

Fragile Financing?

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

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This version: June 24, 2026*

Abstract

Does corporations' reliance on nonbank financing limit their access to bank liquidity? We show in panel tests that banks ration the extension of credit lines to nonbank-dependent borrowers. We link this phenomenon to the rollover risk of nonbank-held term loans by exploiting the 2014–16 oil-price collapse as a plausibly exogenous contraction in nonbank credit supply, transmitted to non-oil borrowers through their CLOs' pre-shock oil exposure. Firms with maturing nonbank loans saw bank credit line volumes shrink and spreads widen. Firms reliant on nonbank financing thus face a double whammy: when nonbank credit dries up, bank liquidity insurance is withdrawn.

JEL classification: G01, G21, G23

Keywords: Nonbank financing, CLOs, Rollover risk, Credit lines, Syndicated loans

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Does corporations’ reliance on nonbank financing limit their access to bank liquidity? We show in this paper that such reliance makes firms fragile: because nonbank credit is subject to rollover risk, banks ration the credit lines they extend to nonbank-dependent borrowers, withdrawing liquidity insurance precisely when it is most valuable.

The fragility we document is the product of a deeper shift in how corporate credit is provided. Over the past two decades, the growth of nonbank financial intermediation has transformed the corporate credit market. Institutional investors – most prominently collateralized loan obligations (CLOs), loan mutual funds, and other asset managers – now finance a large share of syndicated term loans to nonfinancial corporations (Irani et al. 2021, Saunders et al. 2025). As of 2024, nonbank funding represents roughly 60% of all term loans, and for many borrowers it represents the majority of term debt; conditional on having nonbank term loans at all, the average firm obtains about 76% of its term loans from nonbanks.¹ At the same time, banks are still the primary providers of credit lines.

Term loans and credit lines serve fundamentally different functions. Term lending bridges financing needs over time, and therefore induces refinancing and rollover risk when maturities come due; institutional term loans (Term Loan B, or TLB, tranches) magnify that risk, because they typically carry bullet maturities and are held by investors whose own capacity to refinance is itself cyclical (Fleckenstein et al. 2026). Credit lines, in contrast, provide liquidity insurance for borrowers by smoothing outcomes across different states of the world: a firm pays a fee for a committed line and may draw on it, at pre-arranged terms, when funding needs arise; the option is thus most valuable in adverse states for borrowers.² Banks have a natural advantage in supplying this insurance, because they fund themselves with relatively stable, insured liabilities and can access central bank liquidity (Kashyap et al. 2002, Gatev and Strahan 2006).³ However, when many firms draw simultaneously, committed-but-undrawn capacity turns into immediate balance-sheet usage and bank balance sheets can become encumbered by liquidity and capital needs (Acharya et al. 2024).

In this paper, we ask whether the shift in term lending to nonbanks affects the availability of bank liquidity insurance, and if yes, what are the consequences for corporations. A natural null hypothesis is that the rise of nonbank term lending should be largely orthogonal to banks’ ex-ante willingness to provide credit lines (Berlin et al. 2020). Under this view, banks can supply liquidity insurance regardless of whether a firm’s term debt is held by banks or by institutional investors, because a firm’s drawdown risk is determined by its own fundamentals

¹We document the size of this sector in Online Appendix Figure OA1.

²Theoretical 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.

³A notable exception is when banks are themselves vulnerable to runs, as in the Global Financial Crisis of 2007–08; see Acharya and Mora (2015).

rather than by the identity of its financiers.

Our starting point, however, is the alternative: the liquidity risk a bank insures through a credit line is shaped by the cyclicalities of the borrower’s term-financing providers. Nonbanks lack an insured deposit base and have no direct access to a lender-of-last-resort backstop, so their ability to refinance and expand term lending is more sensitive to market-wide and cyclical shocks. When refinancing conditions deteriorate, firms that rely on nonbank term debt have a stronger incentive to draw on their committed bank lines. Consistent with this premise, Figure 1 shows that nonbank-dependent borrowers draw down their lines most heavily precisely during aggregate-stress episodes.⁴ Reliance on nonbank term finance, thus, raises the *systematic component* of drawdown risk on bank credit lines – the component banks cannot diversify away; it is this correlation with bad states, rather than a higher unconditional level of drawdowns, that makes nonbank dependence costly for banks to insure.

In summary, that banks price a borrower’s expected drawdown risk is not in question; what we ask, however, is whether that risk depends on *who* holds the firm’s term debt, in particular, their cyclicalities, once the firm’s own fundamentals (leverage, cash, profitability, and credit quality) are accounted for. If what banks price is the expected bad-state drawdown that a firm’s funding mix induces – larger, and more correlated with aggregate stress, then two implications follow which we test in turn.

First, in the cross-section, banks ration and reprice credit lines to firms with greater non-bank dependence. Secondly, when there is a contractionary shock to the supply of nonbank financing, the same logic predicts a dynamic response. Borrowers whose nonbank loans do not mature during the shock face no immediate rollover problem; and because the nonbank market is largely closed to new issuance, their reliance on nonbank funding falls, tilting their financing back toward banks. Hence, banks extend more credit-line liquidity to this group. In contrast, for the group of borrowers who must roll over their nonbank debt – exactly those for whom a drawdown is more likely in a bad state – banks ration their provision of liquidity insurance. This mechanism, therefore, implies a “double whammy” for nonbank-dependent firms in stress periods: rollover risk rises in nonbank financing of term loans at the same time that bank-provided liquidity insurance becomes less available and more expensive. A corollary is that nonbank lender heterogeneity matters. If a particular form of nonbank finance is better able to absorb aggregate shocks, the induced drawdown externality for banks should be weaker and so should the retrenchment in credit line supply.

We take these implications to the data on U.S. syndicated loans between 2000-2024.⁵

⁴Online Appendix Table OA2 shows the same higher drawdown propensity and intensity for nonbank-dependent firms during the COVID-19 pandemic.

⁵The syndicated loan market exceeds \$3.1 trillion in outstanding volume as of 2024 (\$6.4 trillion including committed credit lines). See <https://www.fdic.gov/2024-snc-program-report>

Here, a lead arranger structures a loan package and distributes its facilities along segmented lines: banks retain revolving credit lines and amortizing Term Loan A (TLA) tranches on balance sheet, while nonbanks hold the longer-maturity, bullet-repayment TLB tranches. We measure a firm’s *Nonbank Dependence* as the share of its outstanding term loans held by nonbanks, classifying TLA as bank debt and TLB through TLK (so-called institutional financing) as nonbank debt, following the literature (Standard and Poors 2020, Ivashina and Sun 2011, Nini 2008, Fleckenstein et al. 2026). Figure 2 shows that, while nonbank funding often exceeds 60% of a firm’s term loans, it dips sharply during the 2008–09 financial crisis, the 2014–16 oil price collapse, and the onset of COVID-19 – underscoring the cyclicity and fragility of nonbank supply.

In this setting, we document a negative relationship between a firm’s nonbank dependence and its access to bank credit lines. We first show in panel tests that firms with higher nonbank dependence receive smaller credit lines and pay more for the lines they obtain. Moving a borrower from fully bank- to fully nonbank-financed lowers the credit-line share of total loans by 16.4 percentage points and the credit-line share of total liquidity by 3.3 points, and raises drawn and undrawn spreads by 40.4 and 5.3 basis points. The pattern holds whether we look at credit line origination in dollars, or if we scale credit lines by assets or by sales, and whether we measure contemporaneous originations (flow) or the total outstanding commitments (stock). Moreover, we show in the time series that firms more reliant on nonbank funding face more cyclical credit-line availability and, consequently, hold more cash relative to total liquidity than bank-dependent firms.

Because these effects could reflect selection rather than due to rollover risk from nonbank financing, we subject them to an extensive set of alternative explanations: lack of bank relationships, bank–nonbank matching, collateral and covenant selection, supervisory restrictions on banks from lending to negative-EBITDA borrowers, and time-invariant borrower type (identified from “switcher” firms observed on both sides of the nonbank-dependence margin). Each of these alternative explanations is rejected in turn. Importantly, controlling for a firm’s own market beta leaves the effect intact, so what banks price is the cyclicity of a firm’s *financiers*, not the firm’s own systematic risk.

Cross-sectional controls, however thorough, cannot fully rule out selection on unobservables. To establish causality, we exploit a plausibly exogenous contraction in nonbank credit supply: the 2014–16 oil-price collapse, a severe and unexpected decline of about 70% in oil prices. As the stock prices and secondary-market loan prices of oil and gas firms fell, CLOs holding those loans came under pressure and new CLO issuance fell roughly 60%, choking off the primary supply of TLB credit; some CLOs, close to breaching covenants, were forced to offload even loans of firms not exposed to the oil shock, while bank term loans and credit

lines held steady or rose slightly. Crucially for identification, there was neither an aggregate downturn in the economy nor a meaningful threat to banking-sector health during this period (Kundu 2023, Saunders et al. 2025, Giannetti and Meisenzahl 2023).

We construct a panel of firms from January 2012 through December 2017 – nine quarters before the collapse (2012Q1–2014Q1), seven quarters during it (2014Q2–2015Q4), and eight quarters afterward – and focus on firms *outside* the oil-and-gas sector, so that the shock reaches the firms we study only *indirectly*, raising rollover risk for non-oil borrowers funded by oil-exposed CLOs rather than operating through their own fundamentals. We measure each firm’s exposure as the loan-weighted, pre-shock oil-and-gas portfolio share of its CLOs. We stratify firms by rollover risk – whether a TLB matures *during* the shock window – dating each loan tranche by its effective maturity as of the last pre-shock amendment, so the classification reflects the borrower’s pre-determined contractual schedule and cannot be an artifact of any refinancing the firm undertakes in response to the shock itself.

Consistent with the dynamic laid out above along our second hypothesis, we find that for firms whose nonbank loans do *not* mature during the shock window – the active-TLB group, which faces no immediate rollover problem and whose nonbank dependence falls mechanically as the new-issue market freezes – banks extend *more* committed credit-line capacity. On the other hand, for firms with *maturing* TLBs – those who must refinance mid-shock, and for whom a drawdown is therefore most likely to be triggered in a bad state – banks do the reverse: credit-line outstanding amount falls about 17%, new credit-line issuance falls about 12%, and spreads rise about 10 basis points. Bank credit-line quantities falling while bank credit-line prices rise for the maturing group suggests bank rationing rather than slackening demand. Before the shock, the changes in credit lines for both groups hover near zero, reinforcing that the shock itself triggers the divergence. Splitting each firm’s credit-line stock into newly originated versus pre-existing lines shows the two groups move along different margins. For active-TLB firms the credit line stock rises through the extensive margin of new originations, while maturing-TLB firms see a contraction of pre-existing lines. This rules out the concern that a bank arranger unable to place a deal’s TLB tranche simply shrinks the entire bundled package, credit lines included, because amending or upsizing an existing credit line requires no TLB distribution at all. The divergence is therefore ex-ante rationing by banks keyed to the borrower’s rollover risk, not an inability to syndicate.

Importantly, we find that even relatively modest oil-and-gas exposure at the CLO level – a median portfolio share of roughly 3% – translates into meaningful credit-access effects, because CLO constraints are nonlinear. Specifically, CLOs must satisfy par-based overcollateralization (OC) and interest-coverage (IC) tests, and the median CLO enters the shock with only thin slack. Greater pre-shock oil exposure significantly compresses the junior-OC

and IC cushions toward their triggers. To defend covenant compliance, these CLOs shed *non-oil* collateral: a loan held more heavily by oil-exposed CLOs trades lower despite the loan itself having no oil exposure. This impairs the CLO’s capacity to absorb new issuance, and firms whose nonbank debt comes due cannot roll it over. Banks, recognizing that these borrowers must instead draw on committed lines precisely in a bad aggregate state, ration credit-line access *ex ante*.

We also confirm that these oil-shock results are not an artifact of confounds specific to 2014–16. The episode coincided with the supervisory restrictions on leveraged lending introduced by the Leveraged Lending Guidelines (LLG), raising the possibility that the shift from nonbank to bank lending reflects regulation rather than the CLO channel. But the LLG predicts differential treatment of leveraged-loan borrowers and makes no prediction about CLO oil exposure, since the guidelines do not condition on whether a borrower’s CLOs hold oil and gas loans. Because the LLG was enforced most intensively at the largest, most systemically important banks—those in the Large Institution Supervision Coordinating Committee (LISCC)—we re-examine our credit-line volume and spread effects among low-leverage borrowers at non-LISCC banks, the borrowers and banks least subject to LLG scrutiny, and find similar effects. We conduct a battery of further checks: maturing-TLB firms that recently accessed the market are still affected (ruling out the concern that differences are driven by a firm’s inability to finance pre-shock), direct bank oil exposure does not explain lending changes, and entropy balancing on pre-shock fundamentals leaves results unchanged.⁶ Finally, a placebo that dates rollover risk from maturing bank term loans (TLAs) produces no significant credit-line effect, confirming that the maturing-TLB classification captures nonbank rollover risk specifically, not generic debt-maturity risk.

