBs flattens out and then declines significantly after 2014Q2, relative to its pre-shock trend. Even after overall issuance eventually recovers, these borrowers remain at persistently lower TLB levels—suggesting a "scarring" effect, whereby previously nonbank-dependent firms reduce their reliance on TLBs. This decline is most pronounced for Maturing TLB borrowers, who face imminent rollover during the shock window.

Panel B supports a *supply-driven* interpretation: TLB volume drops even as TLB spreads rise for these same borrowers. Firms with maturing TLBs are both less likely to obtain new nonbank loans and more likely to pay significantly higher spreads if they do. While borrower demand may also shift during turbulence, the simultaneous decline in quantity and increase in price is consistent with a contraction in nonbank credit supply linked to oil-exposed CLOs.

Bank Credit Lines. Turning to Panels C and D, we see differential effects on credit lines. Borrowers with Active TLBs (i.e., non-maturing) experience an uptick in credit line availability around the oil price shock (Panel C)—banks appear willing to step in, possibly anticipating these borrowers will not remain highly nonbank-reliant going forward. In contrast, Maturing TLB borrowers see a concurrent reduction in credit lines, suggesting that if a firm's nonbank debt must be refinanced mid-shock, banks are more reluctant to expand liquidity commitments.

Before the shock, the changes in credit lines for both groups hover near zero, reinforcing the view that the shock itself triggers the divergent paths. By the end of the sample,

Active TLB borrowers from high-exposure CLOs obtain significantly more bank credit lines, consistent with banks substituting for nonbank outflows. However, Maturing TLB borrowers do not see this benefit—likely reflecting heightened uncertainty or adverse selection around their refinancing needs.

Finally, we investigate changes in the pricing of outstanding and newly issued credit lines (Figure 9, Panel D). Before 2014Q1, the spreads that borrowers in highly O&G-exposed CLOs paid were statistically indistinguishable from those paid by less-exposed borrowers. After the shock, however, outcomes diverge. Among Active TLB borrowers—who do not face immediate rollover pressure—credit line spreads gradually fall, consistent with banks recognizing (and pricing in) the borrower's reduced nonbank reliance. By contrast, Maturing TLB borrowers see a rise in spreads, suggesting that forced refinancing of nonbank loans around the shock leads banks to charge more for liquidity commitments.

Overall, the evidence shows that (i) nonbank-financed borrowers who must refinance mid-shock experience persistent reductions in TLB usage and more expensive credit lines, while (ii) those without imminent maturities receive more favorable bank terms, apparently reflecting banks' willingness to lend once nonbank dependence subsides.

5.2.5 Empirical tests: Maturing vs. non-maturing loans

Table 8 quantifies how the oil-driven contraction in nonbank supply affects both nonbank term loans (Panel A) and bank credit lines (Panel B). We estimate:

$$y_{i,t} = \alpha + \beta \text{Oil-Gas Exposure}_i \times \text{Post}_t \times \text{Rollover Risk}_i + \lambda_t + \delta_i + \epsilon_{i,t} \tag{3}$$

where $y_{i,t}$ is the volume or spread of newly issued term loans or credit lines for borrower i in period t. *Post* is 1 for quarters after 2014Q1, and *Oil-Gas exposure* is the standardized measure of a borrower's indirect exposure, based on oil and gas loan investments of CLOs holding its TLBs (as of 2014Q1). $RolloverRisk_i$ flags whether the firm's TLB must mature

during the shock window (the Maturing vs. Active TLB sample). All regressions include borrower, industry, rating, and year-quarter fixed effects, with standard errors clustered at the borrower level.

Term Loan Volume and Spreads. Column (1) of Table 8 show that borrowers with maturing nonbank loans in CLOs more exposed to the oil shock (i.e., one standard deviation above the mean) experience a significant drop in new TLB issuance—on average 10.8 percentage points lower relative to less-exposed firms. Correspondingly, in Column (2), these borrowers face a 9.7 bps increase in their weighted-average TLB spreads. The fact that TLB quantity falls while prices rise aligns with a negative supply shock in nonbank lending relative to borrowers whose TLBs are not maturing, or whose CLO exposure is mild.

Similarly, Columns (3) and (4) show that borrowers with maturing nonbank loans in CLOs more exposed to the oil shock experience a drop in new bank term loan origination (TLA) - with volume reducing by 7.8 ppts and spreads increasing by 16.7 bps relative to less exposed firms. Overall, Column (5) suggests that total term loan issuance volume drops by 16.3 ppt for high exposure borrowers, leading to an increase in their nonbank dependence (Column 6)

Bank Credit Lines. Columns (7) and (8) of Panel B indicate that the same high-exposure borrowers with maturing TLBs who saw a concurrent increase in nonbank dependence also suffer reduced credit line issuance —7.4 ppt on average, rising to 10 ppt for those with imminent TLB rollover. Meanwhile, these distressed borrowers pay higher spreads on whatever credit lines that they do secure.

Together, these patterns reinforce our earlier narrative: if a firm's nonbank loans must be refinanced mid-shock, banks appear reluctant to provide offsetting credit lines, and do so only at a premium.

Robustness. To address the concern than borrowers may be able to shift to bonds, or that their rollover risk could be stemming from the bond market rather than the loan market, in Panel C, we focus on a set of borrowers that do not have access to public bond

markets and find qualitatively similar results.

In Panel D, we restrict our sample to borrowers that had both bank and nonbank term loans outstanding as of 2014Q1. This helps address the concern that the observed decline in bank term loan and credit line lending is due to lack of bank relationships for these borrowers. By narrowing down on the set of borrowers that had a pre-existing relationship with banks, we still see that the rollover risk stemming from nonbanks leads to banks reducing their credit supply.

Addressing Other Changes (Leveraged Lending Guidelines). One concern is that the Federal Reserve's 2013 leveraged lending guidelines, which constrain large banks' ability to lend to highly levered firms, might be driving the observed credit-line patterns. If firms in high oil-gas-exposure CLOs were also systematically riskier, they could be disproportionately affected by these guidelines rather than by a genuine nonbank supply shock.

However, Appendix Table A2 suggests that while high-exposure borrowers differ in some pre-shock characteristics (e.g., leverage, cash holdings, credit ratings), the effect we document persists even after controlling for borrower-level risk. Moreover, Appendix Table A3 splits the sample by banks under "Large Institution Supervision Coordinating Committee" (LISCC) supervision (versus other banks), confirming that our main findings hold within each group over time.[18] This consistency implies that the decline in credit lines for highly exposed, maturing borrowers is not simply a byproduct of regulators tightening leverage rules for specific large banks.

In sum, the regression results confirm that when nonbank lenders retrench due to oil-driven CLO losses, firms with maturing TLBs face both sharply lower nonbank loan availability and less compensating credit from banks—unless they pay a higher spread.

[18]Currently, 8 U.S. banks are included in the program - Bank of America Corporation, The Bank of New York Mellon Corporation, Citigroup Inc., The Goldman Sachs Group, Inc., JP Morgan Chase & Co., Morgan Stanley, State Street Corporation, Wells Fargo & Company

5.3 Financial and Real Effects on Nonbank Dependent Borrowers

5.3.1 Credit Line Drawdowns and alternative funding sources

A key question is whether borrowers draw on their existing credit lines when nonbank funding (and potentially new bank credit) becomes scarce. Figure 10 shows that in prior stress episodes, credit line usage rises most sharply among borrowers heavily reliant on nonbanks. Consistent with this, Column 1 of Table 9 reveals that firms facing greater rollover risk through maturing nonbank loans are the ones that increase their credit line drawdowns the most. Hence, even though these firms struggle to secure new credit lines post-shock, they do tap existing lines to mitigate the nonbank financing shortfall.

5.3.2 Borrower Outcomes

Lastly, we examine how these liquidity constraints shape borrowers' financial and real outcomes. If a firm's nonbank funding contracts but it does not have to refinance immediately (i.e., no maturing TLB), then banks anticipate lower future nonbank dependence and offer more credit. By contrast, maturing TLB firms—especially those deemed riskier—remain more constrained and see less overall liquidity.

Using equation (3), we replace credit variables with firm-level outcomes in Table 9. The results indicate that those with greater exposure to oil-gas CLOs and fewer new credit lines ultimately fare worse during the shock. The increased drawdown in credit lines is not accompanied by an increase in cash holdings (Column 2). At the same time, their assets (Column 3) and capital decline (Column 4). This suggests that even constrained firms prioritize retaining some cash as rollover pressure intensifies. While they draw down some existing liquidity, it is insufficient to offset the broader tightening. In unreported results, we observe an economically but not statistically significant drop in stock returns.

Overall, these findings reinforce that nonbank-dependent borrowers with immediate rollover needs bear the brunt of a negative supply shock, experiencing weaker balance-sheet outcomes

and fewer alternatives for replacement credit.

6 Conclusion

This paper shows that the rise of nonbank financing—while expanding credit access—can subject borrowers to heightened rollover risk and liquidity pressures. Our evidence indicates that firms relying more heavily on nonbanks secure fewer and more expensive bank credit lines. In market-wide stress, these firms face a "double whammy": not only do nonbanks withdraw funding, but banks also limit liquidity insurance if they anticipate large future drawdowns.

Using an exogenous CLO-driven contraction in term loans during the 2014–2016 oil price shock, we find that firms without imminent rollover needs reduce their nonbank dependence and receive expanded credit lines at lower spreads—ultimately improving balance-sheet outcomes. By contrast, borrowers forced to refinance mid-shock experience both curtailed TLB funding and higher-priced or smaller bank lines, with real effects on investment, capital, and overall financial health.

Future work could examine whether constrained firms significantly alter their operational decisions (e.g., R&D or employment) in response to reduced nonbank funding. Moreover, given the global expansion of nonbank lending, exploring how regulatory frameworks or bank–nonbank institutional arrangements differ across jurisdictions could yield valuable insights. Also, investigating how various central bank facilities (e.g., discount windows, repo programs) affect the interplay between banks and nonbanks in stress episodes remains largely unexplored. We leave these questions for future research.

Our paper also has interesting policy implications. The shifting of credit from nonbanks to banks during crises highlights potential systemic spillovers. Nonbanks lack deposit insurance and central bank backstops, so sudden outflows can amplify volatility. Policymakers may consider coordination or expanded oversight to mitigate destabilizing drawdowns. Greater

disclosure of nonbank exposures—such as CLO portfolios—could reduce uncertainty when shocks hit a specific sector (e.g., oil and gas) and improve market discipline. Finally, banks' reluctance to extend credit lines for highly nonbank-dependent firms suggests a need for more robust risk assessments and dynamic capital regulation that considers off-balance-sheet commitments.

Overall, while nonbank financing has become an important part of corporate funding, our findings show that reliance on nonbanks heightens firms' vulnerability to systemic shocks. Banks, in turn, provide only partial relief under these conditions, especially for riskier or rollover-constrained borrowers. Recognizing and managing this fragility is essential to sustaining corporate credit flows and financial stability in an era of expanding shadow banking.

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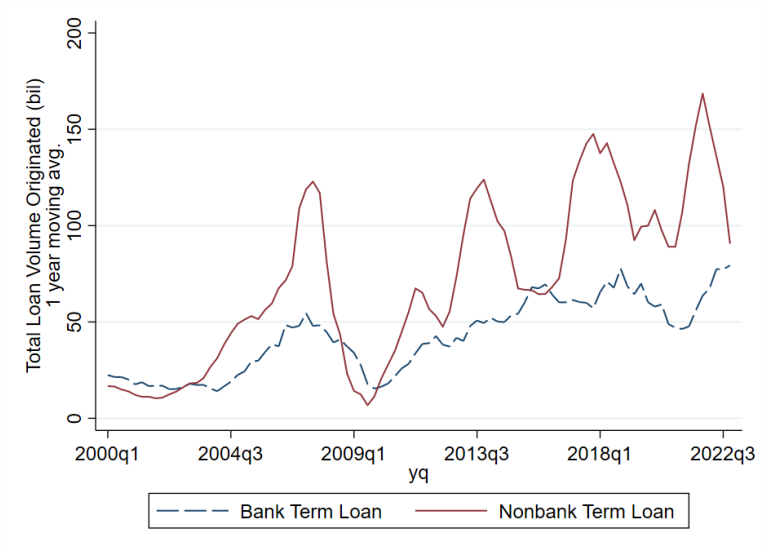
Figure 1: Growth of Nonbank Lending

Panel A plots the quaterly origination volume of bank and nonbank term loans in billions of dollars. Panel B plots the quarterly total book value of assets of bank and nonbank borrowers in trillions of dollars. The sample spans the 2000 to 2022. period Loan origination data is from Dealscan, borrower asset size is from Compustat. Term Loan As are classified as *Bank Term Loan*. Term Loan B-Ks are classified as *Nonbank Term Loans*. *Nonbank Term Loan borrowers* are borrowers that have at least one nonbank term loan outstanding in a given quarter. All other borrowers are classified as *Bank Term Loan Borrowers*.

Panel A - Loan Volume by Loan Type



Panel B - Total Assets of Bank and Nonbank Term Loan Borrowers

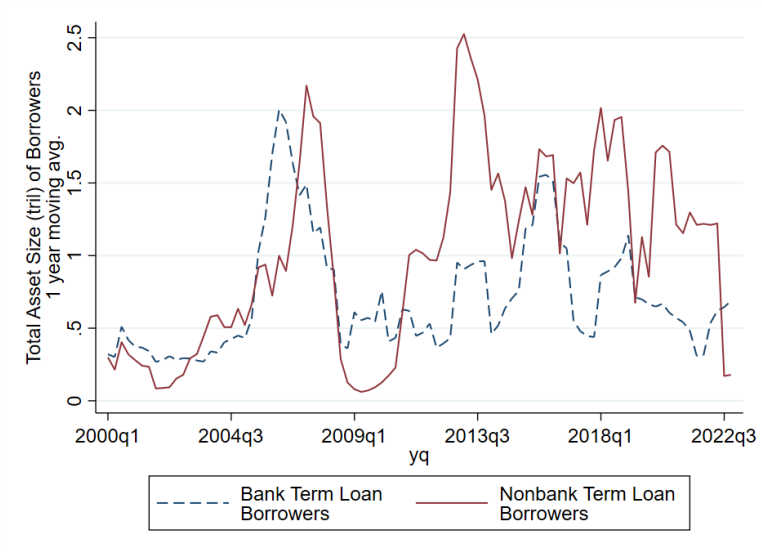


Figure 2: Credit Line Drawdowns - COVID-19

This figure plots the weighted average cumulative daily credit line utilization rate of bank and nonbank borrowers during COVID-19. The sample period is from March 1, 2020 to June 20,2020. Borrowers are classified as bank borrowers if they have no nonbank loan outstanding as of February 2020. For each day, we calculate the cumulative borrowing as the total credit line drawdown from March 1, 2020 upto the date. Credit line utilization is the cumulative borrowing scaled by the size of the total credit lines commitment to the borrower. We then calculate the average for each group as the weighted average utilization of borrowers in that group (weighted by each borrower's total credit line commitment). Credit line drawdowns and commitments are from S&P's Leverage Commentary & Data (LCD).

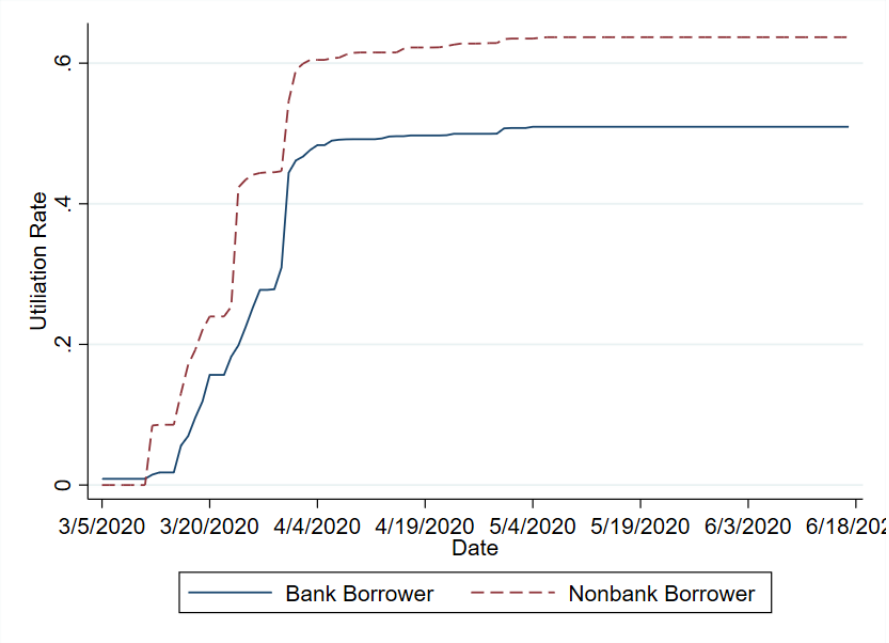
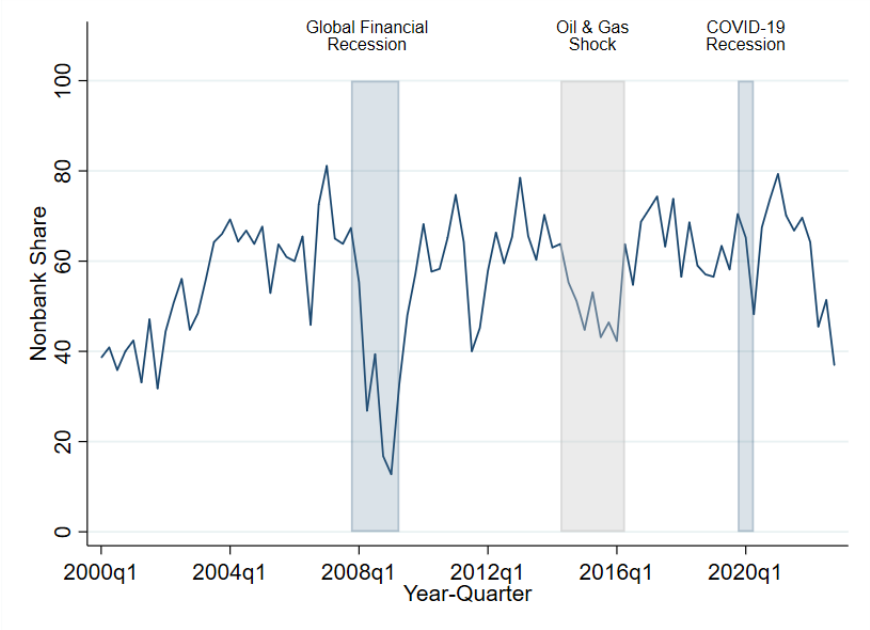


Figure 3: Nonbank Dependence

This figure plots our measure of Nonbank Share and Nonbank Dependence (defined as nonbank term loans divided by total term loans) over the 2000 to 2022 period. Shaded areas either define NBER recession periods or the oil & gas crisis. Data are from S&P's Leverage Commentary & Data (LCD).

Panel A - Nonbank Share based on DealScan originations



Panel B - Nonbank Dependence based on oustanding loans

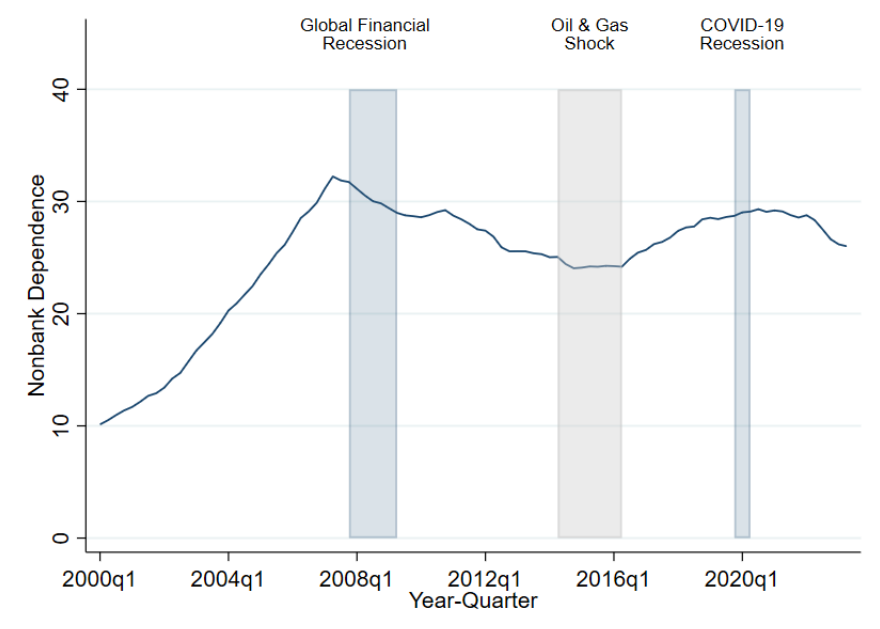
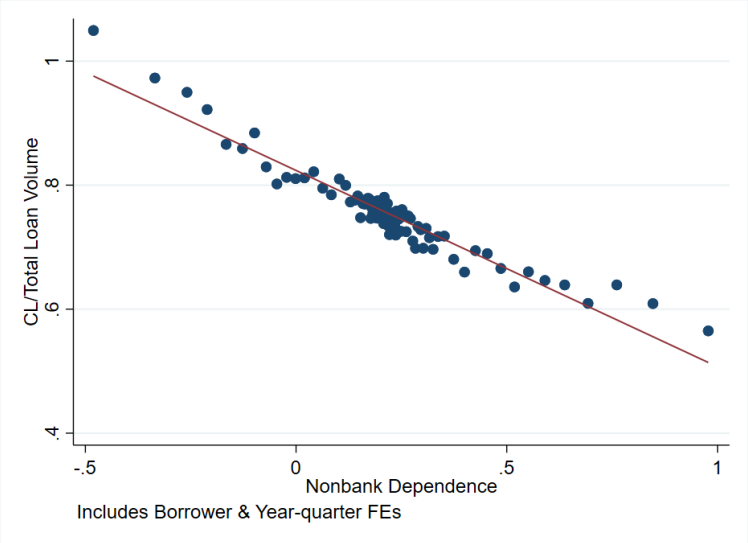


Figure 4: Volume of Credit Lines vs. Nonbank Dependence

This figure presents the binscatter plot of credit line access against nonbank dependence of the borrower. Data is at the borrower-year-quarter level and the sample period is 2000Q1-2022Q4. In Panel A, we measure credit line outstanding as a share of total loans outstanding to the borrower. In Panel B, we measure credit lines outstanding as a share of total liquidity (measured by cash plus credit lines). *Nonbank Dependence* is a measure of nonbank exposure of the borrower based on the volume of nonbank term loans (Term Loan B-K) outstanding as a share of total term loans outstanding in the current quarter for the borrower. We plot the residuals of the dependent and explanatory variables after controlling for borrower and year-quarter fixed effects.

Panel A - Credit Line Share of Total Lending



Panel B - Credit Line Share of Total Liquidity

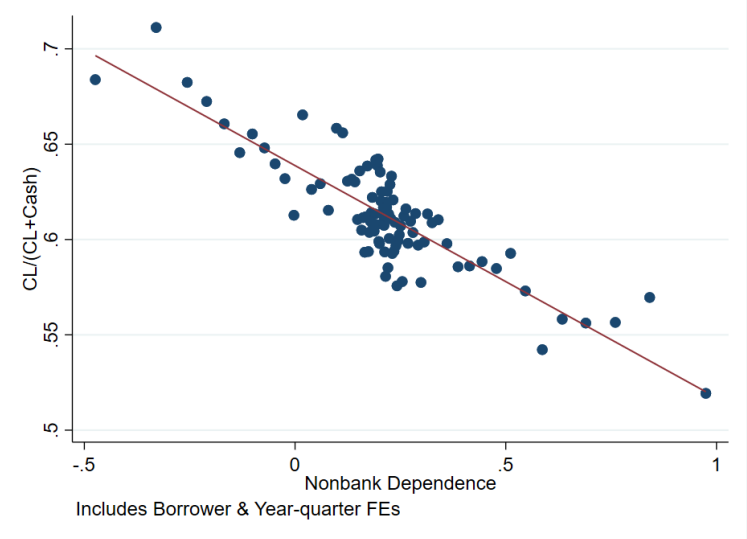
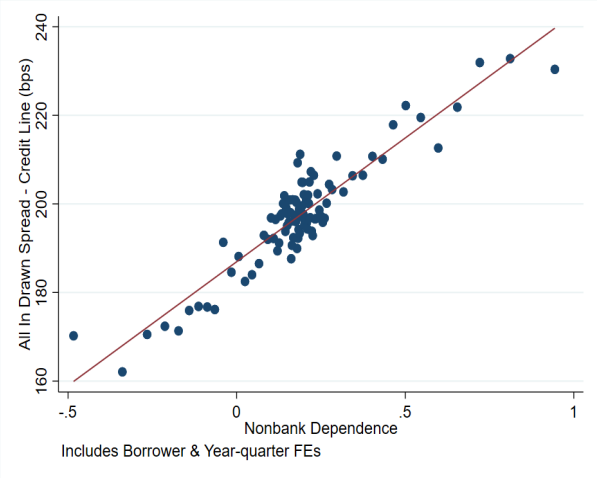
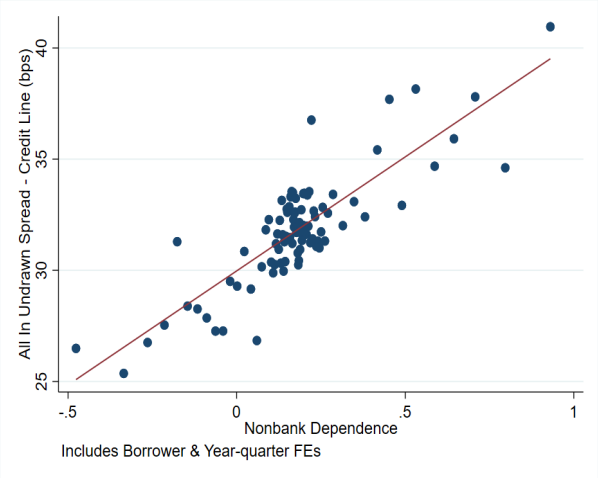


Figure 5: Cost of Credit Lines vs. Nonbank Dependence

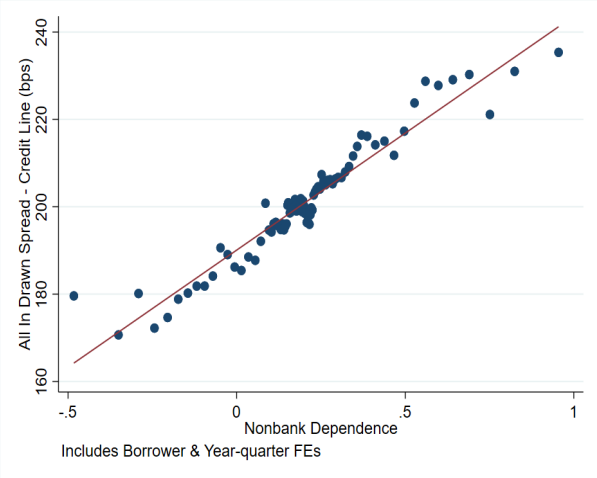
This figure presents the binscatter plot of the cost of credit lines against nonbank dependence of the borrower. Data is at the borrower-year-quarter level and the sample period is 2000Q1-2022Q4. In Panel A, we measure the all-in-drawn and all-in-undrawn spreads of newly issued credit lines in the given quarter. In Panel B, we measure the all-in-drawn and all-in-undrawn spreads based on the weighted average of credit lines outstanding in the given quarter (weighted by loan amount). *Nonbank Dependence* is a measure of nonbank exposure of the borrower based on the volume of nonbank term loans (Term Loan B-K) outstanding as a share of total term loans outstanding in the current quarter for the borrower. We plot the residuals of the dependent and explanatory variables after controlling for borrower and year-quarter fixed effects.

Panel A - Cost of New Credit Lines





Panel B - Average Cost of Outstanding Credit Lines



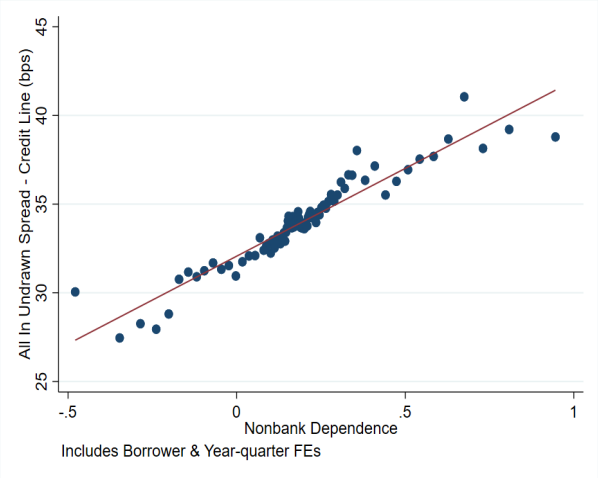
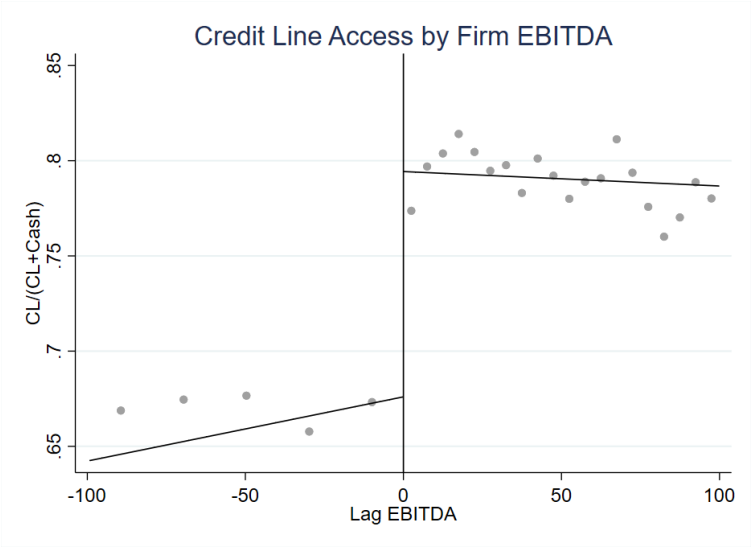


Figure 6: Access to Bank Loans Based on Firm EBITDA

This figure presents regression discontinutity plots of bank credit access based on firm EBITDA. The zero EBITDA cut-off is the conventional limit below which banks are prohibited from making loans to firms. Panel A presents results on extension of credit lines measured as new credit lines issued as a share of total liquidity (cash plus credit lines). Panel B presents results on extension of bank term loans as a share of total term loans of the borrower. *Lag EBITDA* is the firm's EBITDA one quarter before the loan is originated.