If banks ration because they internalize this drawdown risk, the rationing should be most severe where banks are least able to absorb it, and it is. In the broad cross-section, better-capitalized and more liquid banks attenuate the negative nonbank-dependence effect on credit-line volume by roughly half and charge a smaller spread premium. Within the oil shock, the same bank cuts credit-line outstanding and raise drawn spreads more to their maturing high-exposure borrowers. This repricing is concentrated among banks with low pre-shock liquidity and capital, and is near zero at well-buffered banks.

How did the firms rationed by banks for new credit lines 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 balance sheets,

⁶The oil price decline also coincided with a broader deterioration in credit conditions, especially in high-yield markets, and a growth slowdown in China. We address this concern through industry×quarter fixed effects (which absorb macro forces at the industry level), borrower-level cyclical controls, and a credit-cycle horse race against aggregate stress measures; all of our results continue to hold.

as we observe a significant reduction in both assets and total invested capital. 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. Finally, we show that firms less reliant on nonbank sources of funding *prior* to the oil price shock are better able to mitigate its adverse effects. Specifically, these firms secure greater and cheaper access to bank-provided liquidity during the shock period, hold lower cash buffers, and sustain higher levels of investment.

Lastly, our mechanism implies that lender heterogeneity matters: a source of nonbank term financing better able to absorb aggregate shocks should generate a weaker drawdown externality and, correspondingly, weaker retrenchment in bank provision of liquidity insurance. Consistent with this, we find the access to bank liquidity is substantially lower when firms rely on nonbank investors in the institutional loan market relative to the bond market, likely stemming from the greater rollover risk of institutional loans relative to bonds.

Overall, our paper contributes to several important debates in both the corporate finance and financial intermediation literature. From a corporate finance perspective, our results add the financing source as an additional channel to firms’ liquidity risk and management. From a financial intermediation perspective, we highlight that bank and nonbank intermediation are linked through borrowers’ contingent liquidity demand. The conventional separation – banks specialize in revolving liquidity insurance while institutional investors specialize in term lending – abstracts from the fact that nonbank fragility can endogenously raise the probability and correlation of bank credit line drawdowns. We show that banks internalize this interaction when setting credit line terms and demonstrates that the growth of shadow banking can tighten, rather than expand, firms’ access to bank liquidity under stress.

1 Literature Review

Our paper relates to several 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](#), [Berlin et al. 2020](#), [Giannetti and Jang 2024](#), [Gustafson et al. 2021](#), [Blickle et al. 2020](#), [Cordell et al. 2023](#)). 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. [Irani et al. \(2021\)](#) and [Fleckenstein et al. \(2026\)](#), on the other hand, document an increase in fragility to market-wide stress because of the growth in nonbank lending due to elevated rollover risk and the cyclical associated with nonbank credit. [Bhardwaj et al. \(2025\)](#) find that shocks to the supply of capital of CLO investors is

a source of fragility for firms. We contribute to this literature by showing 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 receive fewer credit lines and find it more expensive to borrow through credit lines.

Another set of papers studies corporate liquidity management. Existing work emphasizes that firms trade off cash holdings against bank credit lines to manage liquidity risk, and that refinancing and rollover risk shape investment and real outcomes when shocks hit (Sufi 2009, Acharya et al. 2013); a related strand documents aggregate drawdowns of credit lines during widespread 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 (see also, Ippolito et al. (2016), Carletti et al. (2025)). Other papers document a “dash for cash” during the COVID-19 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. 2024, Greenwald 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 contribute to this literature by showing 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 lending competition for banks from nonbanks (e.g. Carey et al. 1998, Denis and Mihov 2003, Bruche et al. 2020, 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. 2024a,b, 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).⁷

⁷Anecdotal evidence indicates that private debt lenders commonly refinance middle-market loans initially provided by banks, particularly prior to covenant breaches or when borrowers approach distress. Banks reduce term loan lending and instead provide liquidity through (undrawn) credit lines, against fees and higher spreads. Overall, this anecdotal evidence is consistent with dual lending by banks and private debt

In addition, there is a large literature on rollover risk in bond markets and the implications for asset pricing and corporate finance. Building on theoretical models such as [He and Xiong \(2012\)](#), several papers document that illiquidity increases corporate bond spreads due to rollover risks (e.g., [Dick-Nielsen et al. 2012](#), [Friewald et al. 2012](#), [Nagler 2019](#)). [Almeida et al. \(2012\)](#) show that firms exposed to rollover risk during the global financial crisis experienced higher investment declines. [Choi et al. \(2018\)](#), [Parise \(2018\)](#), and [Xu \(2018\)](#) show that firms manage the size of their exposure to rollover risk. We contribute to this literature by showing that banks ex-ante take into account the rollover risk of firms financed by nonbanks (including bond market, nonbank loan market investors and private credit lenders) when providing credit line commitments.

Finally, recent literature, e.g., [Acharya et al. \(2026a\)](#), [Acharya et al. \(2026b\)](#), [Chernenko et al. \(2025\)](#), [Mistopoulou and Steffen \(2026\)](#) and [Rintamäki and Steffen \(2026\)](#), 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. \(2026\)](#)), 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 Data and Summary Statistics

Our setting is the U.S. syndicated loan market, where a lead arranger structures a loan package and distributes its facilities to banks and nonbank investors along segmented lines: banks retain revolving credit lines and amortizing Term Loan A (TLA) tranches on balance sheet, while nonbanks – chiefly collateralized loan obligations (CLOs) and loan mutual funds – hold the longer-maturity, bullet-repayment Term Loan B (TLB) tranches that arrangers originate and sell into the secondary market soon after closing ([Fleckenstein et al. 2026](#)). TLB is now the dominant form of term financing, and although nonbank funding is cheaper

funds to, on average, riskier borrowers.

than comparable bank debt in normal times – on the order of 100 basis points (Ivashina and Sun (2011), Appendix Figure OA2) – its supply is highly cyclical, contracting in aggregate stress as the discount narrows or reverses and firms rotate back toward bank credit. This cyclicity is central to our analysis because TLB’s bullet structure exposes nonbank-reliant borrowers to rollover risk precisely when market funding is scarce. The central question we take to the data is whether reliance on cyclical nonbank funding raises the systematic drawdown risk banks must underwrite, leading them to ration and reprice credit lines *ex ante*. To investigate this, we use different data sources, which we describe below.

2.1 Data

Loan data. We obtain data on new originations of syndicated loans from Refinitiv DealScan. We focus on syndicated loans originated, amended, and refinanced in the United States to non-financial companies between 2000 and 2024. Each origination and amendment is considered a new facility.⁸ We obtain secondary market loan prices from the Loan Syndication and Trading Association (LSTA).

Company data. To obtain borrower financial information, including credit ratings and credit line drawdown, we merge the borrowers in Dealscan to Compustat and CapitalIQ via the legacy Dealscan version using the link provided by WRDS and the augmented Dealscan-Compustat link file provided by Chava and Roberts (2008). Roughly 30% of the facilities in DealScan are public firms we can match to the Compustat data. We use CapitalIQ to track firm credit line drawdowns on a quarterly basis (daily during COVID-19). Stock returns are from CRSP. We further obtain corporate bond issuances and outstanding amounts from the Mergent Fixed Income Securities Database (FISD).

CLO data. We obtain CLO portfolio holdings and CLO secondary-market trading activity from Refinitiv LPC’s Collateral Trustee and Trading Trustee data, which are compiled from the monthly reports that CLO trustees file with their investors. We use the holdings to measure each CLO’s portfolio share in oil-and-gas borrowers – and hence each borrower’s indirect exposure to the oil shock through the CLOs that hold its loans – and the trading data to examine CLO secondary-market sales during the shock. CLO tranche structure and the overcollateralization and coverage-test results used in our constraint-mechanism tests are obtained from Creditflux, which captures the near-universe of CLO tranches since 2005. We merge Refinitiv’s CLO data to Creditflux through a name match.

Bank data. We measure the balance-sheet strength of the banks that arrange and provide credit lines using the consolidated regulatory filings of bank holding companies (the

⁸This is in line with existing literature Fleckenstein et al. (2026) and the legacy DealScan.

FR Y-9C “Call Reports”). For each lender we construct the Tier 1 risk-based capital ratio and a liquidity ratio (liquid assets, net of MBS/ABS, scaled by total assets), and we match DealScan lead arrangers to their bank holding company using RSSD identifiers from the Federal Reserve’s National Information Center.

Macro data. We draw on several macroeconomic time series. The spot price of West Texas Intermediate (WTI) crude oil and the NBER recession dates are obtained from FRED. To absorb mechanical comovement between bank health and energy or interest-rate shocks, we construct pre-shock bank risk controls following [Acharya et al. \(2024\)](#) using returns on the S&P 500 (SPY), the change in the ten-year Treasury yield (ΔTNX , from FRED’s DGS10), and sector exchange-traded fund returns for energy (XLE and XOP) and banks (KBE). For credit-cycle robustness, we additionally use the excess bond premium of Gilchrist and Zakrajšek (2012).

All variables used in the paper are described in Online Appendix Table OA1.

2.2 *Nonbank Dependence*

We define *Nonbank Dependence* as the share of total term loans of the borrower that are financed by nonbanks (TLB) at a given point. 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”...“Term Loan K” 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.⁹ Since DealScan only has loan origination information, we back out the information on loan outstanding from the loan-level data. Specifically, we track each loan from origination to maturity through any amendment, refinancing, etc. to identify the current size and maturity of each loan that is still active. We plot *Nonbank Dependence* in Figure 2. 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 dependence increased significantly in the early 2000s. 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.

⁹This 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 2026](#))

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 Online Appendix Figure OA3 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 Online Appendix Figure OA3 plots the time-series of nonbank shares and nonbank dependence using all three different nonbank loan classifications. While the first alternative measure (tagging unclassified term loans as nonbank term loan) does not exhibit much variation, the second alternative measure (term loan classification based on pro-rata) and our preferred measure (tagging unclassified term loans as bank term loans) closely follow each other. Table OA3 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.

2.3 Summary Statistics

Table 1 presents the summary statistics. We present the descriptive statistics for all borrowers as well as 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 76% of its term loans from nonbanks. The average firm has about \$12.1 billion in assets, with smaller borrowers being bank reliant relative to nonbank borrowers (\$11.87 bil. vs. \$13.08 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 60% of these borrowers having no credit rating while only 41% of nonbank borrowers are unrated.¹⁰

Credit lines are a common source of liquidity for borrowers. 94% of borrower-quarter pairs have access to credit lines, with the occurrence slightly higher for bank borrowers relative to nonbank borrowers (95% vs. 91%). However, when we compare the size of credit

¹⁰If we focus on ratings at the time of issuance, TLBs have a much higher likelihood of being rated (either in the quarter of issuance or previous quarter) compared to bank loan borrowers (71% vs. 56%). The fraction increases if one looks at loan-level rather than firm-level ratings. This also lines up with conventional wisdom that CLOs require borrowers to have ratings to invest in their loans.

lines as a share of total loans to the borrower, bank borrowers have a significantly higher share. Bank borrowers have about 84% of their total credit in the form of credit lines relative to 37% for nonbank borrowers. Firms also get 68% of their liquidity in the form of credit lines. Bank borrowers are able to borrow credit lines at much cheaper rates (drawn spread 163 vs 241 bps; undrawn spread 27 vs 42 bps). Overall, nonbank borrowers have slightly larger dollar amounts of credit lines drawdown (\$109 mil vs. \$107 mil) but significantly lower total credit line commitment, on average, than bank borrowers (\$574 mil. vs. \$756 mil.), even though they are larger on average. Even though the average level of credit line utilization is lower at nonbank borrowers (19% compared to 22% at banks), Figure 1 shows that nonbank borrowers drawdown more during aggregate stress episodes.

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.

3 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 4).

3.1 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:

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

where $y_{i,j,t}$ is either the volume or spread on newly issued credit lines to borrower i in industry j with credit rating r in quarter t . *Nonbank Dependence* is the share of total term loans financed by nonbanks. We measure both $y_{i,j,t}$ and *Nonbank Dependence* contemporaneously, as banks assess a firm’s overall reliance on nonbank financing at the time a credit line is issued.¹¹ Under the null hypothesis, where nonbank dependence does not affect the

¹¹Using contemporaneous measures rather than lagged variables does not pose significant concerns in our context, as nonbank dependence is measured as a stock rather than a flow variable. Additionally, credit lines and term loans are typically issued concurrently within the same financing deal, minimizing any timing discrepancies between issuances. Nevertheless, as a robustness check, we repeat our analysis using one-period lagged explanatory variables and find qualitatively similar results.

provision of bank credit lines to a firm, these coefficients should be zero. Our central hypothesis is that nonbank dependence affects the rollover risk of firms, which banks take into account in their provision of credit lines to a firm, so 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).

The unit of observation is the borrower $\times$ year-quarter level. 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 ($\pi_r \times \lambda_t$) fixed effects. In addition, we control for key firm and loan-level variables ($\mathbf{X}_{i,t}$)—size, leverage, loan maturity, deal purpose, and whether the credit line is secured—to isolate the incremental impact of *Nonbank Dependence*.¹² Standard errors are clustered at the borrower level. Rating $\times$ year-quarter FEs absorb time-varying credit supply conditions common to borrowers of similar creditworthiness.¹³ Borrower FE (δ_i) absorbs all time-invariant firm characteristics including unobservable credit quality, so the coefficient is identified from within-firm changes in nonbank dependence.¹⁴

3.2 Results

Descriptive analysis. We begin by exploring the relationship between credit line availability and pricing, and nonbank funding in Figure 3. Panel A plots credit line volumes against nonbank dependence: the left chart measures credit line availability (CL) as the volume of credit lines relative to Total Loan Volume (credit lines + bank term loans + nonbank term loans), while the right chart plots credit lines as a fraction of available liquidity, defined as $CL + Cash$ (Sufi 2009, Acharya et al. 2013, Disatnik et al. 2013). Panel B plots the all-in-drawn and all-in-undrawn spreads of newly issued credit lines against nonbank dependence.

After controlling for borrower- and time-specific fixed effects, both panels show a consistent pattern: greater nonbank dependence is associated with both lower credit line volumes and higher credit line spreads. Firms with high nonbank reliance use fewer bank credit lines (whether scaled by total borrowing or total liquidity) and pay more on both the drawn and undrawn portions when they do obtain credit lines. Together, the figures suggest that nonbank-financed borrowers substitute away from bank-provided liquidity and pay a premium on what they do obtain, consistent with our hypothesis that banks scale back credit

¹²Interestingly, while about 97.5% of term loans are secured, only 42% of credit lines are flagged as secured in Dealscan.

¹³In our robustness tests, we exclude all unrated firms (the largest group of borrowers), and the results remain qualitatively unchanged. We report these results further below in this paper.

¹⁴Singleton borrowers (11% of the sample) are absorbed by the borrower FE and do not contribute to coefficient estimation. The remaining 89% of borrowers appear with multiple credit line issuances (median = 14), ensuring that within-borrower variation is the primary identification source.

line provision when borrowers carry heavier nonbank exposure.

Access to credit lines. We estimate Equation (1) using OLS and present the findings in Table 2.¹⁵ Panel A regresses the share of newly issued credit lines (CL) on the borrower’s nonbank dependence. In Columns (1) and (2), the dependent variable is $CL/Total\ Loans$; Columns (3) and (4) replace the denominator with $CL+Cash$. Columns (5)–(7) report three alternative measures of credit line volume: the log of credit line volume at issuance (where we focus on the absolute effect on the numerator, i.e., credit line volume without scaling), but also credit line volume scaled by firm assets, and credit line volume scaled by firm sales. Since nonbank borrowers differ systematically from bank borrowers (Table 1), we add controls for borrower size, leverage, rating, loan purpose, and maturity to all specifications.

In Column (1), a one-standard-deviation increase in nonbank exposure (0.34) reduces $CL/Total\ Loans$ by 7.9 ppt. Moving from all-bank to all-nonbank financing (a shift from 0 to 1 in nonbank dependence) lowers credit-line issuance by 23.1 ppt. In Column 2, after adding stronger fixed effects moving from fully bank-dependent to fully nonbank-dependent borrower cuts credit-line availability by 16.4 ppt.

Replacing the denominator with total liquid resources yields a similar pattern. In Column (3), a complete shift from bank- to nonbank-financed borrowing decreases the credit-line share of liquidity by 4.7 ppt, falling to 3.3 ppt in Column (4) after controlling for borrower 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.

Columns (5)–(7) confirm that this relationship is not an artifact of how we scale credit line volume. Whether we measure credit lines in logs (Column 5), scaled by firm assets (Column 6), or scaled by firm sales (Column 7), greater nonbank dependence is associated with significantly smaller credit lines. A complete shift from bank to nonbank financing lowers credit line volume by roughly 20% (Column 5), reduces credit lines scaled by assets by 2.7 ppt (Column 6), and reduces credit lines scaled by sales by 4.7 ppt (Column 7). The negative relationship between credit line availability and nonbank dependence is therefore robust across measurement choices.

Cost of Credit Lines. Having documented the negative relationship between credit-line volume and nonbank reliance, we now turn to the formal estimates of borrowing costs. Panel B of Table 2 quantifies the spreads previewed in Panel B of Figure 3. Column 1 and 2 show that moving from zero to full nonbank dependence increases the drawn and undrawn spread by 40.4 bps and 5.3 bps respectively —about 23% and 19% of their respective mean spreads.

¹⁵Online Appendix Table OA4 (Panels A through F) presents the results using alternate measures of nonbank dependence including amortization schedules for Term Loan A loans. All results are robust to these alternative measures.

There is no difference in the upfront or commitment fee paid by these borrowers (Columns 3 and 4) while the total cost of borrowing (Column 5) is higher for nonbank borrowers, though not statistically significant. 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). Columns 6 and 7 additionally document the cost of term loans for borrowers as a function of their nonbank dependence. Unsurprisingly, nonbank borrowers pay significantly lower spreads on nonbank loans (TLB) and higher spread on bank loans (TLA), both even after including all controls.

3.3 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 2025), 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, Panel C of Table 2 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). We specifically focus on the presence of covenants for minimum interest coverage ratio (Column 1), covenants restricting capital expenditure (Column 2), if a cash sweep is part of the credit agreement wherein there is a requirement that cash proceeds from certain activities (e.g., asset sales) are used to repay debt (Column 3). Column 4 looks at whether there are any material restrictions in the contract. Finally, in Column 5 and 6, we look at the existence of performance or capital based covenants as in Christensen and Nikolaev (2012). 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. These include: leverage, debt to tangible net worth, and senior debt leverage ratio.

Our results show that nonbank dependent borrowers are more likely to have cash sweep covenants. However, they have a lower likelihood of capital based covenants. This lines up with the argument in Christensen and Nikolaev (2012) that capital covenants are used when there is ex-ante interest alignment, which is efficient when lender and borrower cannot

contract well on performance but can rely on monitoring based on private information or relationship lending. Nonbank borrowers may also prefer to have flexibility in capital structure decisions, and may have more transparent, public information relative to bank borrowers, reducing their incentives to agree to capital based covenants.

We then extend our analysis beyond the presence of covenants to covenant violation *thresholds* — the actual financial ratio limits specified in the underlying loan contracts. Using DealScan financial covenant text fields, we parse the initial threshold values for each covenant type and regress them on nonbank dependence (Table 2, Panel D), keeping borrower fixed effects so the variation comes from changes in a given firm’s nonbank dependence over time. On the extensive margin, when a borrower’s nonbank dependence rises, contracts are 4.4 percentage points less likely to include a maximum Debt/EBITDA covenant (Column 1) and 3.5 percentage points less likely to include a fixed charge coverage covenant (Column 3), both significant at the 5% level; the probability of an ICR covenant (Column 2) is unchanged. Conditional on the covenant being written, threshold tightness is largely insensitive to within-borrower changes in nonbank dependence: maximum Debt/EBITDA, minimum ICR, and capex/assets caps (Columns 4, 5, 7) are all statistically indistinguishable from zero. The only directional evidence of tighter terms (at the 10% level) is a higher minimum fixed charge coverage covenant (FCC; EBITDA over fixed charges such as interest, scheduled principal, and leases) threshold (+0.21 on a base of 1.51, Column 6) and a higher mandatory cash-flow sweep percentage (+12.2 percentage points on a base of 41%, Column 8). Sample sizes for threshold regressions are smaller than for presence indicators because DealScan coverage of parsed threshold values is limited and within-borrower variation in the numeric levels is modest. Taken together, Panels C and D suggest that banks do not respond to higher nonbank dependence by tightening trip-wire financial-ratio covenants; where they impose stricter terms, they do so primarily through cash-flow sweep mechanisms, consistent with monitoring via ex-post cash appropriation rather than ex-ante restriction on financial ratios. On balance, it also does not appear that nonbank borrowers have, uniformly, weaker covenants that could explain higher pricing on credit lines.

3.4 *Alternative hypotheses and discussion*

Our results are robust to a variety of alternative interpretations.

Bank–Firm Relationships. A lack of banking relationships might explain why nonbank-funded borrowers get fewer credit lines. We move to a bank $\times$ borrower $\times$ quarter panel and include a relationship strength control — the share of a borrower’s total lending from a given bank over the past three years. Columns 1 and 4 of Panel A of Table 3 report the baseline

volume and spread regressions in this panel. 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 rather than credit lines (Fleckenstein et al. (2026), Kashyap et al. (2002)). This would suggest a negative correlation between TLB occurrence and CL issuance, but due to bank business model rather than borrower financing conditions. Thus, we include bank-time fixed effects in Columns 2 and 5 of Panel A, 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.

Compositional Effects. To isolate changes to credit lines as a borrower’s own nonbank financing changes, Columns 3 and 6 of Panel A further include bank-borrower fixed effects, comparing changes in nonbank funding within the same bank-firm relationship over time. An increase from 0 to 1 in nonbank dependence now reduces credit-line volume by 11.7 ppt and raises spreads by 24.9 bps — attenuated relative to the baseline but still highly significant, confirming that the effect is identified from within-relationship variation in borrower nonbank dependence rather than across-borrower selection. In unreported results, we show that all results in Panel A of Table 3 are robust to measuring the volume of credit lines by amount at issuance instead as shares of total lending.

Systemic Risk. One alternate concern is that the reason nonbank borrowers see lower credit line availability is due to higher systemic risk of these borrowers. If these borrowers have higher betas, implying that they would fare worse precisely when the market and banks suffer, that could reduce bank credit supply. To test this, we calculate firm market betas based on stock returns for each borrower in our sample. We include this as a control in Column 1 of Panels B, C, and D of Table 3. We see that nonbank dependence continues to matter, over and above any systemic risk concerns: controlling for the firm’s market beta leaves the effect intact. What banks price is therefore the cyclicity of a firm’s financiers, not the firm’s own cyclicity. Thus, our result is not a relabeling of standard risk pricing.

Debt Maturity Profile. A related concern is that nonbank dependence might coincide with a firm’s own rollover risk: if nonbank-dependent borrowers simply carry more near-term debt, banks could be responding to that maturity profile directly, independent of who holds the term loans. Controlling for the borrower’s short-term debt share (Column 2 of Panels B, C, and D) leaves the effect essentially unchanged — a full shift to nonbank dependence still lowers credit-line volume by 23 log points, and by 16.5 ppt as a share of total loans, and raises the drawn spread by 43.1 bps — and the short-term debt share itself is insignificant.

Covenant Selection. Because bank credit lines carry stronger covenants than nonbank

term loans (Ivashina and Vallee 2025), nonbank-dependent borrowers might demand fewer credit lines to avoid covenant-heavy contracts, a demand-side rather than supply-side story. Controlling for the number of financial covenants on the deal (Column 3 of Panels B, C, and D) again leaves the effect intact (16.7 ppt and 21.8 ppt on volume depending on how it is measured and 39.2 bps on spreads).

Switcher Analysis. To further address the concern that bank and nonbank borrowers differ on unobservable characteristics, we identify “switcher” firms that are observed on both sides of the nonbank dependence margin at different points in time. Column 4 of Panels B, C, and D of Table 3 restrict to this subsample, using only within-firm variation in nonbank dependence over time. The effect remains strong, ruling out time-invariant borrower-type differences as the driver.

Bank Regulation. Next, 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, but not necessarily more nonbank term loans. Column 5 of Panels B, C, and D of Table 3 restrict the sample to positive-EBITDA firms. 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.