Panel A - Bank Liquidity Provision



Panel B - Bank Term Loan Share

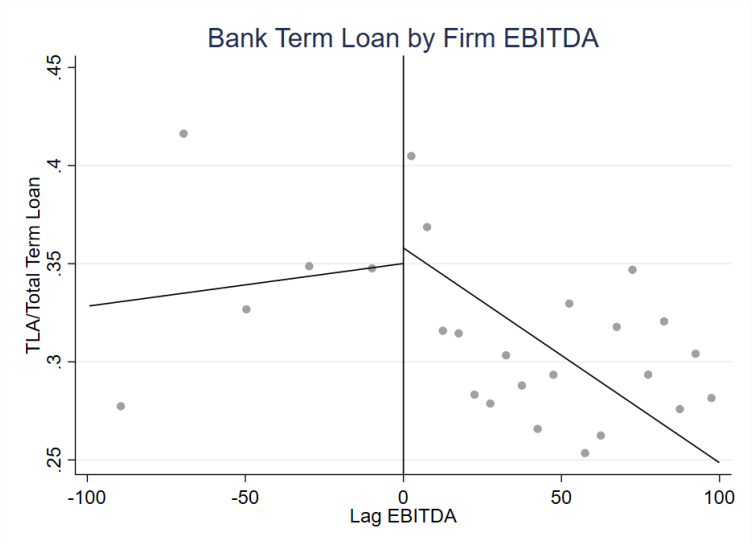
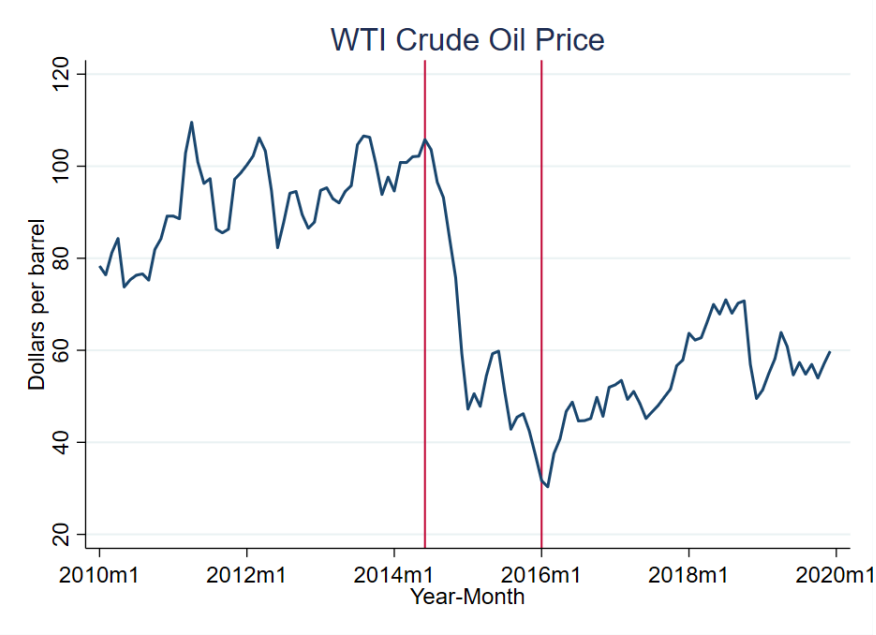


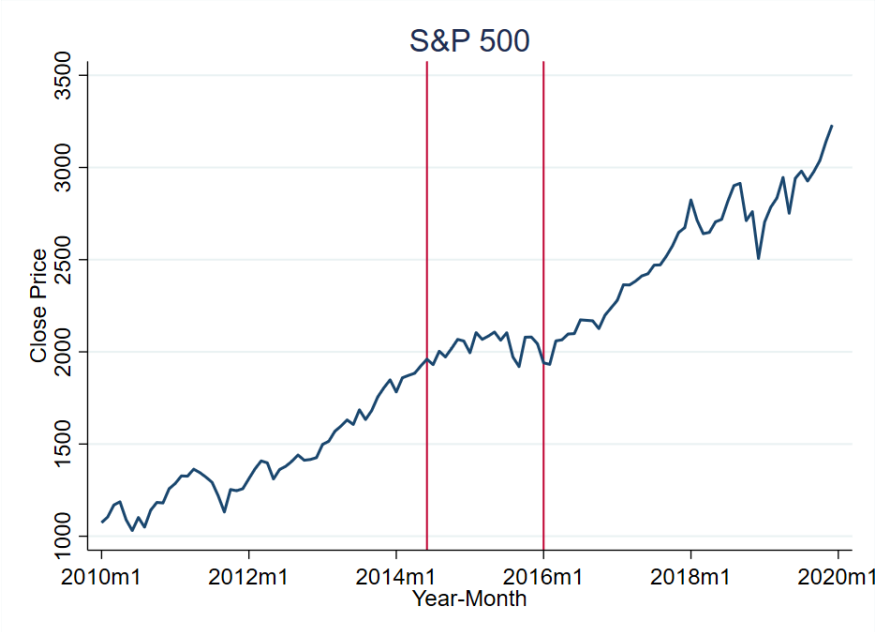
Figure 7: Price Movements during the 2014-16 Oil Price Shock

Panel A presents the level of oil prices of the West Texas Intermediate (WTI) and Panel B plots the S&P500 values from 2010 to 2020 .Panel C and Panel D shows the average quote on the leveraged loan market as reported by the Loan Syndications and Trading Association (LSTA) from 2010 to 2017. Panel D plots the secondary market loan prices from LSTA for oil and gas sector firms and all other firms separately. The two vertical bars mark June 2014 and January 2016 - the start and end of the drop in oil prices during the 2014-16 oil price shock.

Panel A - Oil Price

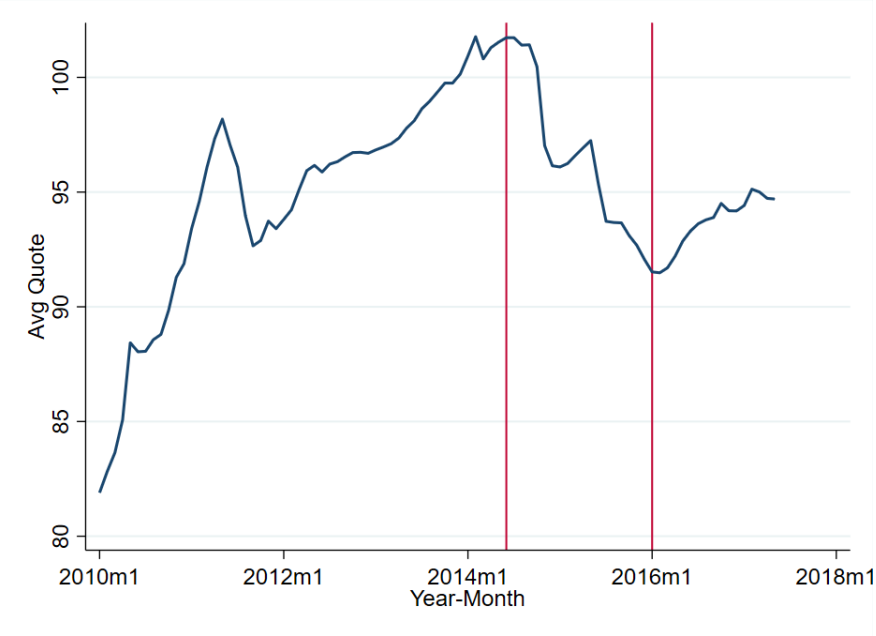


Panel B - Stock Price



Price Movements - Continued

Panel C - Loan Prices - All Loans



Panel D - Loan Prices - Oil and Gas vs. Other Industries

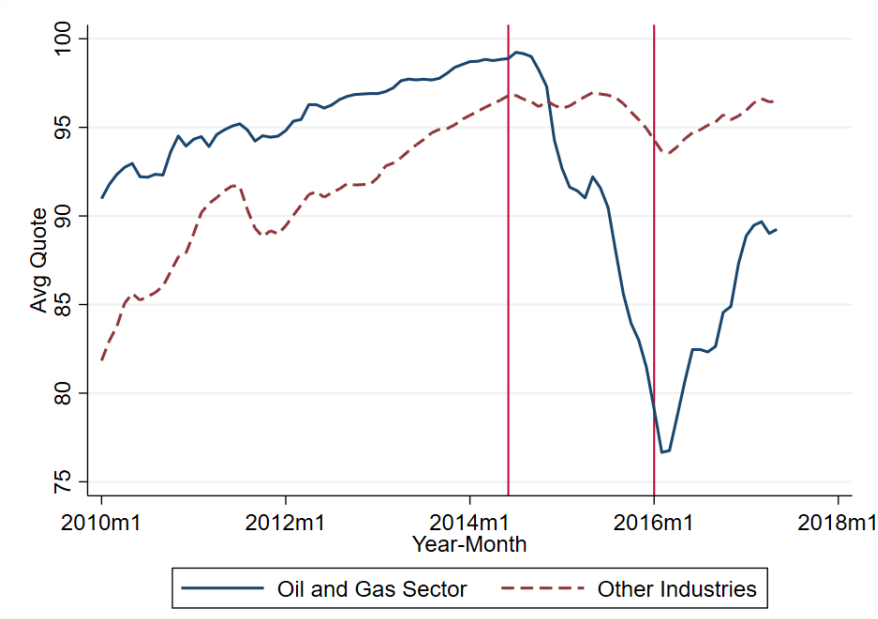
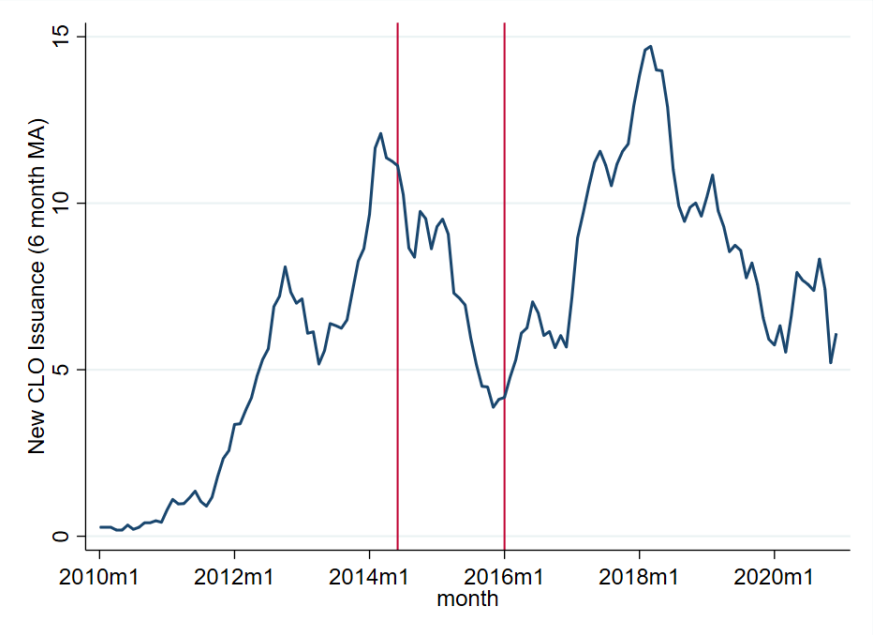


Figure 7: New CLO Issuance and Loan Originations

This figure plots new CLO issuance from Creditflux (Panel A) and new syndicated loan originations in DealScan (Panel B) between 2010 and 2020. The two vertical bars mark June 2014 and January 2016 the start and end of the drop in oil prices during the 2014-16 oil price shock.

Panel A - CLO Issuance Data - Creditflux; 6 month moving average



Panel B - DealScan originations

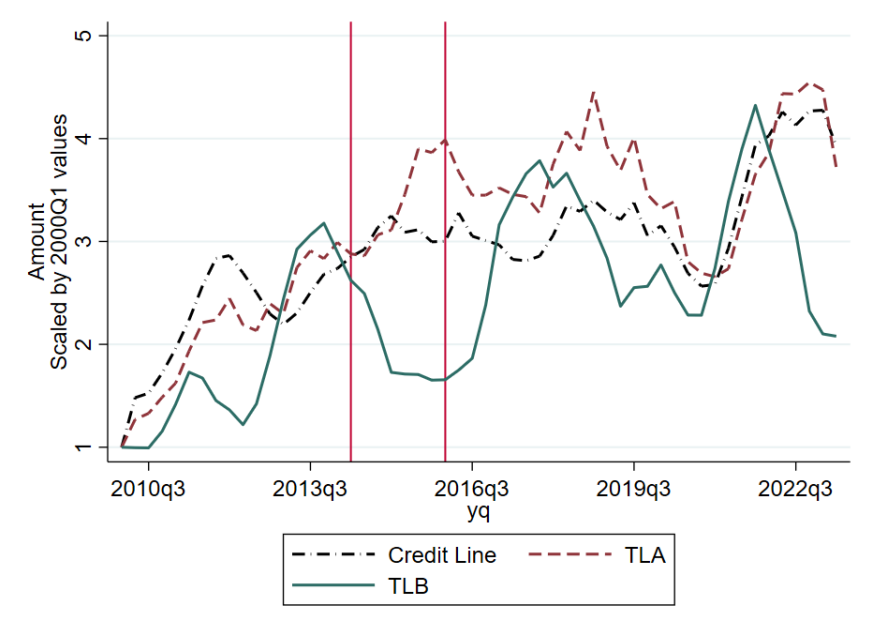
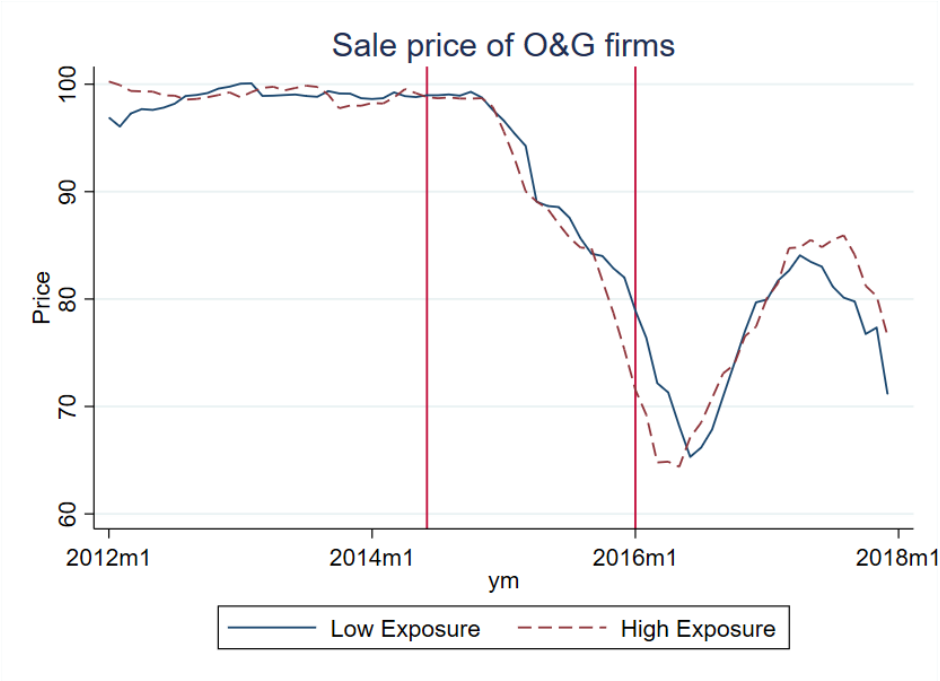


Figure 8: Oil Shock Exposure - Impact on CLOs

This figure plots the sale price of firms in the oil and gas sector (Panel A) and others (Panel B) between 2012 and 2017. The two vertical bars mark June 2014 and January 2016 the start and end of the drop in oil prices during the 2014-16 oil price shock.