Credit Quality. Finally, because a majority of borrowers are unrated and therefore share a single rating $\times$ year-quarter bucket, credit quality is less tightly controlled for a large part of the sample. We re-estimate on rated borrowers only, for whom the rating $\times$ year-quarter fixed effects fully absorb time-varying credit quality (Column 6 of Panels B, C, and D); the effect attenuates modestly but remains highly significant (12.8 ppt on credit line shares, 24.7 ppt on absolute volume, and 31.8 bps on spreads).

Other Robustness. Lastly, we run robustness tests to check whether the results are driven by specific time periods or borrowers. For example, the lack of credit lines to nonbank borrowers is not driven by unrated borrowers, borrowers with only term loans, or crisis periods. Online Appendix Table OA5 reports quantitatively similar effects when restricting to unrated borrowers (Cols 1 and 4), to borrowers with positive term-loan balances (Cols 2 and 5), and to non-crisis time periods (Cols 3 and 6). Online Appendix Figure OA4 additionally shows that Non-IG and unrated firms have significantly higher credit line drawdowns.

Overall, nonbank dependence negatively correlates with bank-provided liquidity, even controlling for selection at the bank or borrower level. This reinforces our conclusion that firms tapping nonbank markets face constraints when seeking bank credit lines.

Time-series evidence. If banks adjust liquidity supply in response to changes in firms’

reliance on nonbank funding, we would expect liquidity provision to exhibit greater cyclical-ity over time for firms with higher dependence on nonbank financing. To examine this, we plot the time-series of credit lines (as a percentage of total loans) in Online Appendix Figure OA5. Consistent with our hypothesis, the figure shows that firms more reliant on nonbank funding experience stronger cyclical-ity in the availability of credit lines. Moreover, if borrowers have fewer credit lines available for their liquidity management, we would expect to see higher and more cyclical cash holdings. Online Appendix Figure OA6 shows this is indeed the case.

3.5 Bank Balance Sheet Constraints

The preceding results establish that nonbank dependence correlates with reduced credit line access and higher spreads, even after accounting for a range of alternative explanations. A natural question is whether this operates through bank balance sheet constraints, as the mechanism implies. If banks internalize the systematic drawdown risk of nonbank-dependent borrowers, the effect should be amplified when banks themselves have lower capital buffers or less liquidity. We test this directly by interacting nonbank dependence with bank-level capital and liquidity measures from BHC Call Reports.

Specification. We estimate the interaction at the bank $\times$ borrower $\times$ quarter level on credit lines outstanding. For each bank b in quarter t , we construct two measures from the FR Y-9C: the Tier 1 risk-based capital ratio (*Tier 1*), and the liquidity ratio defined as liquid assets net of MBS/ABS over total assets (*Liq*). We match each DealScan lender (*lenderid*) to its BHC (*rssd9348*) and merge the quarterly bank measure. All three measures are winsorized at the 1% level and standardized (mean 0, s.d. 1) in the regression sample. The estimating equation is:

$$Y_{b,i,t} = \beta_1 \text{NB Dep}_{i,t} + \beta_2 \text{BS}_{b,t}^{std} + \beta_3 (\text{NB Dep}_{i,t} \times \text{BS}_{b,t}^{std}) + \gamma' X_{i,t} + \alpha_i + \alpha_b + \alpha_{r,t} + \alpha_{s,t} + \varepsilon_{b,i,t}, \quad (2)$$

where $Y_{b,i,t}$ is either the log of credit line outstanding from bank b to borrower i in quarter t or the all-in-drawn spread (bps); $\text{NB Dep}_{i,t}$ is borrower i 's share of nonbank term loans in total term loans outstanding; $\text{BS}_{b,t}^{std}$ is one of our two standardized bank balance-sheet measures; $X_{i,t}$ stacks borrower controls (log assets, debt-to-assets, remaining maturity of CL, and a secured-CL indicator); and α_i , α_b , $\alpha_{r,t}$, $\alpha_{s,t}$ are borrower, bank, rating $\times$ year-quarter, and 2-digit SIC $\times$ year-quarter fixed effects. Standard errors are clustered at the borrower level. The coefficient of interest, β_3 , captures how a one-standard-deviation increase in the bank's balance-sheet measure shifts the slope of credit line terms on borrower nonbank dependence.

Results. Table 4 reports the results using Tier 1 capital (Columns 1, 3) and the liquidity

ratio (Columns 2, 4). For CL volume, a one-standard-deviation increase in bank Tier 1 capital *attenuates* the nonbank dependence effect on log CL outstanding by about half (Column 1). For spreads, the interaction is negative and significant (Column 3): better-capitalized banks charge a smaller spread premium to nonbank-dependent borrowers. We estimate the same specification using the bank’s standardized liquidity ratio. The NB Dep $\times$ Liquidity interaction for CL outstanding suggests more liquid banks provide larger credit lines to nonbank-dependent borrowers (Column 2). The spread interaction is small and insignificant, suggesting the liquidity channel operates primarily through the volumes (Column 4).

Together, these results provide direct evidence for the proposed mechanism: banks that are better positioned to absorb the systematic drawdown risk associated with nonbank dependence (those with higher capital and liquidity buffers) attenuate the negative effect on credit line access.

4 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 like to 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.

4.1 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 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 (Online Appendix Figure OA7, Panel A). By early 2015, weakening demand and a strengthening U.S. dollar deepened the downturn, pushing oil prices about 70% below their mid-2014 peak.¹⁶

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.

¹⁶We address the confounding effects of potentially weaker borrower demand in our analysis.

Indeed, while energy sector stocks declined by roughly 9% in 2014, the broader equity market (S&P 500) remained relatively stable through early 2016 (Online Appendix Figure OA7, Panel A). In contrast, the leveraged loan market was severely affected: secondary market prices declined over 10%, driven by a larger than 20% drop in oil and gas loans (Panel B). 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 (Online Appendix Figure OA8, 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, whereas bank-provided term loans and credit lines remained comparatively stable or even rose slightly (Panel B).

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.

4.2 Methodology

To investigate how banks respond to an exogenous episode of rollover risk, 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 drop in portfolio value, and thus curtailed new TLB originations and rollover of existing TLBs more sharply. We exclude all firms from the O&G industry, which were directly affected by the shock. The remaining firms may have been exposed to the shock *indirectly*, because some of their loans were held by CLOs exposed to O&G firms. Table 5 compares characteristics of firms with high and low oil-gas exposure in our sample. Moreover, these firms are only affected if they have maturing TLBs during the shock period and thus face rollover risks (Giannetti and Meisenzahl 2023).¹⁷ Our key identifying assumption is that banks and non-O&G firms are otherwise unaffected by the

¹⁷Saunders 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.

shock. We discuss this assumption and other potential confounding events in Section 4.5.

We estimate the following difference-in-difference (DiD) specification using OLS:

$$y_{i,t} = \alpha + \beta \underbrace{\text{Oil-Gas Exposure}_i \times \text{Rollover Risk}_i}_{\text{Affected Firms}} \times \text{Post}_t + \lambda_t + \delta_i + \epsilon_{i,t} \quad (3)$$

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* is an indicator variable equal to one if a firm’s TLB matures during the shock window (which is also used to split the sample into a *Maturing TLB* vs. *Active TLB* sample). All regressions include borrower, industry, rating, and year-quarter fixed effects, with standard errors clustered at the borrower level.

Oil-Gas Exposure. To measure a firm’s exposure to the oil-price shock, we first calculate the share of each CLO’s portfolio in oil and gas firms as an average of loans held between January and of May 2014 (ending one month before the shock). Our sample has 687 CLOs with an average share of 3% of their portfolio in oil and gas firms. As in Kundu (2023), a firm’s exposure to the shock is constructed as the weighted-average O&G exposure across the CLOs that hold the firm’s loans (before the shock).¹⁸ Online Appendix Table OA6 compares CLO characteristics at 2014Q1 for the 309 CLOs with complete pre-shock characteristics by above- and below-median O&G exposure. The mean O&G portfolio share is 1.1% for low-exposure CLOs and 4.7% for high-exposure CLOs. The two groups are comparable on pre-shock observables, supporting the identifying assumption of our DiD setting that their post-shock divergence reflects the oil shock rather than selection on CLO quality. High-exposure CLOs entered the shock period with more loan in their portfolio and somewhat *healthier* on rating-based metrics, e.g. a lower share of CCC-rated collateral (4.1% vs. 9.7%) and fewer breaching the 7.5% CCC bucket (10.6% vs. 20.9%).¹⁹

Rollover Risk. *RolloverRisk_i* is an indicator variable equal to one if a firm’s TLB matures during the shock window. We treat each institutional term-loan tranche as a single facility and follow each facility from origination to the last amendment before the oil price shock period to measure its maturity right before the shock hit. This procedure ensures that the classification into “*Active TLBs*” vs “*Maturing TLBs*” reflects the borrower’s pre-

¹⁸Bhardwaj et al. (2025) show that CLO-borrower relationships are sticky.

¹⁹To illustrate how CLO behaviors diverged, Figure OA9 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.

shock contractual rollover schedule and is not mechanically affected by any refinancing the borrower undertakes in response to the shock itself. *Maturing TLBs* are borrowers with a nonbank loan originated before, and outstanding as of, 2014Q1 whose pre-shock maturity falls between 2014Q2 and 2015Q4 (the oil shock window). *Active TLBs* are borrowers whose pre-shock TLB maturity extends beyond the window (through 2016Q1 or later), implying no immediate refinancing pressure. Borrowers for whom a TLB’s maturity cannot be reliably determined are dropped from the sample. This separation parallels prior evidence that maturing debt during a crisis directly worsens firm outcomes (Almeida et al. 2012). Firms with non-maturing TLBs experience a reduction in further accumulation of nonbank credit, but do not face imminent rollover demands.²⁰

4.3 Results

Table 6 reports the results from running our DiD equation 3. Panel A of Table 6 shows the results for the full sample. Borrowers with maturing nonbank loans in CLOs more exposed to the oil shock experience a significant drop in new TLB issuance (Column (1)). A firm with one standard deviation higher exposure sees a 13.7% lower volume of TLB issuance. Correspondingly, in Column (2), these borrowers face a 11.2 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 unaffected from the shock. 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 8.8 ppts and spreads increasing by 17.7 bps relative to less exposed firms. Overall, Column (5) suggests that total term loan issuance volume drops by 19.4 ppt for high exposure borrowers with maturing nonbank loans.

Column (6) shows that new credit-line issuance per quarter (CL Vol., a flow measure) falls by 12.0% for maturing-TLB borrowers relative to active-TLB borrowers. Column (7) tracks the outstanding stock of credit lines (CL Out)—a borrower’s running balance of committed credit-line capacity across all live tranches, rather than new originations per quarter—and shows that the stock falls by 17.1% under the same triple interaction, mirroring the contraction on new issuance. Column (8) confirms that the same distressed borrowers pay 10.2 bps higher spreads on whatever credit lines they retain.²¹

²⁰For 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 existing 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.

²¹To verify that the *Maturing TLBs* classification is not just picking up borrowers that in general have

In line with this, Figure 4 documents that at the onset of the oil price shock, *Maturing TLB* borrowers saw a reduction in TLB volumes and paid higher spreads on them. At the same time, their credit line volumes fell and spreads increased. In contrast, the *Active TLB* sample see an increase in credit line volumes during the shock period. 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.

To further decompose these effects, we estimate the $Oil - GasExposure_i \times Post_t$ coefficient separately within the maturing TLB and active TLB subsamples. We report the results in Panel B of Table 6. Oil exposure reduces TLB issuance for *both* groups, reflecting a general contraction in the CLO-funded loan market. But the critical difference is in spreads and credit line access: maturing TLB firms face significantly higher spreads on TLBs (+8.8*), TLAs (+16.8**), and CLs (+11.7**), and experience substantial new CL contraction (−0.158***). Active TLB firms show *zero* spread effects across all loan types and only marginal new CL contraction (−0.045**). The spread channel — which directly reflects banks’ pricing of drawdown risk — is entirely specific to firms with rollover risk.

The asymmetry is even starker for the outstanding stock of credit lines in Column 7. *Maturing TLB* borrowers see CL Outstanding fall by 10.4% ($p < 0.05$), while *Active TLB* borrowers see CL Outstanding *rise* by 6.0% ($p < 0.05$). When their nonbank funding contracts, the active-TLB cohort actually accumulates more committed bank liquidity, whereas the maturing-TLB cohort loses bank liquidity at the same time. The flow measure in Column 6 (new CL issuance per quarter) is negative for both groups, so the opposite-signed stock effect for active-TLB borrowers cannot reflect larger new originations; we unpack the mechanism next.

Panel C of Table 6 decomposes each borrower’s outstanding stock in credit lines by the origination cohort of the underlying credit line tranche—pre-shock (originated on or before 2014Q1) versus post-shock—using the earliest origination date of each facility across all amendments to assign cohort. Column 1 reports the intensive margin on pre-shock CLs (log balance conditional on positive); Column 2 reports $\ln(1+CL)$ for the post-shock cohort; Column 3 reports the extensive margin on post-shock CLs (an indicator for any post-shock-originated balance). For *Active TLB* borrowers (top row), the +6% stock effect is driven entirely by the extensive margin on new originations: high-exposure firms are 3.8 ppt more

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 Online Appendix Figure OA11. 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.

likely to have any post-shock-originated CL (Col 3) and the post-shock cohort $\ln(1+CL)$ rises by 0.233 (Col 2), while the pre-shock cohort is flat (Cols 1).

For *Maturing TLB* borrowers (bottom row), the pattern reverses: there is no extensive expansion on new originations (Col 3), and the -10.4% stock effect comes from a contraction on the intensive margin of pre-shock credit lines. That is, high-exposure firms see their balance on pre-existing credit lines shrink by 10.1% (Col 1). Combined with the negative new-CL flow in Column 6 of Panel B, the cohort split reveals that the asymmetry on CL Outstanding reflects preservation of existing credit lines and continued (smaller) new originations for the active-TLB cohort, versus outright shrinkage of pre-shock credit lines with no offsetting new originations for the maturing-TLB cohort.

This decomposition also rules out an alternative “distribution-constraint” channel, whereby a lead arranger that cannot place a deal’s TLB tranche shrinks the entire bundled package, including the credit line. Active- and maturing-TLB borrowers are funded by the same oil-exposed CLOs and thus face the same placement friction, yet banks expand credit-line capacity for active-TLB borrowers while contracting the pre-existing lines of maturing-TLB borrowers — even though amending or upsizing an *existing* credit line requires no TLB distribution and is therefore unconstrained by CLO demand. Furthermore, this contraction is not due to a mechanical roll-off of expiring revolvers. Credit-line maturity is balanced across the two groups (Online Appendix Figure OA11) — yet the cohort decomposition shows the pre-shock balance contracts only for maturing-TLB borrowers while it is flat for active-TLB borrowers, and does so conditional on a positive balance, i.e., among active facilities. The divergence reflects an ex-ante rationing of liquidity according to the borrower’s rollover risk, not a mechanical inability to distribute nonbank tranches or credit line expiration.

4.4 Shock Transmission through CLOs

A natural question is as to why an even modest oil and gas exposure at the CLO level (a median portfolio share of roughly 3%) translates into meaningful adverse effects on borrower credit access. The answer lies in the non-linear structure of CLO portfolio covenants. CLOs must satisfy a battery of collateral-quality tests, most importantly, overcollateralization (OC) and interest-coverage (IC) tests against par-based thresholds. When O&G loans are downgraded or marked down during the shock, coverage cushions of CLOs holding these loans compress toward these thresholds, forcing broader portfolio adjustments — including sales of non-O&G collateral — that are disproportionate to the raw O&G portfolio share. We document this transmission in two steps.

First, oil exposure erodes CLO coverage cushions. Panel A of Table 7 reports CLO-level

cross-sectional regressions of the change in each coverage-test *cushion* – defined as the test result divided by its required threshold – between 2014Q1 and 2015Q4 on the CLO’s pre-shock O&G portfolio share. Greater oil exposure predicts significant deterioration in the junior OC cushion (-0.72 , $p < 0.05$) and the interest-coverage cushion (-9.37 , $p < 0.01$). The senior OC cushion—which carries the most over-collateralization and is therefore furthest from its trigger—compresses in the same direction but not significant ($p = 0.102$), the expected pattern given that the junior/mezzanine OC and interest-coverage tests bind first. Because these are minimum-coverage tests, the negative coefficients indicate that oil-exposed CLOs moved closer to their covenant triggers during the shock.

These cushion movements are large relative to how much slack CLOs carry, which is why a seemingly small O&G share might already be binding. Panel C of Table 7 reports the median pre-shock slack—each test’s distance to its trigger (cushion minus one). The median CLO enters the shock with only 0.053 of junior-OC slack and 0.318 of interest-coverage slack; applying the Panel A slopes to the median 3% O&G share implies a compression of 0.021 and 0.281, respectively—so a 3% exposure consumes roughly 40% of junior-OC slack and 88% of interest-coverage slack. Consistent with this, regressing the post-shock distance-to-trigger on O&G exposure shows that high-O&G CLOs end the window significantly closer to their junior-OC trigger (-0.31 , $t = -2.76$), despite having entered with *lower* CCC shares. The channel therefore operates through the par-based OC/IC tests rather than the CCC bucket, which is why the lower ex-ante CCC exposure of high-O&G CLOs does not insulate them.

Second, this covenant pressure shows up in the secondary market as fire sales of non-oil collateral. Following [Kundu \(2023\)](#), we examine secondary-market transactions in non-O&G loans over 2013–2015 and relate them to each loan’s *Oil-Gas Exposure* — the position-weighted average O&G portfolio share of the CLOs that hold them. Panel B of Table 7 shows that a loan held more heavily by oil-exposed CLOs trades at a significantly lower secondary price after the shock (-0.53 per \$100 of par with firm fixed effects, -0.44 with loan fixed effects) and is net-sold (net transaction volume of $-\$2.5$ million with firm fixed effects), even though the loan itself has no oil and gas exposure. The effect holds with both loan and firm fixed effects, indicating that it is not driven by borrower composition: the same lenders sell otherwise-similar loans at lower prices precisely when their portfolios are most exposed to the oil shock.

Together these results trace the full chain: the oil shock erodes the coverage cushions of oil-exposed CLOs, which respond by selling non-oil collateral (maybe even at fire-sale prices) to defend covenant compliance. This impairs their capacity to absorb new term-loan issuance and thereby raising the rollover risk faced by their borrowers. The rollover channel is specific to Maturing-TLB borrowers: with new CLO formation frozen during the shock

— and existing CLOs unable to purchase new loans outside their reinvestment periods — firms whose nonbank debt comes due cannot refinance it. Recognizing that these borrowers must instead draw on their committed lines precisely in a bad aggregate state, banks ration credit-line access *ex ante*.

4.5 *Alternative hypotheses and robustness - Oil price shock period*

In this section, we entertain different alternative explanations that can explain our results.

Leveraged Lending Guidelines (LLG). In March 2013, the OCC, the Federal Reserve, and the FDIC issued interagency guidance on leveraged lending, outlining minimum expectations for underwriting standards, risk management, and pipeline management of leveraged loans. The guidance was initially broad — it contained no specific numeric thresholds for what constitutes a leveraged loan, and it recognized that market participants use many alternative definitions (Kim et al. 2018). In response to inquiries, regulators issued important clarifications (a “Frequently Asked Questions” document) on November 7, 2014 — directly within our oil shock window (2014Q2–2015Q4).

Kim et al. (2018) provide three findings that are central to evaluating whether the LLG confounds our identification. First, banks did *not* respond to the initial March 2013 guidance; their leveraged lending activity actually increased in the year and a half after the guidance was issued. Banks’ response changed only after the November 2014 clarifications. Second, the response was concentrated among the largest, most systemically important banks – those in the Large Institution Supervision Coordinating Committee (LISCC). LISCC banks cut their leveraged lending significantly after the clarifications, bringing it below pre-guidance levels, but non-LISCC banks did not adjust their leveraged lending business even after the clarifications were issued.²² Third, after the clarifications, borrowers whose previous loan was from a LISCC bank became more likely to switch to nonbank lenders, but no similar switching occurred from non-LISCC banks.

These findings generate a sharp testable prediction: if the LLG is driving our credit line results, the effects should be concentrated at LISCC banks and among highly leveraged borrowers subject to enhanced scrutiny. Our CLO channel, by contrast, predicts that the effects should operate *regardless* of the supervising bank’s regulatory status or the borrower’s leverage, since the guidelines do not condition on whether a borrower’s CLOs hold oil and gas loans. The only reason CLO oil exposure should matter for credit line access is through the nonbank supply channel: oil shock increased CLO portfolio losses and reduced nonbank

²²Currently, 8 U.S. banks are included in the LISCC program: Bank of America, BNY Mellon, Citigroup, Goldman Sachs, JP Morgan Chase, Morgan Stanley, State Street, and Wells Fargo.

credit supply leading to higher rollover risk for more exposed borrowers, as a result of which banks curtail liquidity provision. We exploit this distinction through a series of progressively restrictive tests, each isolating to borrowers and banks where the LLG should have the least bite.

Panel A of Table 8 reports the triple-DID results splitting the sample by *LISCC* and *non-LISCC banks*. The effects remain significant even in the non-LISCC sample, the institutions that [Kim et al. \(2018\)](#) show did not adjust their leveraged lending even after the November 2014 clarifications. CL outstanding falling 21.4% and CL spreads increasing 10.5bps, with TLB volume falling. Since these banks did not respond to the guidance, the persistence of our results at non-LISCC banks cannot be attributed to regulatory tightening. Figure 5 presents the event-study analog at the bank $\times$ borrower $\times$ quarter level, plotting credit line volumes and spreads separately for LISCC and non-LISCC banks; the contraction in credit line outstanding and the widening of spreads for high-exposure borrowers with maturing TLBs is concentrated at non-LISCC banks, where LLG scrutiny is weakest.

Within *non-LISCC banks*, we further restrict to *low-leverage borrowers* (Debt/EBITDA below $6\times$), who fall well below the leverage threshold that triggers enhanced supervisory scrutiny. In this subsample, where neither the bank is subject to LLG enforcement nor the borrower to leverage-based restrictions, we continue to observe significant effects on credit lines: CL outstanding fall by 34% and CL spreads increase by 13.5 bps (Panel B of Table 8).

Figure 6 presents the event-study analogs at the bank $\times$ borrower $\times$ quarter level for this low-leverage, non-LISCC subsample. Panel A shows that maturing TLB borrowers with high oil exposure experience a sustained decline of 0.15 to 0.25 log points in CL outstanding post-shock, while Panel B shows the active TLB sample drifting positive. The confidence intervals are the tightest across all our tests, providing clean visual evidence that the CLO channel operates in a setting where leveraged lending regulation has no relevance.

Direct Bank Oil Exposure. Our key identifying assumption requires that the shock is orthogonal to banks. It could be that banks with direct lending exposure to oil-and-gas firms may have curtailed credit supply to all of their borrowers during the shock, so that our CLO oil-exposure measure could be capturing a bank-side credit-supply rather than the borrower-side rollover-risk channel. To address this, we add two sets of bank-side controls to our DID. First, *Bank O&G Exp.* $\times$ *Post* controls for each lending bank’s own outstanding portfolio share to Oil & Gas borrowers (SIC 13), standardized and interacted with *Post*. Second, following [Acharya et al. \(2024\)](#), we add bank- β controls — the interaction of each bank’s pre-shock (June 2011–May 2014) monthly stock-return beta to five factors (XLE, XOP, KBE, WTI, and Δ TNX) with the corresponding quarterly factor return — to absorb mechanical comovement of lender health with energy and rate shocks. Panel C of Table 8

reports the baseline triple interaction (Columns 1–4) alongside the specification with these controls (Columns 5–8). The $\text{Oil} \times \text{Post} \times \text{Mat TLB}$ coefficient is essentially unchanged. The direct bank O&G exposure control itself attracts a negative loading on TLB volume (consistent with a separate bank-side supply effect), but it leaves the borrower-level rollover channel intact — confirming that our results are not driven by banks’ own direct oil exposure.

Refinancing and Borrower Selection. Our identification strategy compares firms with maturing versus active TLBs. A concern is that firms with maturing TLBs at the shock onset are systematically lower quality — they could not, or did not, refinance before the shock, and this pre-existing weakness rather than rollover risk drives the results. We note that our sample construction dates each loan tranche by its *effective* maturity as of the shock — the maturity stated at the tranche’s most recent amendment dated before the shock — rather than its original contract maturity. This reflects any pre-shock refinancings or amendments while, by construction, excluding refinancing the borrower undertakes in response to the shock; the classification is therefore pre-determined and cannot be an artifact of the firm’s own post-shock refinancing behavior. We provide several additional tests to support this.