Panel A - Sale Price



Panel B - Non - O&G firm sales

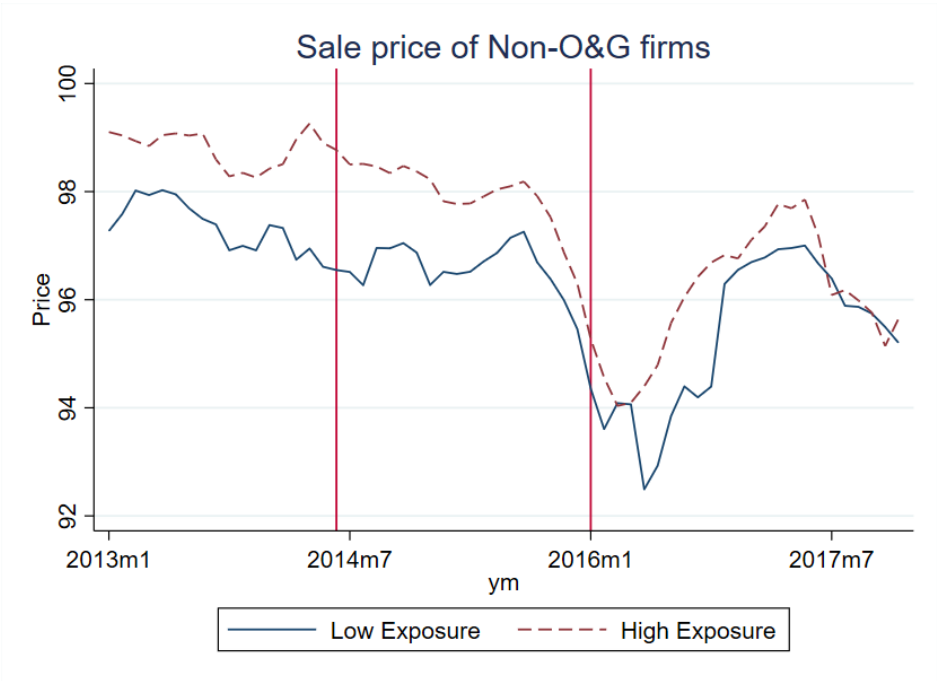


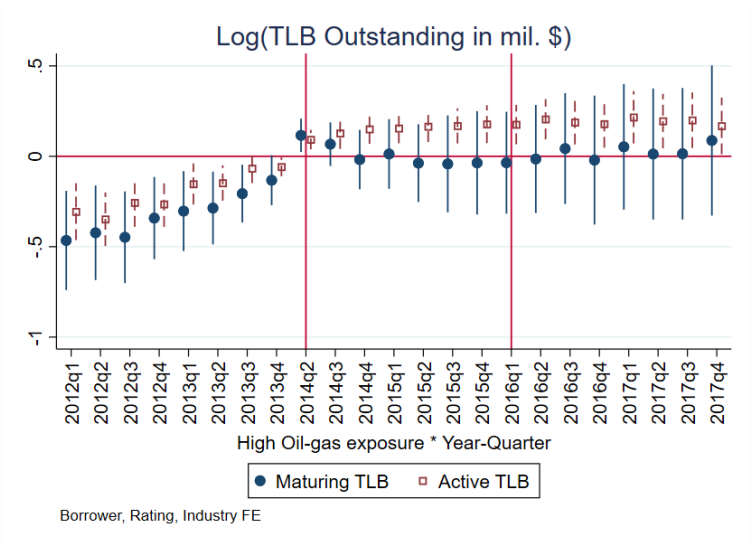
Figure 9: Borrower Term Loan and Credit Line Access Based on Loan Maturity

This figure plots the coefficients from the following regression around the oil price shock

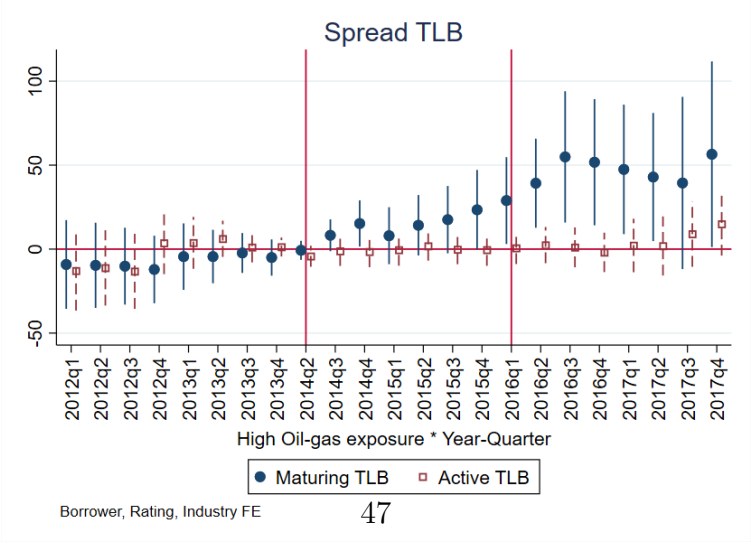
$$y_{i,t} = \alpha + \beta \text{High Oil-Gas Exposure}_i \times \mathbf{1}_t + \lambda_t + \delta_i + \epsilon_{i,t}$$

where $y_{i,t}$ is the volume of nonbank loans (Panel A), spreads on nonbank loans (Panel B), volume of credit lines outstanding (Panel C) and spreads on credit lines (Panel D) for each borrower i in quarter t. *High Oil-Gas Exposure* takes a value of one for firms with above median oil gas exposure. The *Oil-Gas Exposure* is the weighted average of a CLO's portfolio share in oil and gas firms with the weights corresponding to the share of the borrower's loans held by each CLO prior to 2014 Q1. Firms are classified as being *Active TLB* if they have an outstanding Term Loan B-K (TLB) as of 2014Q1 and their TLBs are not maturing during the oil price shock of 2014Q2-2016Q1. Coefficients plotted are relative to 2014Q1 (the quarter before the oil price shock). We include borrower fixed effects, rating × year-quarter fixed effects, and 2 digit SIC code × year-quarter fixed effects. Standard errors are clustered at the borrower level and bars denote 90% confidence intervals.

Panel A -TLB Outstanding

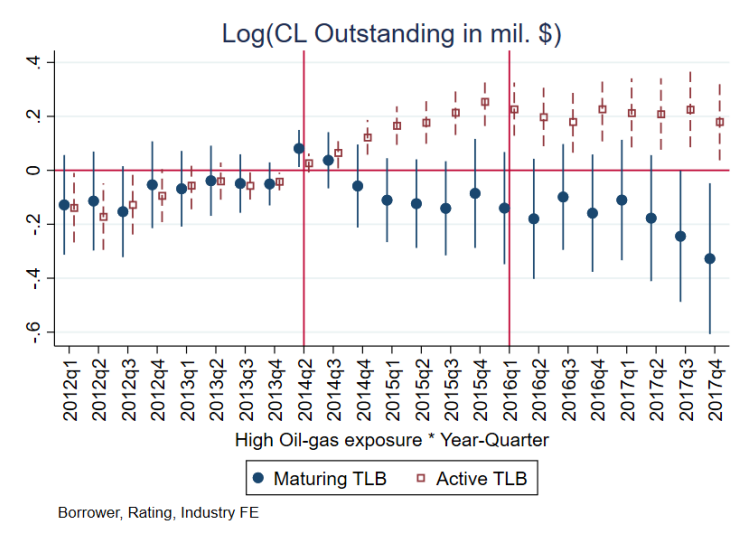


Panel B - TLB Spreads



Borrower Term Loan and Credit Line Access - continued

Panel C - Credit Line Outstanding



Panel D - Credit Line Spreads

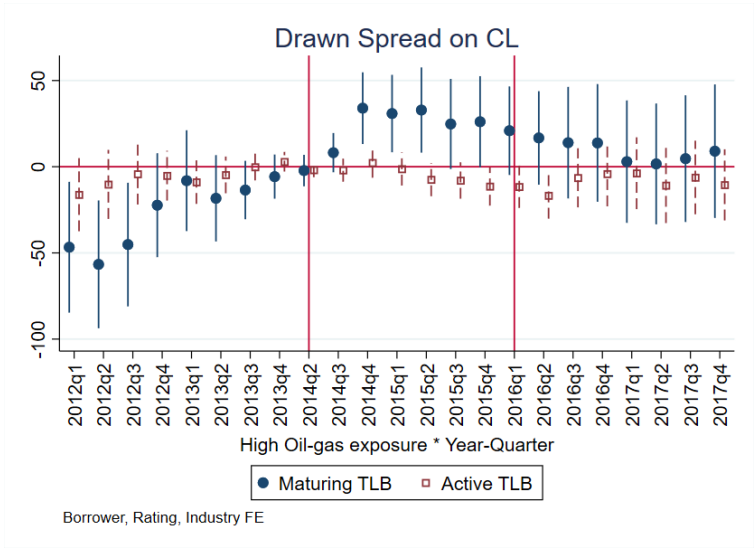
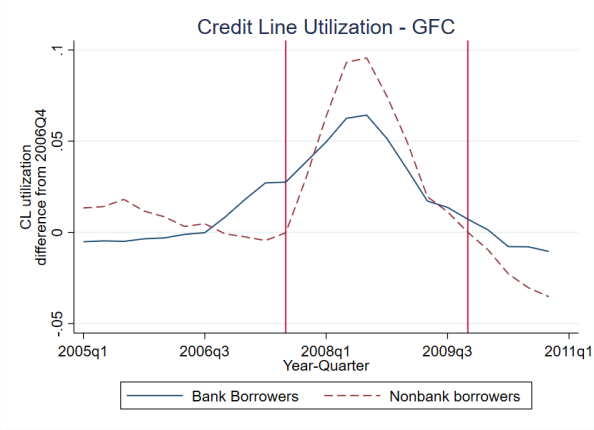


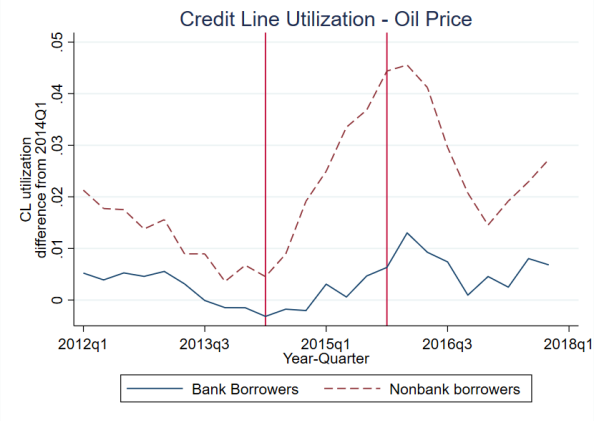
Figure 10: Borrower Credit Line Drawdown During Market Stress

This figure shows the average credit line utilization rate of bank and nonbank borrowers during the Global Financial Crisis (Panel A), oil price shock (Panel B), and COVID-19 (Panel C).Firms are classified as being *Nonbank Borrowers* if they have an outstanding Term Loan B-K (TLB) as of the quarter before the shock.

Panel A - Global Financial Crisis



Panel B - Oil Price Shock



Panel C - COVID-19

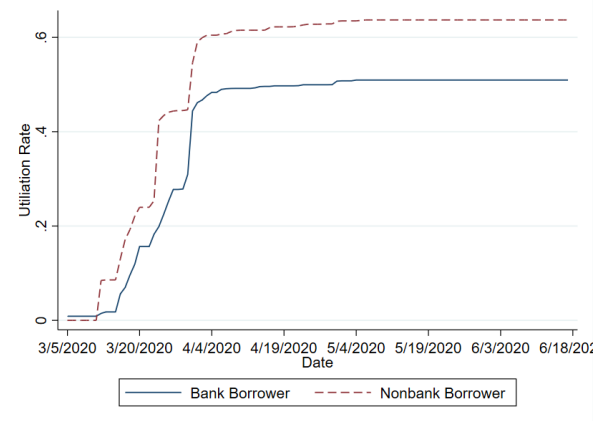


Table 1: Credit Line Drawdowns

This table presents results on credit line drawdowns during COVID-19. Data is at the borrower-level. Sample is based on drawdowns between March 1, 2020 and June 20, 2020. *Drawdown >0* takes a value of one if the firm drawsdown on its credit line during the sample period. *Utilization* is the increase total credit lines drawndown to total credit line commitment during the sample period. *Nonbank Dependence* is the share of term loans outstanding to a borrower from nonbanks as of 2019 Q4. Borrower conrtrols include the contemporaneous log of asset size, cash-to-asset ratio, and book leverage. Heteroskedastic robust standard errors are reported in parentheses below the coefficients. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

	Drawdown>0	Utilization		
	(1)	(2)	(3)	(4)
Nonbank Dependence	0.079***	0.044***	0.056***	0.102*
	(0.009)	(0.006)	(0.012)	(0.055)
Conditional on drawdown	N	N	N	Y
Borrower Controls	N	N	Y	Y
Obs.	4,705	4,705	1,550	206
R^2	0.021	0.019	0.020	0.047

Table 2: Correlation between different measures of nonbank dependence

This table presents the correlation between our measure of nonbank dependence and potential alternate ways to measure nonbank dependence. We present correlation between three different measures - classifying unclassified term loans as TLAs, classifying unclassified term loans as TLBs, or using the pro-rata definition to classify the unclassified term loans.

Panel A - Borrower-quarter level

	TL=TLA	TL=TLB	TL based on pro-rata
TL=TLA	1		
TL=TLB	0.552	1	
TL based on pro-rata	0.962	0.568	1

Panel B - Quarterly level

	TL=TLA	TL=TLB	TL based on pro-rata
TL=TLA	1		
TL=TLB	0.596	1	
TL based on pro-rata	0.999	0.590	1

Table 3: Summary Statistics

This table presents the summary statistics for borrowers with syndicated loans that can be matched to Compustat financial information. The panel is at the borrower-year-quarter level. Panel A presents results for all borrowers. Panel B presents results separately for bank and nonbank borrowers. A borrowers is classified as a nonbank borrower if it has any nonbank term loans (Term Loans B-K) outstanding in the given quarter. A borrowers with only bank loans (Term Loan A or credit line) is classified as a bank borrower. *Nonbank Dependence* is the share of term loans to the borrower from nonbanks. *Assets* are the average firm asset size from Compustat. *Credit Line >0* takes a value of one if the firm has a credit line outstanding in the given quarter else it takes a value of zero. *Cash/Assets* is the amount of cash and cash equivalents at the firm scaled by firm assets. *Total Debt/Equity* is total firm debt to shareholders equity. *Total Debt/Assets* is total firm debt to assets. *Credit Line/Total Loans* is the amount of credit line outstanding as a share of total loans to the borrower. *Credit Line/(Credit Line+Cash)* is the amount of credit line outstanding as a share of total cash and credit lines outstanding to the borrower. *Drawn Spread - CL* and *Undrawn Spread - CL* are the average all-in-drawn-spread and all-in-undrawn-spread on credit lines outstanding to the borrower. *Drawn Credit Line* is the average volume of credit line drawndown by the firm in millions of dollars. *Credit Line Commitment* is the total volume of credit line available to the firm in millions of dollars. *Credit Line Utilization* is the average volume of credit line drawdown as a share of total credit line balance.