First, the results are robust to controlling for the pre-shock issuance gap (months since a firm’s last DealScan origination, interacted with Post) and to restricting the sample to firms with an active revolving credit line at 2014Q1, demonstrating pre-shock bank access (Online Appendix Tables OA7). Second, we split maturing TLB firms by whether they originated a *new* TLB in the two years before the shock (June 2012–June 2014), providing the most direct evidence of recent market access. Of 257 maturing TLB firms, 96 (37%) originated at least one new TLB in this window. If the results were driven by borrower weakness — firms that “could not refinance” — then these 96 firms with demonstrated market access should not be affected. Panel D of Table 8 shows the opposite: firms with recent TLB access experience a significant contraction in CL volume (−14.3%), while the no-access group shows a significant increase in CL spreads (+13.9 bps). Both groups are affected. This suggests that the maturing TLB classification captures rollover risk exposure from standard contract terms reaching maturity, not a failure to refinance.

Nonbank Rollover, Not Generic Rollover Risk. A distinct concern is that our triple interaction may capture generic rollover risk — any debt maturing during market stress — rather than the cyclical nature of nonbank financing specifically. To separate the two, we run a placebo that defines rollover risk from *bank* term loans: among borrowers with a Term Loan A (TLA) outstanding at 2014Q1, we flag those with a TLA maturing during the shock window and re-estimate the triple interaction (Online Appendix Table OA8, Panel A). Because TLAs are held by banks rather than by cyclical nonbank investors, a maturing TLA does not carry the same level of rollover risk. Consistent with our interpretation, maturing-TLA

borrowers show no significant change in new credit-line issuance, outstanding credit lines, or credit-line spreads, in contrast to the sharp contraction experienced by maturing-TLB borrowers. A horse race that includes both maturity indicators in the same regression (Panel B) confirms the contrast: the maturing-TLB interaction remains significant for credit-line volume, outstanding stock, and spreads, while the maturing-TLA interaction is insignificant throughout. The effect is therefore specific to rollover risk in *nonbank* term funding, not to debt maturity per se.

Broader Macroeconomic Environment. While the initial decline in oil prices in mid-2014 was driven by supply factors — booming U.S. shale production and shifting OPEC policies — the oil price decline coincided with a broader deterioration in credit conditions. A growth slowdown in China throughout 2015 continued to depress commodity prices, and the weaker economic backdrop suggested that not only oil and gas firms were affected: high-yield bond spreads widened significantly during this period.²³ A natural concern, therefore, is that our CLO oil exposure measure proxies for this broader macroeconomic stress rather than an O&G-specific channel. If so, borrowers whose CLOs happen to have high O&G exposure might simply be more exposed to the general credit deterioration, and the reduced credit line access we document could reflect this broader stress rather than the CLO-specific channel we propose.

We address this concern by jointly absorbing industry-level macro forces and borrower-level cyclical. A borrower-level concern is that firms whose CLOs have high O&G exposure might be concentrated in cyclical industries that are disproportionately affected by the broader slowdown, or that within an industry, more cyclical firms are sorted into CLOs with higher O&G exposure. We address this directly by constructing two pre-shock borrower characteristics and interacting them with Post: (i) *pre-shock market beta*, estimated from monthly CRSP returns on the S&P 500 using only the three years before the shock (June 2011–May 2014), capturing the firm’s systematic risk exposure without contamination from the shock itself; and (ii) *foreign income scaled by assets* (Compustat `pifo/atq`, fiscal year 2013), capturing exposure to the China slowdown and international commodity markets.

A balance test at 2014Q1 reveals two important facts. First, high-O&G-exposure borrowers have significantly higher pre-shock betas ($t = 2.86$, $p = 0.005$) — confirming that these firms are indeed more cyclical. Second, however, high-O&G-exposure borrowers have significantly *lower* foreign income ($t = 2.43$, $p = 0.016$). Panel E of Table 8 reports the O&G coefficient as we progressively add controls. Adding pre-shock beta strengthens the O&G coefficient: beta acts as a positive confounder, since high-beta firms have higher O&G expo-

²³The issues spilled into the primary syndicated loan market, most notably with the failure to syndicate a \$6 billion loan for the Veritas buyout in November 2015, which significantly slowed primary market activity.

sure and independently face tighter credit, so controlling for beta isolates the CLO channel more cleanly. Adding foreign income leaves results essentially unchanged. The kitchen-sink specification with both controls shows that the O&G exposure effect is not driven by borrower-level cyclicalities, international exposure, or industry-specific macro shocks.

Differences between exposed and unexposed firms. A natural concern with the oil-shock design is that borrowers whose loans are held by high-oil-exposure CLOs differ from those in low-exposure CLOs along pre-shock dimensions that also predict refinancing stress. As Table 5 shows, high-exposure borrowers are more nonbank-dependent, more levered, hold less cash, and are somewhat larger before the shock. Borrower fixed effects absorb level differences, but not necessarily differential post-shock trends correlated with these traits.

To address this directly, we entropy-balance the two groups on five pre-shock (2014Q1) firm fundamentals — nonbank dependence, total debt/assets, cash/assets, log assets, and an unrated indicator — reweighting low-exposure borrowers so that the weighted mean of every covariate matches the high-exposure group.²⁴ Panel A of Appendix Table OA9 confirms that the reweighting eliminates the pre-shock imbalances: differences that are large and significant in the raw data (a 0.10 gap in nonbank dependence and a 0.13 gap in debt/assets, both significant at the 1% level) fall to essentially zero. Panel B then re-estimates the triple difference of Table 6. Restricting to the balanced sample without weights (Column 2) leaves every coefficient essentially unchanged from the full-sample baseline (Column 1), so sample composition plays no role. Applying the entropy weights (Column 3) leaves the results intact: new credit-line volume, credit-line spreads, and new term-loan volume are all stable or stronger, and credit-line outstanding remains negative and significant — attenuated but still economically large. The oil-shock effect on bank liquidity provision is therefore not an artifact of pre-shock differences in characteristics between high- and low-exposure borrowers.

Bank Balance Sheet Channel: Finally, we verify that this rationing operates through bank balance sheets *within* the oil-shock design. In Appendix Table OA10, we re-estimate the effect at the bank $\times$ borrower $\times$ quarter level with bank $\times$ quarter fixed effects, comparing high-rollover, high-CLO-exposure borrowers to otherwise-similar borrowers at the *same bank in the same quarter*—holding each bank’s own balance-sheet shock fixed. Banks cut credit-line outstanding (-16.5%) and raise drawn spreads ($+8.8$ bps) to their maturing high-exposure borrowers, and the repricing is concentrated among banks with low pre-shock liquidity and capital ($+9.3$ bps and 6.5 bps versus near zero at high-liquidity/ capital banks). This confirms the full-panel balance-sheet mechanism of Table 4 inside the quasi-experiment: constrained banks ration liquidity most when borrower rollover risk is highest.

²⁴We exclude pre-shock loan levels and spreads from the balancing set, since these are pre-shock realizations of the outcomes themselves and would mechanically absorb the variation the design exploits.

4.6 *Financial and Real Effects on Nonbank Dependent Borrowers*

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 1 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.

Borrower Outcomes. We examine how these liquidity constraints shape borrowers’ financial and real outcomes. 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 total invested capital (Column 4) decline. 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.

Debt and Equity Issuance. A natural question is whether firms with maturing TLBs substitute into alternative debt or equity financing when nonbank credit and bank credit lines contract simultaneously. We examine this using the same triple-DID specification with eight outcome variables: four debt measures (net long-term debt issuance/assets, change in long-term debt/assets, change in current debt/assets, log long-term debt) and four equity measures (change in book equity/assets, net equity issuance/assets, change in shares outstanding, log book equity). Online Appendix Table OA11 reports the results. All flow measures are precisely estimated zeros – firms with maturing TLBs do not offset the retrenchment through other funding channels. We do, however, see a decline in the stock of book equity (though it is not statistically significant) consistent with accumulated losses from reduced credit line access and higher borrowing costs. The absence of substitution strengthens the connection to the invested-capital results above: the “double whammy” of reduced nonbank and bank credit translates directly into real effects because firms cannot replace the lost funding.

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.

4.7 Can bank-dependent borrowers smooth out shocks during stress?

The previous section documents the double whammy of borrowers financed by nonbanks. An interesting question is whether bank dependent borrowers are better able to smooth out shocks during stress periods. We use the same sample period around the oil price shock (2012Q1 to 2016Q4) and do a difference-in-difference test, where the treatment group are nonbank dependent firms and control group firms are bank dependent firms. Our post (or treatment period) is again starting in 2014Q2.

Online Appendix Table OA12 shows the results for various outcome variables. During the oil-gas shock, borrowers that were nonbank dependent before the oil price declined did substantially worse compared to those that were more dependent on bank financing (bank-provided term loans or credit lines). More precisely, they were less likely to issue new credit lines, had fewer credit lines outstanding, they decreased in size (driven by declines in long-term investments, cash, and invested capital, all scaled by total assets) and they had to hold more cash as part of total liquidity. Taken together, these results are consistent with bank-dependent firms being better able to smooth out shocks during stress.

5 Lender Heterogeneity - Term Loans vs Bonds

In the previous sections, we defined nonbank dependence as borrower dependence on investors in the *syndicated term loan* market. Large U.S. firms, however, are frequently financed with a mix of bonds and loans, and in both instruments, nonbanks are the largest investor base. Importantly, firms dependent on either bonds, syndicated loans, or even private credit use their bank provided credit lines during stress periods (see, for example, [Acharya and Steffen \(2020\)](#) and [Haque et al. \(2024\)](#)). In this section, we test banks' response as to liquidity provisioning via credit lines to increasing dependence on nonbank finance from bond markets.

Descriptive analysis. We first investigate quarterly credit line drawdowns of firms in Figure 7. We focus on firms financed by TLB loans as well as bonds (*TLB + Bonds*), only TLBs (*TLB, No Bonds*) and those financed only with bonds (*Bonds, No TLB*). Drawdown rates differ both in levels as well as cyclical. Firms financed only with TLB exhibit higher drawdown rates followed by firms financed with TLBs and bonds. Firms only financed through bonds show the lowest and the least cyclical drawdown rates. This cross-source difference in cyclical is the systematic component of drawdown risk banks must underwrite: TLB-dependent borrowers draw most heavily exactly in bad aggregate states.

Sample Overlap. Bond borrowers tend to have higher ratings than borrowers with nonbank syndicated term loans (TLBs): in the investment grade buckets, a majority of firms

have bonds but no TLBs, while below investment grade the likelihood of TLBs increases, with a third of firms having TLBs but no bonds and a fifth having both. Online Appendix Table OA13 compares characteristics of bond, bank, and nonbank borrowers. Given the different sets of firms that issue bonds relative to TLBs, we conduct our analysis controlling for the risk rating (among other characteristics) of the borrowers.

Results. We estimate equation (1) including two new measures, which should isolate the effect of differential rollover risk between borrowers dependent on different forms of nonbank financing: (1) *Bond Dependence*, measured as total bonds outstanding as a share of total term loans and bonds outstanding, and (2) *TLB Share*, measured as the volume of nonbank term loans (TLB) outstanding as a share of total term loans and bonds outstanding. Table 10 reports the results for the full sample of public borrowers with either a nonbank syndicated loan or bond outstanding. We include the same fixed effects as in our earlier tests; the borrower fixed effects account for firms that have neither bond nor nonbank term loan exposure.

We find that firms with bond and TLB dependence have less access to liquidity insurance by banks relative to firms without nonbank dependence. They have fewer credit lines as part of their overall liquidity (including cash) and the effects are economically similar in magnitude. Notably, while a greater *TLB Share* is associated with higher revolver spreads and commitment fees, firms with elevated *Bond Dependence*, all else equal, obtain credit lines at lower spreads and fees relative to their bank-dependent peers. One plausible explanation is that bond-reliant companies may face comparatively less supply-side pressure as they have access to alternative short-term funding instruments (such as commercial paper), which reduces their demand for (potentially costlier) credit line borrowing.

Overall, banks react more strongly by reducing the supply of liquidity provision to firms financed by nonbanks in the term loan market compared to the bond market, in line with the higher rollover risk and credit line utilization of these borrowers.

6 Conclusion

Corporate credit markets have been transformed by the shift of term lending from banks to nonbank investors, while banks have remained the primary providers of revolving liquidity insurance. A natural question is whether this shift in term lending towards nonbanks affects the availability of bank liquidity. If banks can diversify and price drawdown risk, the identity of a firm’s term lenders should be largely orthogonal to banks’ ex-ante willingness to provide credit lines. We reject this null. Firms that rely more heavily on institutional term loans obtain smaller credit line commitments and pay higher spreads on both the drawn

and undrawn portions of their revolvers. The evidence is consistent with the alternative hypothesis that nonbank dependence increases the systematic component of future drawdown risk. We provide direct evidence for the bank balance sheet channel: better-capitalized and more liquid banks attenuate the negative effects of nonbank dependence on credit line access, confirming that drawdown risk matters most when banks are themselves constrained.

To sharpen identification, we exploit the 2014-2016 oil-price collapse as a plausibly exogenous increase in rollover risk in institutional term loan markets, transmitted through CLO managers' pre-shock exposures to oil-sector loans and the resulting contraction in CLO issuance. Among non-oil firms, banks expand liquidity provision to borrowers that reduce their reliance on nonbanks only when these borrowers do not face immediate refinancing needs. For firms with looming institutional maturities, banks instead reduce credit line access and widen spreads when nonbank funding pulls back. These differences have real consequences: borrowers forced to refinance during the shock experience weaker balance-sheet and real performance, despite drawing on existing lines.

A key takeaway is that investor heterogeneity matters for the interaction between non-bank term funding and bank liquidity insurance. The retrenchment in bank-provided liquidity is strongest when firms rely on institutional loan-market investors such as CLOs but weaker for bond financing. This pattern supports the conjecture that what matters for banks is not a borrower's nonbank share per se, but the cyclical and rollover risk embedded in its term-financing investor base. Composition, not just quantity, of market-based term funding shapes the fragility that spills over to banks' contingent liquidity exposures.

Our paper 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 types of nonbank exposures 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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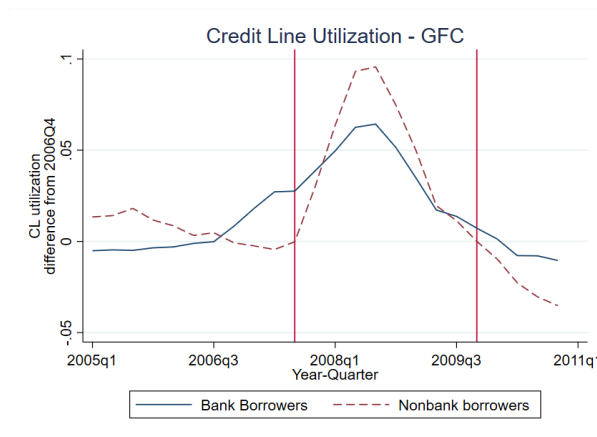
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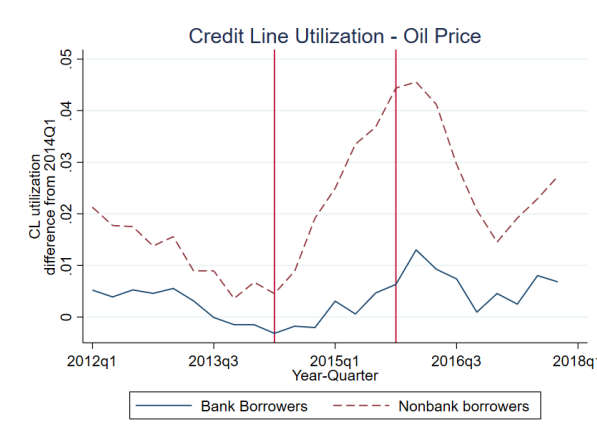
Figure 1: Borrower Credit Line Drawdown During Market Stress

This figure shows the average credit line utilization rate (drawn balance/ total committed balance) 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 at least one outstanding TLB as of the quarter before the shock. Data is from CapitalIQ.

Panel A - Global Financial Crisis



Panel B - Oil Price Shock



Panel C - COVID-19

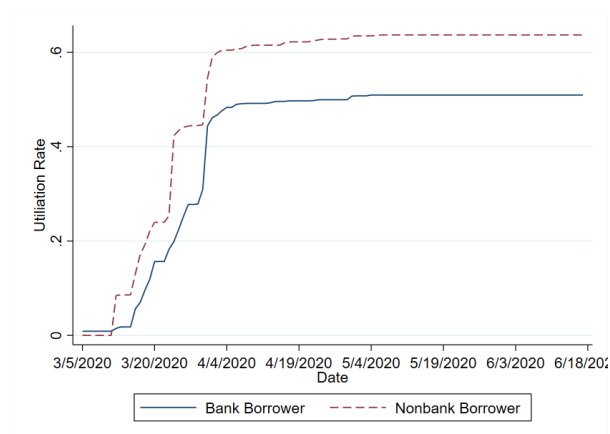
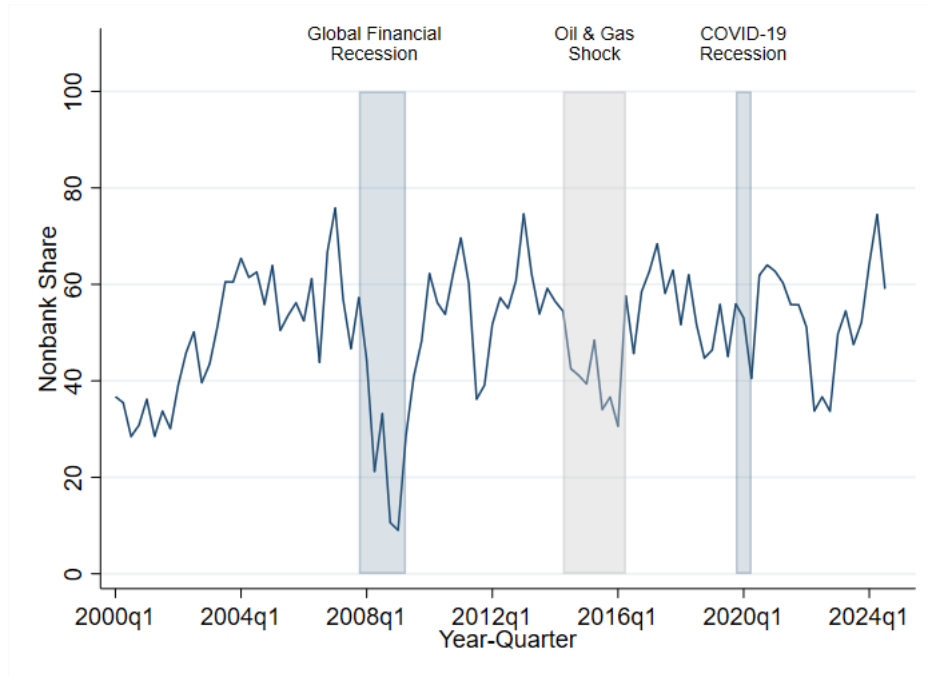


Figure 2: Nonbank Dependence

This figure plots Nonbank Share and Nonbank Dependence over the 2000 to 2024 period. *Nonbank Share* is the volume of nonbank term loans (TLB) originated as a share of total term loans originated in a given quarter. *Nonbank Dependence* is the volume of nonbank term loan outstanding as a share of total term loans outstanding. 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 outstanding loans

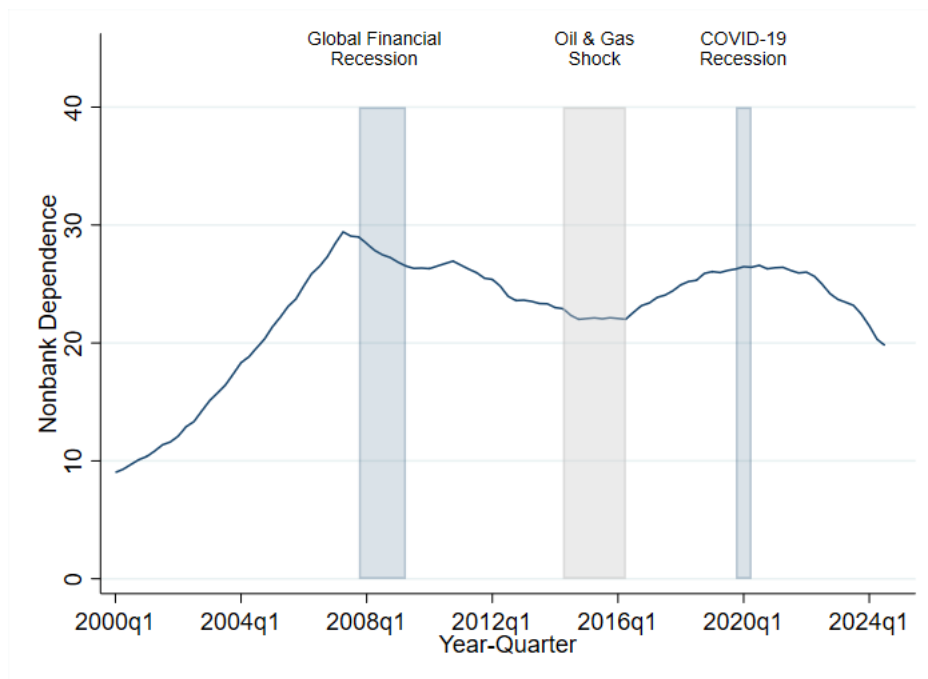
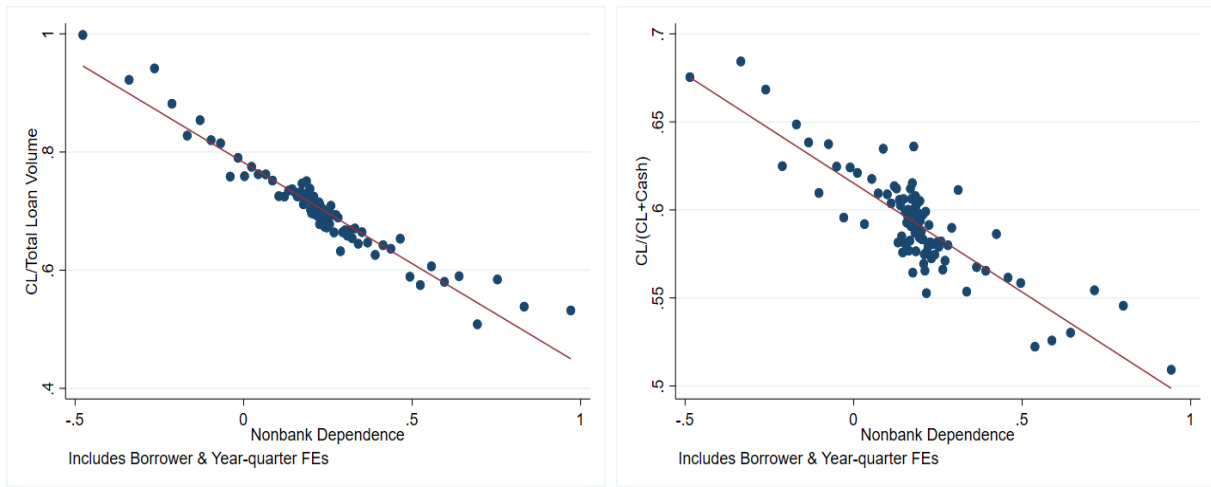


Figure 3: Volume and Cost of Credit Lines vs. Nonbank Dependence

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 2000Q1-2024Q4. In Panel A, we measure credit line outstanding as a share of total loans (credit lines + term loans) outstanding to the borrower and as a share of total liquidity (measured by cash plus credit lines). In Panel B, we measure the all-in-drawn and all-in-undrawn spreads of newly issued credit lines in the given quarter. *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 Shares