Panel A - All Borrowers

	Mean	Std. Dev
Nonbank Dependence	0.24	0.39
Assets ($ bil.)	8.93	62.90
Total Debt/Assets	0.62	0.29
Cash/Assets	0.10	0.13
Share unrated firms	0.56	0.50
Credit Line >0	0.95	0.21
Credit Line/Total Loans	0.75	0.33
Credit Line/(Credit Line + Cash)	0.67	0.33
Drawn Spread - CL (bps)	186.69	109.08
Undrawn Spread - CL (bps)	31.77	22.06
Drawn credit line ($ mil.)	94.20	225.34
Credit line commitment ($ mil.)	639.08	1,060.94
Credit line utilization	0.21	0.28
Observations	192041	

Summary Statistics - continued

Panel B - Comparing Bank and Nonbank Borrowers

	Bank Borrower		Nonbank Borrower		Difference
	Mean	Std. Dev.	Mean	Std. Dev.	Mean
Nonbank Dependence	0.00	0.00	0.79	0.25	-0.79***
Assets ($ bil.)	7.71	37.35	12.71	109.23	-5.00***
Total Debt/Assets	0.58	0.27	0.75	0.32	-0.18***
Cash/Assets	0.10	0.14	0.08	0.10	0.02***
Share unrated firms	0.61	0.49	0.40	0.49	0.20***
Credit Line >0	0.96	0.19	0.92	0.26	0.04***
Credit Line/Total Loans	0.87	0.26	0.38	0.26	0.48***
Credit Line/(Credit Line + Cash)	0.68	0.32	0.63	0.37	0.05***
Drawn Spread - CL (bps)	167.64	102.68	245.15	107.35	-77.51***
Undrawn Spread - CL (bps)	27.84	20.74	43.61	21.70	-15.77***
Drawn credit line ($ mil.)	92.31	214.77	99.62	253.08	-7.31***
Credit line commitment ($ mil.)	672.34	1083.97	541.39	983.73	130.95***
Credit line utilization	0.22	0.28	0.19	0.27	0.03***
Observations	144453		47588		192041

Table 4: Effect of Nonbank Dependence on Credit Line Access

This table presents the results on how credit line access varies with nonbank dependence of the borrower. Data is at the borrower-year-quarter level and the sample period is 2000Q1-2022Q4. In Panel A, we measure credit line shares at issuance. Columns 1 to 4 measure credit line as a share of total loans to the borrower. Columns 5-8 measure credit lines as a share of total liquidity (measured by cash plus credit lines). In Panel B, we measure credit line spreads in basis points. Columns 1 to 4 present results for all-in-drawn-spread while Columns 5-8 present results for the all-in-undrawn-spread. *Nonbank Dependence* is a measure of nonbank exposure of the borrower based on the volume of nonbank term loans (Term Loan B-K) outstanding as a share of total term loans outstanding in the given quarter for the borrower. We include borrower, borrower rating × year-quarter fixed effects, 2-digit SIC code × year-quarter fixed effects, and controls for firm size, debt-to-asset ratio, loan maturity and deal purpose. Standard errors are clustered at the borrower level and reported in parentheses below the coefficients. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - Credit Line Shares

	CL/Total Loans at Issuance				CL/(CL+Cash) at Issuance			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Nonbank Dependence	−0.251***	−0.248***	−0.178***	−0.176***	−0.057***	−0.054***	−0.028***	−0.035***
	(0.014)	(0.012)	(0.014)	(0.016)	(0.010)	(0.010)	(0.009)	(0.010)
Rating x Year-Quarter FE	N	Y	Y	Y	N	Y	Y	Y
Borrower FE	N	N	Y	Y	N	N	Y	Y
Industry x Year-Quarter FE	N	N	N	Y	N	N	N	Y
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Unconditional mean	0.72	0.72	0.71	0.71	0.65	0.65	0.65	0.65
Obs.	26,021	25,951	24,706	23,517	26,017	25,947	24,704	23,514
R^2	0.052	0.077	0.473	0.537	0.103	0.152	0.663	0.729

Panel B - Credit Line and Term Loan Costs

	Credit Line					TLA	TLB
	(1) AISD	(2) AISU	(3) Upfront fee	(4) Commitment fee	(5) TCB	(6) AISD	(7) AISD
Nonbank Dependence	48.493***	7.572***	1.900	1.240	8.111**	150.065***	−39.565
	(4.510)	(1.288)	(1.242)	(1.101)	(4.109)	(24.017)	(26.709)
Rating x Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y
Borrower FE	Y	Y	Y	Y	Y	Y	Y
Industry x Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y	Y
Unconditional mean	187.88	30.06	70.92	17.80	107.27	274.82	330.87
Obs.	21,563	16,694	10,803	14,879	6,802	3,310	2,772
R^2	0.750	0.711	0.880	0.567	0.816	0.870	0.843

Table 5: Occurrence of Covenants and Nonbank Dependence

This table presents the correlation between occurrence of covenants in deals and nonbank dependence of the borrower. *Nonbank Dependence* is a measure of nonbank exposure of the borrower based on the volume of nonbank term loans (Term Loan B-K) outstanding as a share of total term loans outstanding in the given quarter for the borrower. *ICR* takes a value of one if the contract has an interest coverage ratio restriction (which is the minimum EBITDA to interest expenses that the firm has to maintain). *Capex* takes a value of one if a restriction on capital expenditures exists. *Cash Sweep* takes a value of one when a cash sweep is part of the credit agreement, and zero otherwise. Cash sweeps require cash proceeds from certain activities (e.g., asset sales) are used to repay debt. *Dividend Restriction* takes a value of one if there are any material restrictions in the contract. *Performance Based Covenant* takes a value of one if there are any performance (profitability) related covenants. The performance indicators include: debt service coverage ratio, fixed charge coverage ratio, interest coverage ratio, senior debt to cash flow (EBITDA) ratio, and total debt to cashflow (EBITDA) ratio. *Capital Ratio Based Covenant* takes a value of one if covenants are formulated in terms of capital ratio–based indicators. The list of capital indicators includes: leverage, debt to tangible net worth, and senior debt leverage ratio. We include loan size, all-in-drawn-spread, all-in-undrawn-spread, and loan maturity and firm asset size as controls in all columns along with rating × year-quarter fixed effects. Robust standard errors are reported in parentheses below the coefficients. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

	(1)	(2)	(3)	(4)	(5)	(6)
	ICR	Capex	Cash Sweep	Dividend Restriction	Performance Based Covenant	Capital Ratio Based Covenant
Nonbank Dependence	0.046***	0.072***	0.231***	0.017	0.000	−0.015*
	(0.012)	(0.018)	(0.016)	(0.017)	(0.013)	(0.008)
Rating x Year-Quarter FE	Y	Y	Y	Y	Y	Y
Obs.	12,717	12,717	12,717	12,717	12,717	12,717
R^2	0.103	0.371	0.404	0.407	0.145	0.175

Table 6: Robustness to Bank-Borrower Relationships and Borrower Selection

This table presents the results on how credit line access varies with nonbank dependence of the borrower and bank-borrower relationships. Data is at the bank-borrower-year-quarter level and the sample period is 2000Q1-2022Q4. In Panel A, we measure credit line shares at issuance as a share of total loans to the borrower from each bank in a given quarter. In Panel B, we measure credit line spreads in basis points. *Nonbank Dependence* is a measure of nonbank exposure of the borrower based on the volume of nonbank term loans (Term Loan B-K) outstanding as a share of total term loans outstanding in the given quarter for the borrower. *Bank-Borrower Relationship* measures the share of total loans to a borrower over the last three years from the bank. We include borrower, borrower rating × year-quarter fixed effects, 2-digit SIC code × year-quarter fixed effects, bank × year-quarter fixed effects, and bank-borrower fixed effects. In Column 5, we restrict the sample to firms that have bank term loans outstanding. Controls for firm size, debt-to-asset ratio, loan maturity and deal purpose are included in all specifications. Standard errors are clustered at the borrower level and reported in parentheses below the coefficients. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - Credit Line Share of Total Lending

	CL/Total Loans at Issuance				
	(1)	(2)	(3)	(4)	(5)
Nonbank Dependence	−0.135***	−0.136***	−0.134***	−0.107***	−0.093***
	(0.010)	(0.010)	(0.010)	(0.009)	(0.022)
Bank-Borrower Relationship		−0.013***	−0.012***	−0.005	−0.010
		(0.004)	(0.004)	(0.004)	(0.009)
Rating x Year-Quarter FE	Y	Y	Y	Y	Y
Borrower FE	Y	Y	Y	Y	Y
Industry x Year-Quarter FE	Y	Y	Y	Y	Y
Bank x Year-Quarter FE	N	N	Y	Y	Y
Bank x Borrower FE	N	N	N	Y	Y
Sample					Has TLA
Obs.	128,111	128,111	128,028	113,553	38,700
R^2	0.720	0.720	0.729	0.780	0.859

Panel B - Credit Line Spreads (bps)

	All in drawn spread				
	(1)	(2)	(3)	(4)	(5)
Nonbank Dependence	34.359***	34.369***	34.150***	29.088***	45.566***
	(3.374)	(3.373)	(3.332)	(3.405)	(7.207)
Bank-Borrower Relationship		1.202	1.480	1.305	3.105
		(1.268)	(1.274)	(1.338)	(2.497)
Rating x Year-Quarter FE	Y	Y	Y	Y	Y
Borrower FE	Y	Y	Y	Y	Y
Industry x Year-Quarter FE	Y	Y	Y	Y	Y
Bank x Year-Quarter FE	N	N	Y	Y	Y
Bank x Borrower FE	N	N	N	Y	Y
Sample					Has TLA
Obs.	122,694	122,694	122,605	108,156	37,268
R^2	0.842	0.842	0.848	0.879	0.925

Table 7: Firm EBITDA and Credit Line Access

This table presents the covariance between credit line issuance and nonbank exposure of the borrower. Data is at the borrower-year-quarter level and the sample period is 2000Q1-2022Q4. In Panel A, we look at credit lines as a share of total lending (Columns 1-3) and as a share of total liquidity (cash plus credit lines) (Columns 4-6). In Panel B, we look at the all-in-drawn (Columns 1-3) and all-in-undrawn (Columns 4-6) spreads on credit lines. *Nonbank Dependence* is a measure of nonbank exposure of the borrower based on the volume of nonbank term loans (Term Loan B-K) outstanding as a share of total term loans outstanding in the given quarter for the borrower. We include borrower, year-quarter, or bank fixed effects. Controls for firm size, debt-to-asset ratio, loan maturity and deal purpose are included in all specifications. Standard errors are clustered at the borrower level and reported in parentheses below the coefficients. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - Credit Line Shares

	CL/Total Volume			CL/(CL+Cash)		
	(1)	(2)	(3)	(4)	(5)	(6)
	All firms	Positive EBITDA	EBITDA>10 mil	All firms	Positive EBITDA	EBITDA>10 mil
Nonbank Dependence	−0.176***	−0.071***	−0.066***	−0.035***	−0.023**	−0.030**
	(0.016)	(0.015)	(0.017)	(0.010)	(0.011)	(0.012)
Rating x Year-Quarter FE	Y	Y	Y	Y	Y	Y
Borrower FE	Y	Y	Y	Y	Y	Y
Industry x Year-Quarter FE	Y	Y	Y	Y	Y	Y
Obs.	23,517	18,912	16,346	23,514	18,907	16,345
R^2	0.537	0.578	0.576	0.729	0.731	0.726

Panel B - Credit Line Spreads

	All-in-drawn-spread			All-in-undrawn-spread		
	(1)	(2)	(3)	(4)	(5)	(6)
	All firms	Positive EBITDA	EBITDA>10 mil	All firms	Positive EBITDA	EBITDA>10 mil
Nonbank Dependence	46.920***	10.262**	11.773**	7.751***	3.023**	2.582**
	(4.458)	(4.549)	(4.783)	(1.251)	(1.279)	(1.299)
Rating x Year-Quarter FE	Y	Y	Y	Y	Y	Y
Borrower FE	Y	Y	Y	Y	Y	Y
Industry x Year-Quarter FE	Y	Y	Y	Y	Y	Y
Obs.	21,470	17,317	14,975	16,601	13,533	11,814
R^2	0.761	0.768	0.763	0.725	0.740	0.738

Table 8: Borrower Credit Access - Oil Price Shock

The table presents the results from the following regression:

$$y_{i,t} = \alpha + \text{Oil-Gas Exposure}_i \times \text{Post}_t \times \text{Rollover Risk}_i + \lambda_t + \delta_i + \epsilon_{i,t}$$

where $y_{i,t}$ is the volume and spreads on nonbank term loans and credit lines for each borrower i in quarter t. The *Oil-Gas Exposure* is the weighted average of CLO's portfolio share in oil and gas firms with the weights corresponding to the share of the borrower's loans held by the CLO prior to 2014 Q1. Sample includes firms with a Term Loan B is the quarter prior to the oil price shock (2014Q1). We measure rollover risk based on loan maturity. Firms are classified as being *Maturing TLB* if they have an outstanding Term Loan B-K (TLB) as of 2014Q1 and at least one of their TLBs are maturing during the oil price shock of 2014Q2-2016Q1. The omitted group in the regression is 2014Q1 (the quarter before the oil price shock). We include borrower fixed effects, rating fixed effects, and 2 digit SIC code, and year quarter fixed effects. In Columns (1) (3) (5) and (7), we focus on the volume of new loans extended. In Columns (2) (4) and (8), we look at the weighted average spreads on all outstanding loans of a given type. Column (6) shows the nonbank dependence as defined in the text. Standard errors are clustered at the borrower level and reported in parentheses below the coefficients. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A- All Firms

	TLB Vol.	Spread TLB	TLA Vol.	Spread TLA	Term Loans Vol.	NB Dep	CL Vol.	Spread CL
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Oil shock exposure x Post	−0.047	6.520*	−0.038	3.826	−0.074*	−0.047***	−0.074**	4.727
	(0.037)	(3.656)	(0.027)	(7.145)	(0.041)	(0.009)	(0.029)	(4.038)
Borrower FE	Y	Y	Y	Y	Y	Y	Y	Y
Ind FE	Y	Y	Y	Y	Y	Y	Y	Y
Rating FE	Y	Y	Y	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y
Obs.	9,516	7,631	9,516	4,461	9,516	9,516	9,516	8,117
R^2	0.144	0.870	0.111	0.901	0.130	0.664	0.082	0.807

Panel B - Maturing vs. Active TLB - Public Borrowers

	TLB Vol.	Spread TLB	TLA Vol.	Spread TLA	Term Loans Vol.	NB Dep	CL Vol.	Spread CL
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Oil shock exposure x Post x	−0.108***	9.707**	−0.078**	16.743**	−0.163***	0.030*	−0.103***	10.007**
Maturing TLB	(0.040)	(4.557)	(0.031)	(7.220)	(0.045)	(0.016)	(0.038)	(4.484)
Borrower FE	Y	Y	Y	Y	Y	Y	Y	Y
Ind FE	Y	Y	Y	Y	Y	Y	Y	Y
Rating FE	Y	Y	Y	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y
Obs.	9,516	7,631	9,516	4,461	9,516	9,516	9,516	8,117
R^2	0.144	0.870	0.111	0.902	0.130	0.679	0.082	0.807

Borrower Credit Access - Oil Price Shock

Panel C- Maturing vs. Active TLB - Unrated Public Borrowers

	TLB Vol.	Spread TLB	TLA Vol.	Spread TLA	Term Loans Vol.	NB Dep	CL Vol.	Spread CL
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Oil shock exposure x Post x	−0.134**	11.525	−0.060*	12.577	−0.181***	0.008	−0.165***	5.942
Maturing TLB	(0.060)	(7.158)	(0.033)	(10.086)	(0.066)	(0.020)	(0.056)	(7.115)
Borrower FE	Y	Y	Y	Y	Y	Y	Y	Y
Ind FE	Y	Y	Y	Y	Y	Y	Y	Y
Rating FE	Y	Y	Y	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y
Obs.	4,995	3,968	4,995	2,186	4,995	4,995	4,995	4,052
R^2	0.150	0.872	0.130	0.931	0.144	0.691	0.102	0.817

Panel D- Maturing vs. Active TLB - Borrowers with TLA and TLB

	TLB Vol.	Spread TLB	TLA Vol.	Spread TLA	Term Loans Vol.	NB Dep	CL Vol.	Spread CL
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Oil shock exposure x Post x	−0.077	13.117**	−0.114**	13.012**	−0.182***	0.039**	−0.107**	9.425*
Maturing TLB	(0.048)	(5.553)	(0.049)	(6.392)	(0.062)	(0.019)	(0.054)	(5.013)
Borrower FE	Y	Y	Y	Y	Y	Y	Y	Y
Ind FE	Y	Y	Y	Y	Y	Y	Y	Y
Rating FE	Y	Y	Y	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y
Obs.	5,143	4,209	5,143	3,963	5,143	5,143	5,143	4,776
R^2	0.157	0.856	0.103	0.894	0.134	0.735	0.081	0.846

Table 9: Borrower Financial and Real Outcomes - Oil Price Shock

The table presents the results from the following regression -

$$y_{i,t} = \alpha + \text{Oil-Gas Exposure}_i \times \text{Post}_t \times \text{Rollover Risk} + \lambda_t + \delta_i + \epsilon_{i,t}$$

where $y_{i,t}$ are the various financial outcomes of borrower i in quarter t. The *Oil-Gas Exposure* is the weighted average of CLO's portfolio share in oil and gas firms with the weights corresponding to the share of the borrower's loans held by the CLO prior to 2014 Q1. Sample includes firms with a Term Loan B is the quarter prior to the oil price shock (2014Q1). We measure rollover risk based on loan maturity. Firms are classified as being *Maturing TLB* if they have an outstanding Term Loan B-K (TLB) as of 2014Q1 and at least one of their TLBs are maturing during the oil price shock of 2014Q2-2016Q1. The omitted group in the regression is 2014Q1 (the quarter before the oil price shock). *Log(CL Drawdown)* is the log of drawn credit line balance in a given quarter. *Log(Cash)* is the log of cash and cash equivalents held by the firm in a given quarter. *Log(Assets)* is the log of firm size in millions of $s in a given quarter. *Capital/Assets* is the capital invested in a given quarter scaled by firm size as of 2014Q2. We include borrower fixed effects, rating fixed effects, and 2 digit SIC code, and year quarter fixed effects, and firm size controls. Standard errors are clustered at the borrower level. Standard errors are clustered at the borrower level and reported in parentheses below the coefficients. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

	Log(CL Drawdown)	Log(Cash)	Log(Assets)	Capital/Assets
	(1)	(2)	(3)	(4)
Oil shock exposure x Post x Maturing TLB	0.167*	−0.029	−0.024**	−0.025**
	(0.095)	(0.023)	(0.011)	(0.011)
Borrower FE	Y	Y	Y	Y
Ind FE	Y	Y	Y	Y
Rating FE	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y
Obs.	3,592	7,737	7,748	7,278
R^2	0.747	0.904	0.971	0.564

Appendix A1 Additional Figures and Tables

Figure A1: Comparing loan spreads

This figure plots the difference between the spread on nonbank (TLB) and bank (TLA) term loans to a given borrower in the same package.

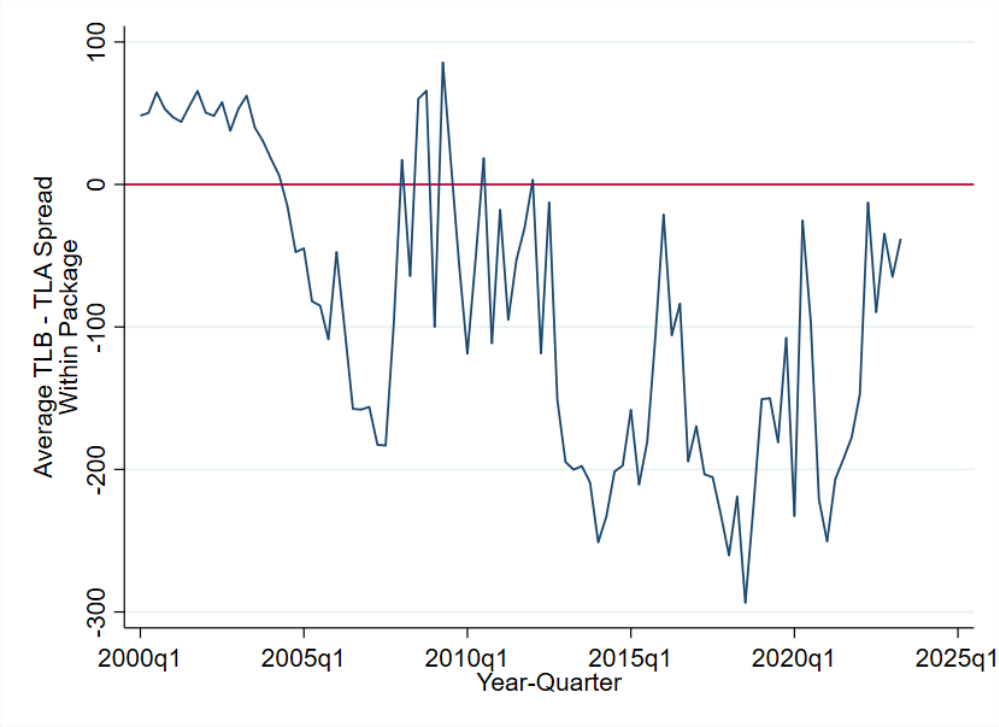
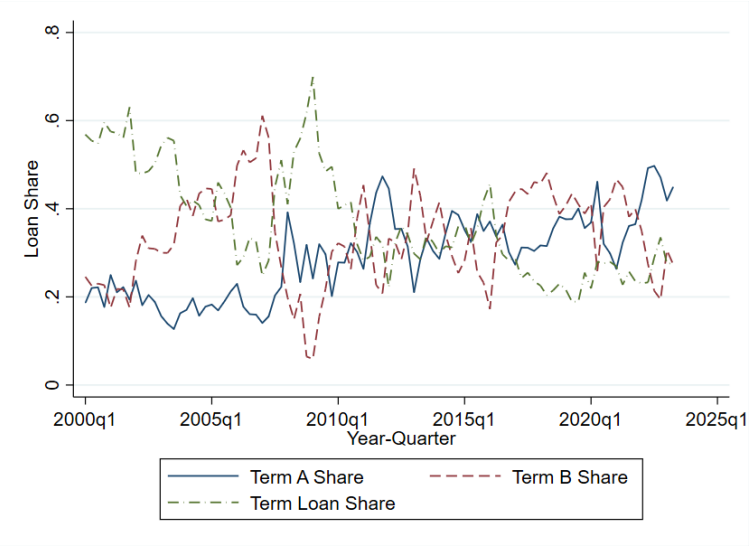


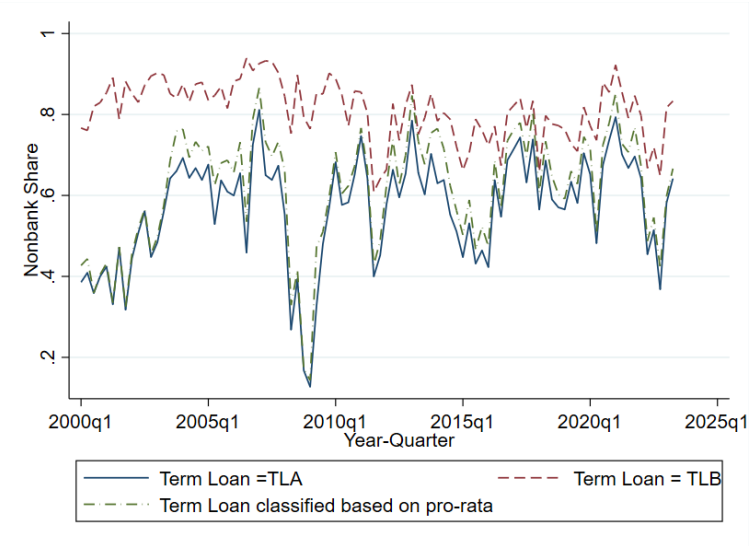
Figure A2: Alternate Measures of Nonbank Dependence

This figure presents the time-series variation in various loan categories and nonbank dependence. In Panel A, we plot the shares of loans that are classified as Term Loan A or Term Loan B or remain unclassified in DealScan. In Panel B, we calculate 3 different measures of nonbank dependence - classifying the unclassified term loans as TLA (our preferred specification), classifying the unclassified term loans as TLB, or classifying the unclassified term loans as TLA if pro-rata is one in DealScan and TLB if pro-rata is zero.

Panel A - Loan Shares



Panel B - Nonbank shares at origination using alternate definitions



Alternate Measures of Nonbank Dependence

Panel C - Nonbank dependence using alternate definitions

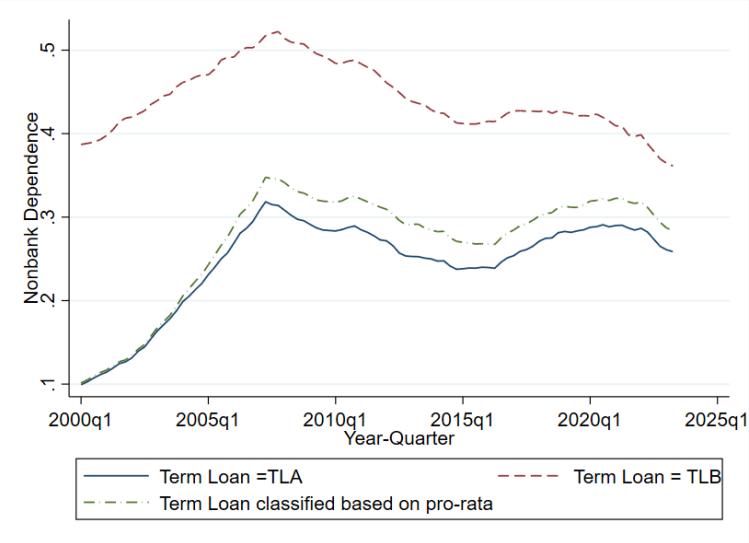
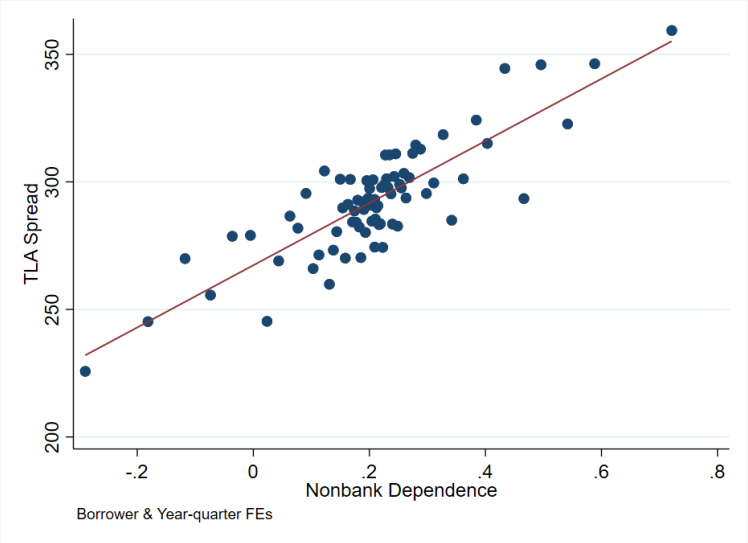


Figure A3: Cost of Term Loans vs. Outstanding Nonbank Dependence

This figure presents the binscatter plot of term loan spreads against nonbank dependence of the borrower. Data is at the borrower-year-quarter level and the sample period is 2000Q1-2020Q4. In Panel A, we measure loan spreads of newly issued loans in the given quarter. In Panel B, we measure loan spreads based on the weighted average of credit lines outstanding in the given quarter. *Nonbank Dependence* based on the volume of nonbank term loans (Term Loan B-K) outstanding as a share of total term loans outstanding in the given quarter for the borrower. *TLA Spread* is the spread on bank loans and *TLB Spread* is the spread on nonbank loans. We include borrower and year-quarter fixed effects.

Panel A - Spread on Bank Loans (bps)



Panel B - Spread on Nonbank Loans (bps)

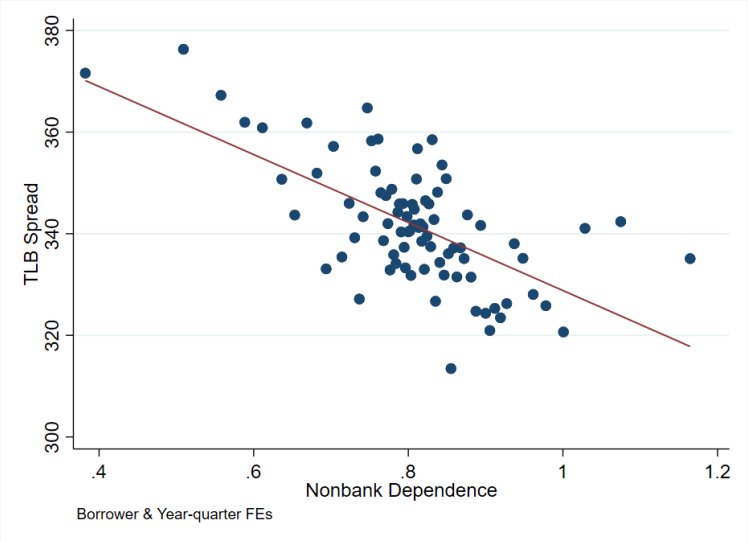
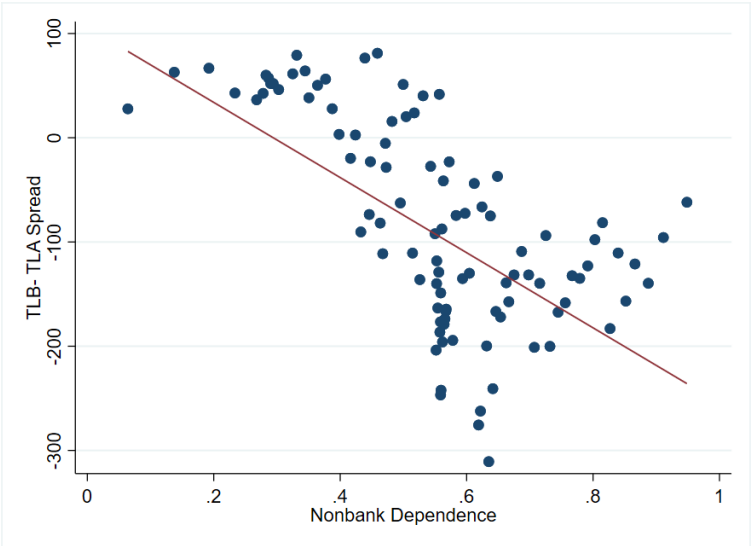


Figure A4: Difference in cost of Term Loans vs. Outstanding Nonbank Dependence

This figure presents the binscatter plot of difference in term loan spreads within a deal against nonbank dependence of the borrower. Data is at the borrower-year-quarter level and the sample period is 2000Q1-2020Q4. *Nonbank Dependence* based on the volume of nonbank term loans (Term Loan B-K) outstanding as a share of total term loans outstanding in the given quarter for the borrower. *TLA Spread* is the spread on bank loans and *TLB Spread* is the spread on nonbank loans. We include borrower and year-quarter fixed effects.



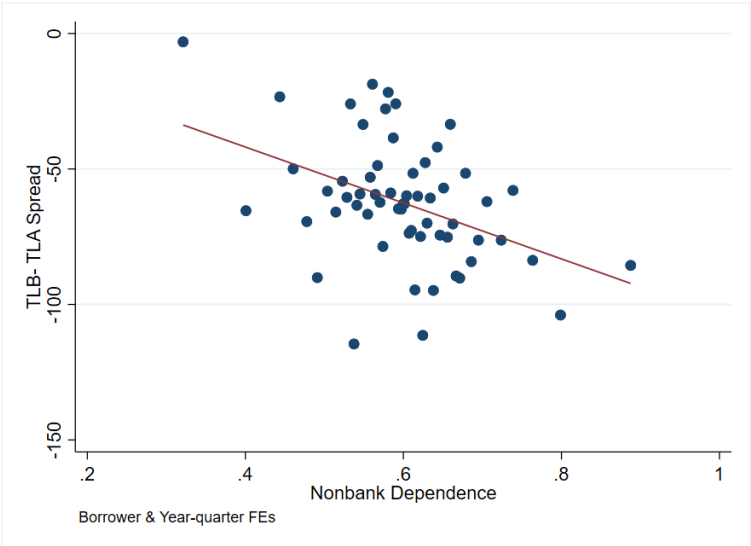
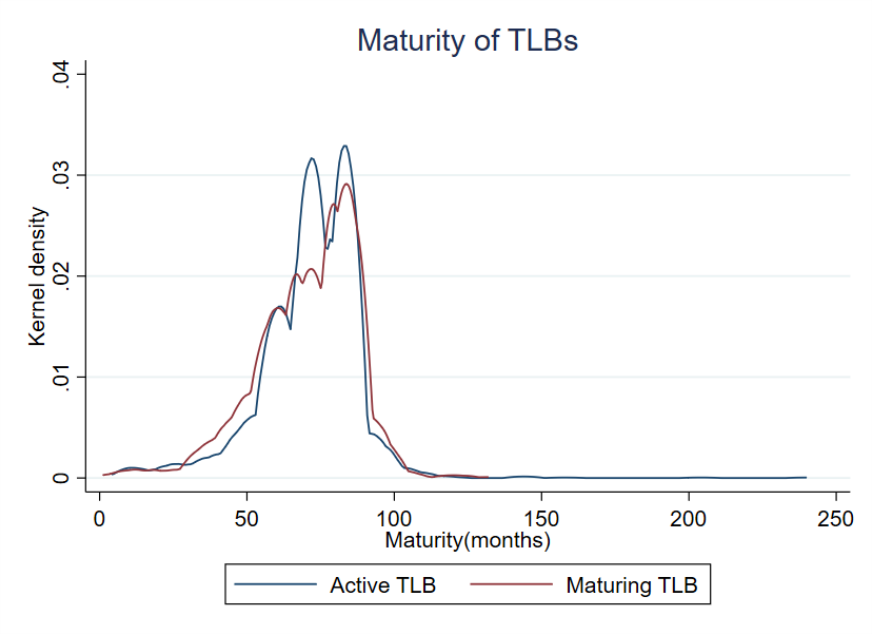


Figure A5: Comparing the loan maturity of TLB borrowers

This figure presents the kernel density of loan maturity (in months) for TLB borrowers. Sample includes firms with a Term Loan B as of 2014Q1. Firms are classified as being *Maturing TLB* if they have an outstanding Term Loan B-K (TLB) as of 2014Q1 and at least one of their TLBs are maturing during the oil price shock of 2014Q2-2016Q1. If not, they are classified as *Active TLB*. We present maturity of loans for loans originated prior to 2014Q1. Panel B shows the mean maturity of bank and nonbank term loans and bank credit lines along with a ttest for the difference. Panel C shows the Kolmogorov–Smirnov test for difference in maturity of bank and nonbank term loans and bank credit lines. Group 0 refers to the Maturing TLB sample and group 1 is the Active TLB sample

Panel A - Distribution of maturity of TLB



Panel B -Test of equality of means

Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

	Maturing TLB	Active TLB	Difference
	Mean	Mean	Mean
TLB Maturity	70.63	71.64	-1.00
TLA Maturity	62.85	61.91	0.94
CL Maturity	50.79	50.06	0.73
Observations	1976	4947	6923

Panel C -Test of equality of distributions

	Maturity TLB		Maturity TLA		Maturity CL	
Smaller Group	D	p-value	D	p-value	D	p-value
0	0.0673	0.003	0.0279	0.514	0.0115	0.729
1	-0.0406	0.115	-0.0678	0.02	-0.0501	0.002
Combined K-S	0.0673	0.005	670.0678	0.04	0.0501	0.005

Table A1: Effect of Nonbank Dependence on Credit Line Access - Robustness to alternate measures

This table presents the results on how credit line access varies with nonbank dependence of the borrower. Data is at the borrower-year-quarter level and the sample period is 2000Q1-2022Q4. In Panel A, we measure credit line shares at issuance. Columns 1 to 4 measure credit line as a share of total loans to the borrower. Columns 5-8 measure credit lines as a share of total liquidity (measured by cash plus credit lines). In Panel B, we measure credit line spreads in basis points. Columns 1 to 4 present results for all-in-drawn-spread while Columns 5-8 present results for the all-in-undrawn-spread. *Nonbank Dependence* is a measure of nonbank exposure of the borrower based on the volume of nonbank term loans (Term Loan B-K) outstanding as a share of total term loans outstanding in the given quarter for the borrower. Here, loans are classified as TLA or TLB based on the pro-rata definition in DealScan (Panel A and B) or by classifying all unclassified term loans as TLB (Panel C and D). We include borrower, borrower rating × year-quarter fixed effects, 2-digit SIC code × year-quarter fixed effects, and controls for firm size, debt-to-asset ratio, loan maturity and deal purpose. Standard errors are clustered at the borrower level and reported in parentheses below the coefficients. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - Credit Line Shares

	CL/Total Loans at Issuance				CL/(CL+Cash) at Issuance			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Nonbank Dependence	−0.232***	−0.229***	−0.166***	−0.165***	−0.052***	−0.048***	−0.029***	−0.036***
	(0.014)	(0.012)	(0.014)	(0.015)	(0.010)	(0.010)	(0.009)	(0.009)
Rating x Year-Quarter FE	N	Y	Y	Y	N	Y	Y	Y
Borrower FE	N	N	Y	Y	N	N	Y	Y
Industry x Year-Quarter FE	N	N	N	Y	N	N	N	Y
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Unconditional mean	0.72	0.72	0.71	0.71	0.65	0.65	0.65	0.65
Obs.	26,021	25,951	24,706	23,517	26,017	25,947	24,704	23,514
R^2	0.051	0.076	0.473	0.537	0.103	0.152	0.664	0.729

Panel B - Credit Line and Term Loan Costs

	Credit Line					TLA	TLB
	(1) AISD	(2) AISU	(3) Upfront fee	(4) Commitment fee	(5) TCB	(6) AISD	(7) AISD
Nonbank Dependence	46.651***	7.134***	2.486**	1.553	8.782**	171.296***	−27.190
	(4.436)	(1.177)	(1.218)	(1.047)	(3.897)	(21.212)	(27.160)
Rating x Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y
Borrower FE	Y	Y	Y	Y	Y	Y	Y
Industry x Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y	Y
Unconditional mean	187.88	30.06	70.92	17.80	107.27	274.82	330.87
Obs.	21,563	16,694	10,803	14,879	6,802	3,310	2,772
R^2	0.750	0.711	0.880	0.567	0.816	0.874	0.843

Effect of Nonbank Dependence on Credit Line Access - Robustness to alternate measures

Panel C - Credit Line Shares

	CL/Total Loans at Issuance				CL/(CL+Cash) at Issuance			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Nonbank Dependence	−0.232***	−0.229***	−0.166***	−0.165***	−0.052***	−0.048***	−0.029***	−0.036***
	(0.014)	(0.012)	(0.014)	(0.015)	(0.010)	(0.010)	(0.009)	(0.009)
Rating x Year-Quarter FE	N	Y	Y	Y	N	Y	Y	Y
Borrower FE	N	N	Y	Y	N	N	Y	Y
Industry x Year-Quarter FE	N	N	N	Y	N	N	N	Y
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Unconditional mean	0.72	0.72	0.71	0.71	0.65	0.65	0.65	0.65
Obs.	26,021	25,951	24,706	23,517	26,017	25,947	24,704	23,514
R^2	0.051	0.076	0.473	0.537	0.103	0.152	0.664	0.729

Panel D - Credit Line and Term Loan Costs

	Credit Line					TLA	TLB
	(1) AISD	(2) AISU	(3) Upfront fee	(4) Commitment fee	(5) TCB	(6) AISD	(7) AISD
Nonbank Dependence	46.651***	7.134***	2.486**	1.553	8.782**	171.296***	−27.190
	(4.436)	(1.177)	(1.218)	(1.047)	(3.897)	(21.212)	(27.160)
Rating x Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y
Borrower FE	Y	Y	Y	Y	Y	Y	Y
Industry x Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y	Y
Unconditional mean	187.88	30.06	70.92	17.80	107.27	274.82	330.87
Obs.	21,563	16,694	10,803	14,879	6,802	3,310	2,772
R^2	0.750	0.711	0.880	0.567	0.816	0.874	0.843

Table A2: Firm characteristics - By CLO Oil Exposure

This table presents the summary statistics for borrowers with a nonbank loan (Term Loans B-K) outstanding as of 2014Q1. The panel is at the borrower level and information is presented as of 2014Q1 (pre oil price shock). We present results separately for borrowers with low and high exposure to the oil-gas shock based on CLO holdings. The *Oil-Gas Exposure* is the weighted average of CLO's portfolio share in oil and gas firms with the weights corresponding to the share of the borrower's loans held by the CLO prior to 2014 Q1. *Nonbank Dependence* is the share of term loans to the borrower from nonbanks. *Assets* are the average firm asset size from Compustat. *Total Debt/Assets* is total firm debt to assets. *Cash/Assets* is the amount of cash and cash equivalents at the firm scaled by firm assets. *Log(CL Outstanding)* is the log of total volume of credit line available to the firm in millions of dollars. *Avg. Drawn Spread on Outstanding CL* is the average all-in-drawn-spread on credit lines outstanding to the borrower in bps. *Log(TLB Outstanding)* is the log of total volume of nonbank loans available to the firm in millions of dollars. *Avg. Drawn Spread on Outstanding TLB* is the average all-in-drawn-spread on nonbank loans outstanding to the borrower in bps. In Panel A, above median oil-gas exposure firms are classified as *High Oil-Gas Exposure*. In Panel B, borrowers with TLB maturing during the oil price shock between 2014Q2 and 2015Q4 are classified as *Maturing TLB*.

Panel A- Borrower characteristics by oil-gas exposure

	Low Oil-Gas Exposure			High Oil-Gas Exposure			Difference
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean
Oil-gas exposure	0.00	0.00	0.00	0.04	0.04	0.01	-0.04***
Nonbank Dependence	0.59	0.71	0.43	0.81	0.94	0.26	-0.23***
Assets ($ bil.)	8.59	2.31	38.85	20.11	2.41	146.15	-11.52
Total Debt/Assets	0.37	0.34	0.30	0.49	0.45	0.29	-0.12***
Cash/Assets	0.11	0.07	0.14	0.07	0.05	0.08	0.04***
Share unrated firms	0.76	1.00	0.43	0.62	1.00	0.48	0.14***
Log(CL Outstanding)	5.26	5.36	1.57	5.52	5.53	1.46	-0.26*
Avg. Drawn Spread on Outstanding CL (bps)	317.43	300.00	141.32	344.21	325.00	135.07	-26.78*
Log(TLB Outstanding)	5.91	5.90	1.40	6.68	6.56	1.11	-0.76***
Avg. Spread on Outstanding TLB (bps)	413.48	400.00	140.99	408.35	382.56	125.94	5.13
Observations	486			484			970

Panel B- Borrower characteristics by TLB maturity

	Active TLB			Maturing TLB			Difference
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean
Oil-gas exposure	0.02	0.02	0.02	0.02	0.00	0.02	0.00**
Nonbank Dependence	0.66	0.82	0.40	0.82	0.92	0.23	-0.16***
Assets ($ bil.)	15.19	2.15	125.17	15.30	3.29	66.38	-0.11
Total Debt/Assets	0.43	0.40	0.30	0.47	0.45	0.28	-0.04
Cash/Assets	0.09	0.05	0.11	0.08	0.04	0.11	0.01
Share unrated firms	0.69	1.00	0.46	0.69	1.00	0.46	-0.00
Log(CL Outstanding)	5.30	5.39	1.46	5.74	5.86	1.60	-0.44***
Avg. Drawn Spread on Outstanding CL (bps)	332.98	319.48	139.03	333.09	312.28	136.40	-0.11
Log(TLB Outstanding)	6.24	6.19	1.21	6.62	6.72	1.46	-0.38***
Avg. Spread on Outstanding TLB (bps)	420.73	400.00	133.50	385.59	360.25	126.25	35.14***
Observations	731			239			970

Table A3: Borrower Credit Access - Oil Price Shock - Bank Borrower Level

The table presents the results from the following regression:

$$y_{i,b,t} = \alpha + \text{Oil-Gas Exposure}_i \times \text{Post}_t \times \text{Rollover Risk}_i + \lambda_{b,t} + \delta_i + \epsilon_{i,t}$$

where $y_{i,t}$ is the volume and spreads on nonbank term loans and credit lines for each borrower i in quarter t from bank b. Banks are classified into 2 main groups - LISCC banks that were affected by stricter leveraged lending guidelines and non-LISCC banks. The *Oil-Gas Exposure* is the weighted average of CLO's portfolio share in oil and gas firms with the weights corresponding to the share of the borrower's loans held by the CLO prior to 2014 Q1. Sample includes firms with a Term Loan B is the quarter prior to the oil price shock (2014Q1). We measure rollover risk based on loan maturity. Firms are classified as being *Maturing TLB* if they have an outstanding Term Loan B-K (TLB) as of 2014Q1 and at least one of their TLBs are maturing during the oil price shock of 2014Q2-2016Q1. The omitted group in the regression is 2014Q1 (the quarter before the oil price shock). We include borrower fixed effects, rating fixed effects, aIn Columns (1) (3) (5) and (7), we focus on the volume of new loans extended. In Columns (2) (4) and (8), we look at the weighted average spreads on all outstanding loans of a given type. Column (6) shows the nonbank dependence as defined in the text. Standard errors are clustered at the borrower level and reported in parentheses below the coefficients. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

	TLB Vol.	Spread TLB	TLA Vol.	Spread TLA	Term Loans Vol.	NB Dep	CL Vol.	Spread CL
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Oil shock exposure x Post x	−0.093***	9.380**	−0.063**	16.729**	−0.134***	0.025	−0.083**	10.642**
Maturing TLB	(0.035)	(4.659)	(0.026)	(7.628)	(0.040)	(0.016)	(0.034)	(4.450)
Borrower FE	Y	Y	Y	Y	Y	Y	Y	Y
Ind FE	Y	Y	Y	Y	Y	Y	Y	Y
Rating FE	Y	Y	Y	Y	Y	Y	Y	Y
LISCC x Year-Quarter FE	Y	Y	N	N	N	N	Y	Y
Obs.	18,716	13,782	18,716	8,845	18,716	17,812	18,716	15,531
R^2	0.133	0.831	0.105	0.900	0.122	0.733	0.081	0.784

Table A4: Variable Definitions

Name	Definition	Source
Bank Term Loan	Facility type - "Term Loan A" and "Term Loan"	DealScan
Nonbank Term Loan	Facility type - "Term Loan B-K"	DealScan
Bank borrower	Borrowers that only have bank term loans	DealScan
Nonbank borrower	Borrowers that have atleast one nonbank term loans	DealScan
Nonbank Dependence	Calculated based on outstanding loans for a borrower in a given quarter. Nonbank dependence is the amount of nonbank loans outstanding as a share of total term loans outstanding. We calculate three different measures of nonbank dependence using loan definitions in DealScan. Unclassified term loans are classified as TLA in our preferred specification. Alternatively, unclassified term loans are classified as TLB. Or, in our third classification, unclassified term loans that are "institutional" and do not have a pro-rata payment structure are classified as TLB, and loans that are not "institutional" but have a pro-rata payment structure are classified as TLB.	DealScan
Nonbank Share	Nonbank share is the amount of nonbank loans issued as a share of total term loans issued	DealScan
Credit Line Share	Credit lines at issuance (outstanding) as a share of total loan volume issued (outstanding)	DealScan
Total Loan Volume	Sum of all loans issued (outstanding) in a given quarter	DealScan
Term Loan Volume	Sum of all term loans issued (outstanding) in a given quarter	DealScan
Credit Line Utilization	One minus undrawn credit line balance divided by total credit line balance: 1-$\frac{undrawncrdtportionrevolvingcrdt}{outstandingbalrrevolvingcredit}$. We fill missing Q1 to Q3 values in one calendar year with Q4 values or missing Q1 values with Q2 values and missing Q3 values with Q4 values if available.	Capital IQ

Variable Definitions

Name	Definition	Source
Loan Size (mil.)	Size of loan facility in millions of dollars [*tranche_amount*]	DealScan
Drawn spreads / AISD	Spread on term loans or the drawn portion of credit lines - sum of spread plus facility fee (annual fee paid on the entire committed amount) [*all_in_spread_drawn_bps*]	DealScan
Undrawn spreads / AISU	Spread on the undrawn portion of credit lines - sum of commitment fee plus facility fee [*all_in_spread_drawn_bps*]	DealScan
Upfront fee	A fee paid by the borrower to lenders upon closing of a loan [*upfront_fee_bps*]	DealScan
Commitment Fee	The fee paid by borrowers on unused loan commitments [*commitment_fee_bps*]	DealScan
TCB	Total Cost of Borrowing accounting for spreads and fees as per **?**	DealScan + author calculations
Maturity (months)	Maturity of the loan at origination in months [*tenor_maturity*]	DealScan
Interest Coverage Ratio (ICR) covenant	Takes a value of one if the contract has an interest coverage ratio restriction (which is the minimum EBITDA to interest expenses that the firm has to maintain)	DealScan
Capex covenant	Takes a value of one if a restriction on capital expenditures exists	DealScan
Cash Sweep covenant	Takes a value of one when a cash sweep is part of the credit agreement, and zero otherwise. Cash sweeps require cash proceeds from certain activities (e.g., asset sales) are used to repay debt.	DealScan
Dividend Restriction covenant	Takes a value of one if there are any material restrictions in the contract	DealScan
Performance Based Covenant	Takes a value of one if there are any performance (profitability) related covenants. The performance indicators include: debt service coverage ratio, fixed charge coverage ratio, interest coverage ratio, senior debt to cash flow (EBITDA) ratio, and total debt to cashflow (EBITDA) ratio	DealScan
Capital Ratio Based Covenant	Takes a value of one if covenants are formulated in terms of capital ratio–based indicators. The list of capital indicators includes: leverage, debt to tangible net worth, and senior debt leverage ratio.	DealScan

Variable Definitions

Name	Definition	Source
GFC	Takes a value of 1 between 2007Q2 and 2009Q2	-
COVID-19	Takes a value of 1 in 2020Q1	-
Oil Price Shock	Takes a value of 1 between 2014Q2 and 2016Q1	-
Assets	Firm asset size	Compustat
Cash/Assets	Amount of cash and cash equivalents at the firm scaled by firm assets	Compustat
Total Debt/Equity	Total firm debt to shareholders equity	Compustat
Total Debt/Assets	Total firm debt to assets	Compustat
Credit Line/(Credit Line+Cash)	is the amount of credit line outstanding as a share of total cash and credit lines outstanding to the borrower	Compustat
Rating and Share Unrated	Group classification based on long-term issuer rating with separate groups for ratings from AAA to C and unrated borrowers. Share unrated are the share of borrowers without a risk rating	Compustat
Bank-borrower relationship	Share of total loans to a borrower over the last three years from a given bank	DealScan
Oil shock exposure	Calculated for each CLO as the share of their portfolio holdings in oil & gas firms as of 2014 May. At the borrower level, we calculate a weighted average of CLO oil& gas exposure based on share of TLBs of the borrower held by each CLO	LCD, DealScan, Creditflux
Maturing and Active TLBs	Firms are classified as being *Maturing TLB* if they have an outstanding Term Loan B-K (TLB) as of 2014Q1 and at least one of their TLBs are maturing during the oil price shock of 2014Q2-2016Q1. *Active TLB* borrowers have an outstanding Term Loan B-K (TLB) as of 2014Q1 and none of their TLBs are maturing during the oil price shock of 2014Q2-2016Q1.	DealScan

Online Appendix

Fragile Financing?
How Corporate Reliance on Shadow Banking Affects their Access to Bank Liquidity

Viral V. Acharya Manasa Gopal Sascha Steffen

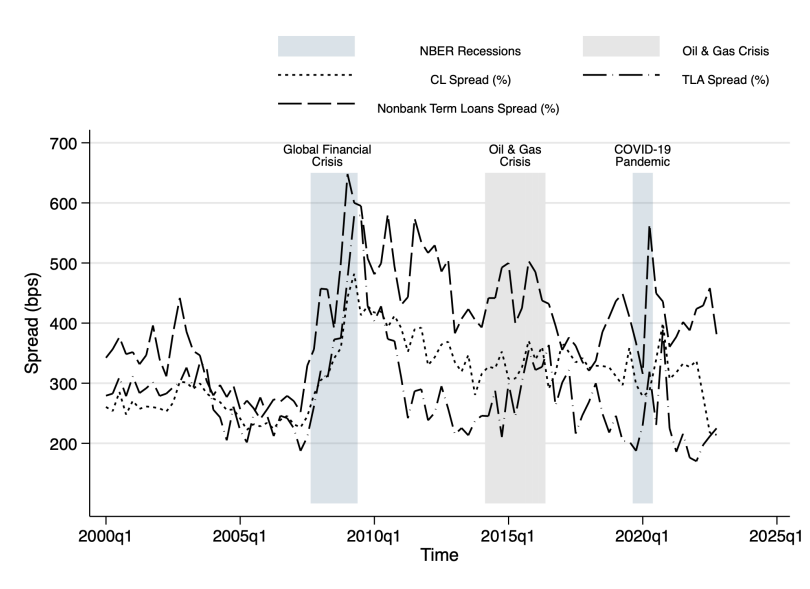
This version: April 28, 2025

OA1.1 Deal Terms

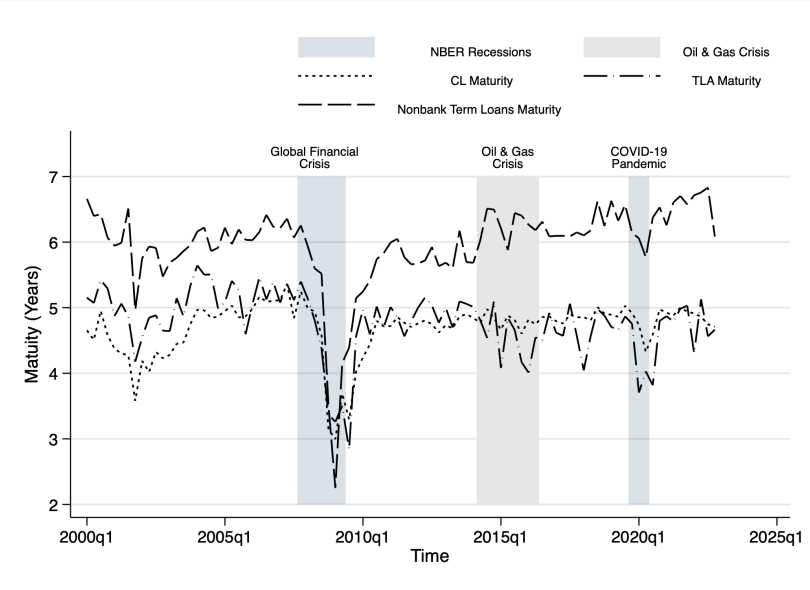
Figure OA1: Deal Terms - Pricing and Maturity

This figure plots price and non-price loan terms. Panel A shows the average spreads quarterly for each loan type and Panel C shows the average maturity. Data are winsorized at the 1 and 99 percent levels. Data source: Leveraged Loan Commentary and Data (LCD). Loans do not include Add-Ons, DIP loans or second lien loans.

Panel A - Spread



Panel B - Maturity



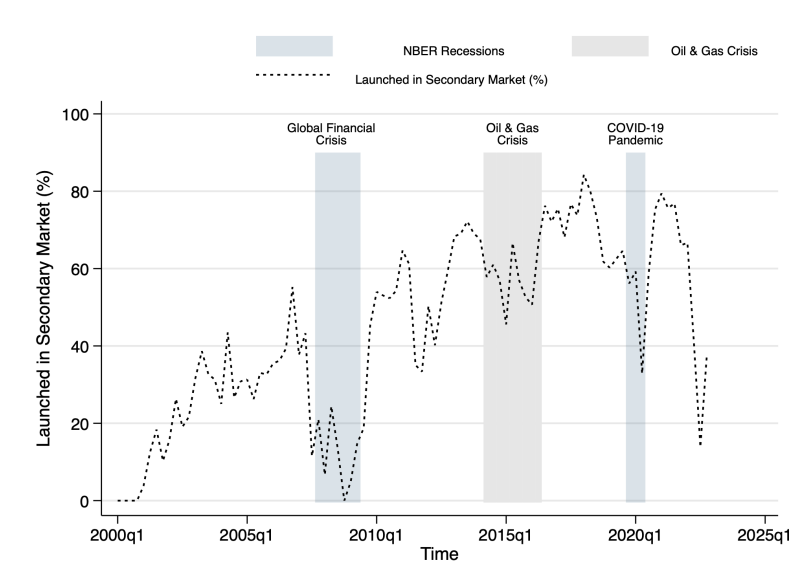
OA1.2 Institutional Investor Demand

OA1.2.1 Secondary Market Trading

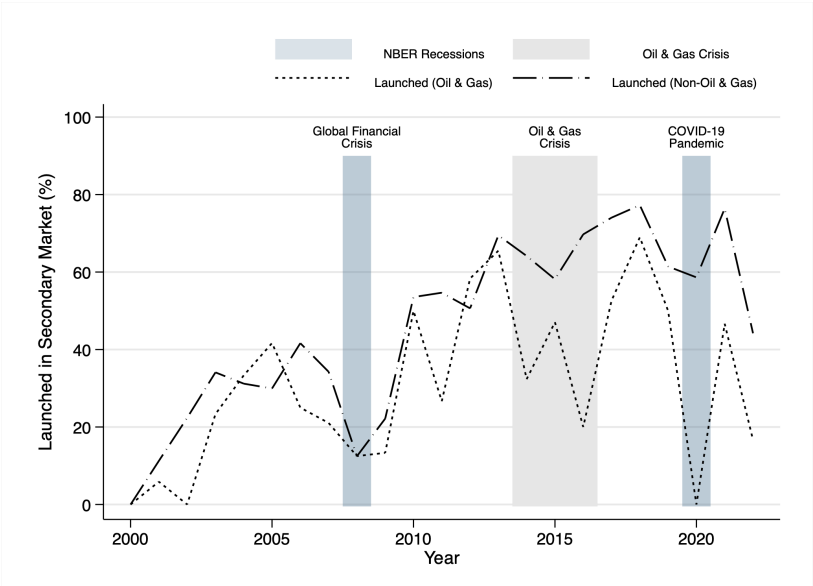
Figure OA3: Secondary Market Trading

This figure plots the likelihood to launch of loans. The likelihood is calculated based on whether a loan is traded if there is a "break date" , i.e. a first date on which the loan is traded. Data source: Leveraged Loan Commentary and Data (LCD).

Panel A - Likelihood to Launch



Panel B - Likelihood to Launch - Oil & Gas Firms

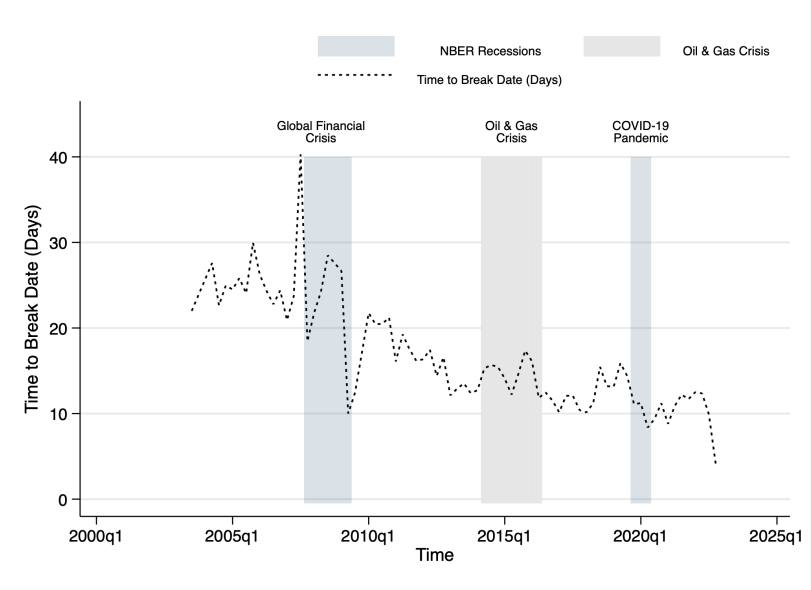


OA1.2.2 Time to Launch on the Secondary Market

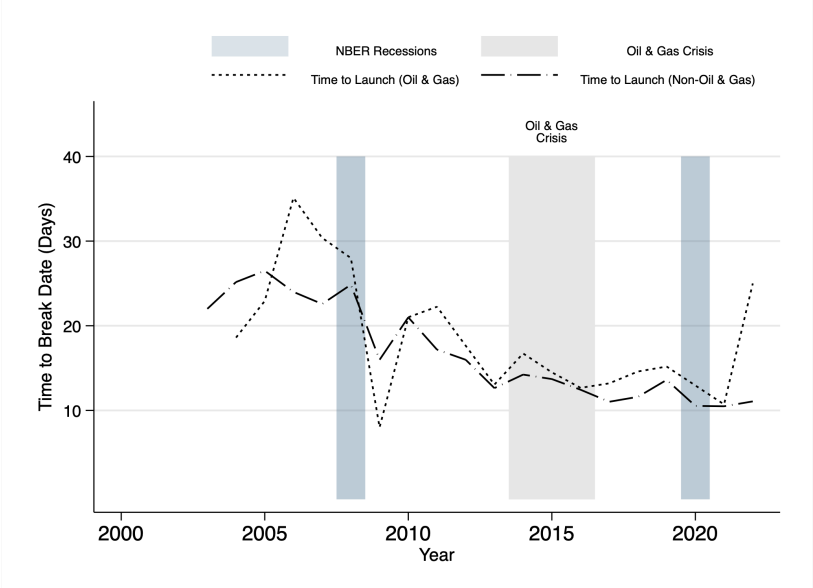
Figure OA4: Time to Launch

This figure plots the time taken in days to launch a deal. Panel A plots the average time to launch for all borrowers and Panel B plots the average time to launch separately for borrowers in the oil and gas sector and other borrowers. Data source: Leveraged Loan Commentary and Data (LCD).

Panel A - Time to Launch Date - Oil & Gas Firms



Panel B - Time to Launch Date - Oil & Gas Firms

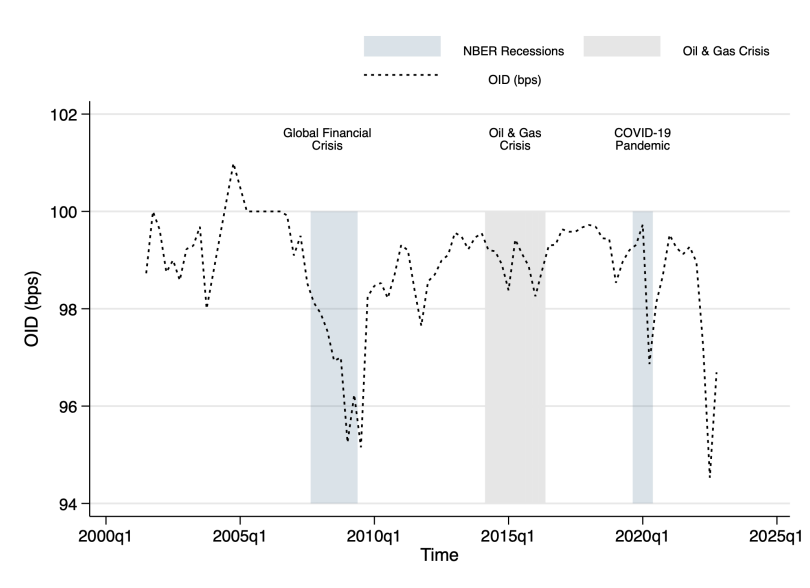


OA1.2.3 Original Issue Discount

Figure OA5: Original Issue Discount

This figure plots the original issue discount for loans. Panel A plots the average OID for all borrowers and Panel B plots the average OID separately for borrowers in the oil and gas sector and other borrowers. Data source: Leveraged Loan Commentary and Data (LCD).

Panel A - OID



Panel B - OID - Oil & Gas Firms