Panel B - Cost of New Credit Lines

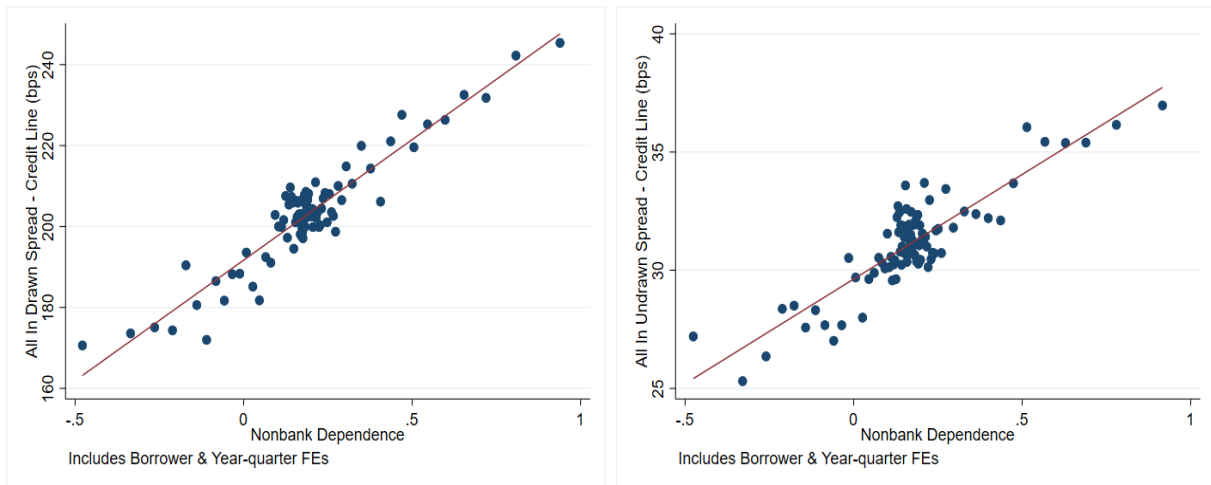


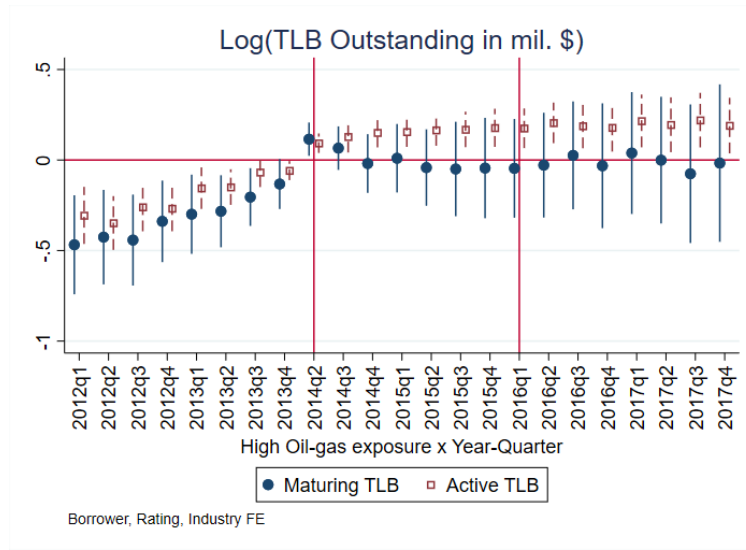
Figure 4: Borrower Term Loan and Credit Line Access Based on Loan Maturity

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

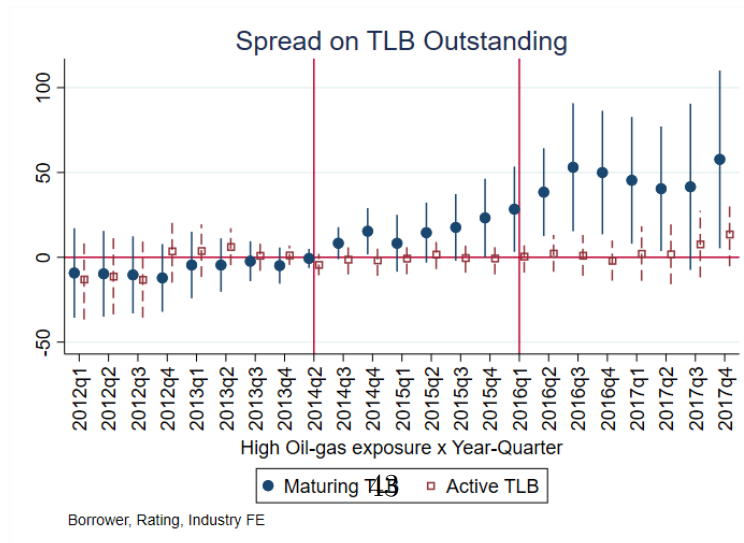
$$y_{i,t} = \alpha + \beta \text{High Oil-Gas Exposure}_i \times \mathbf{1}_t + \lambda_t + \delta_i + \epsilon_{i,t}$$

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 nonbank term loan (TLB) as of 2014Q1 and their TLBs are not maturing during the oil price shock of 2014Q2-2015Q4, and as *Maturing TLB* if their nonbank loans maturing during the shock window. Coefficients plotted are relative to 2014Q1. We include borrower fixed effects, rating, two-digit SIC code, and year-quarter fixed effects. Firms in oil-and-gas sector (SIC=13) are excluded. Standard errors are clustered at the borrower level and bars denote 90% confidence intervals.

Panel A -TLB Outstanding

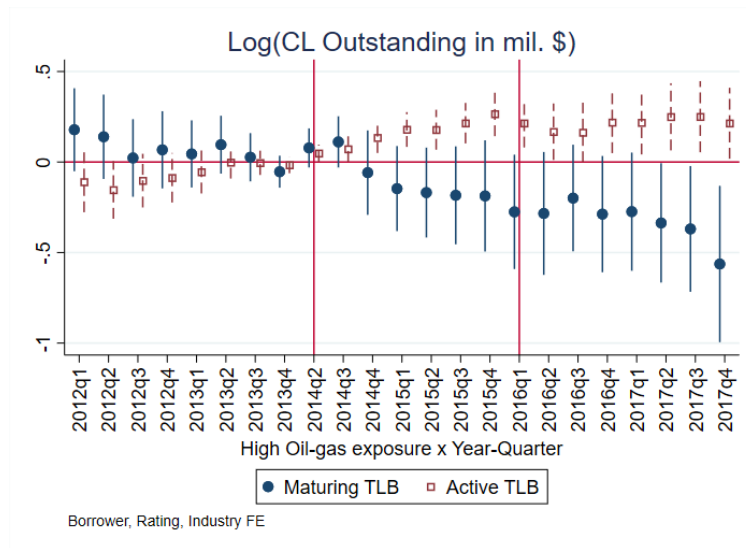


Panel B - TLB Spreads



Borrower Term Loan and Credit Line Access - continued

Panel C - Credit Line Outstanding



Panel D - Credit Line Spreads

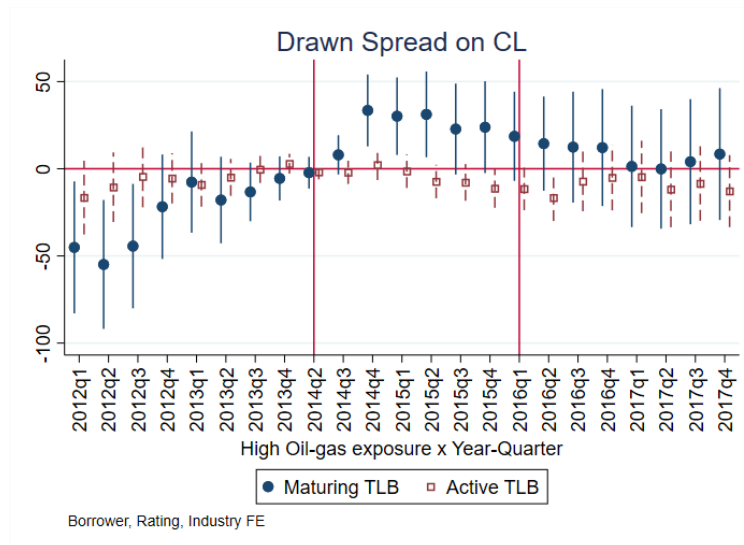


Figure 5: Event Study: CL Outstanding and Spreads by LISCC vs. Non-LISCC Banks

This figure plots the coefficients from the following regression around the oil price shock separately for LISCC and non-LISCC banks

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

where $y_{i,t}$ is the volume of credit lines outstanding (Panel A) and spreads on credit lines (Panel B) 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 nonbank term loan (TLB) as of 2014Q1 and their TLBs are not maturing during the oil price shock of 2014Q2-2015Q4, and as *Maturing TLB* if their nonbank loans maturing during the shock window. LISCC banks are the 8 institutions under the Fed's Large Institution Supervision Coordinating Committee (BoA, BNYM, Citi, Goldman, JPM, Morgan Stanley, State Street, Wells Fargo). Coefficients plotted are relative to 2014Q1. We include borrower fixed effects, rating, two-digit SIC code, and year-quarter fixed effects. Firms in oil-and-gas sector (SIC=13) are excluded. Standard errors are clustered at the borrower level and bars denote 90% confidence intervals.

Panel A - Credit Line Outstanding



Panel B - Credit Line Spreads

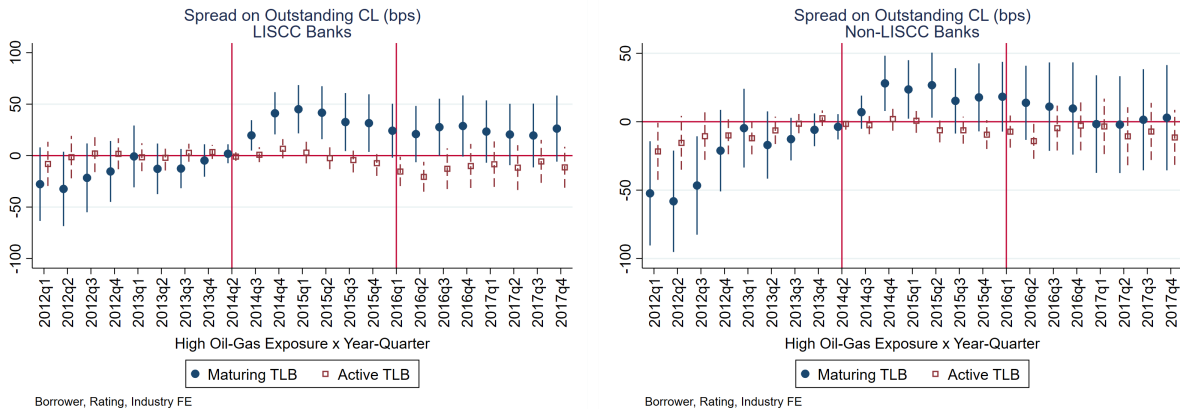


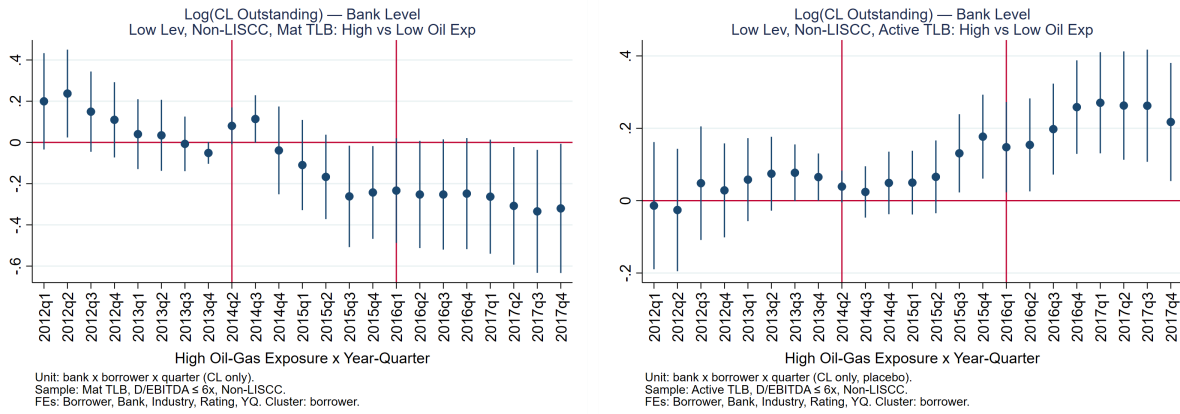
Figure 6: Bank-Level Event Study: Low-Leverage Borrowers at Non-LISCC Banks

This figure plots the coefficients from the following regression around the oil price shock separately for LISCC and non-LISCC banks

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

where $y_{i,b,t}$ is the volume of credit lines outstanding (Panel A) and spreads on credit lines (Panel B) for each borrower i from bank b 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 nonbank term loan (TLB) as of 2014Q1 and their TLBs are not maturing during the oil price shock of 2014Q2-2015Q4, and as *Maturing TLB* if their nonbank loans maturing during the shock window. Non-LISCC banks excludes the 8 institutions under the Fed's Large Institution Supervision Coordinating Committee (BoA, BNYM, Citi, Goldman, JPM, Morgan Stanley, State Street, Wells Fargo). Low-leverage borrowers are ones with Debt/EBITDA_t ≤ 6. Coefficients plotted are relative to 2014Q1. We include borrower fixed effects, rating, two-digit SIC code, and year-quarter fixed effects. Firms in oil-and-gas sector (SIC=13) are excluded. Standard errors are clustered at the borrower level and bars denote 90% confidence intervals.

Panel A - Credit Line Outstanding



Panel B - Credit Line Spreads

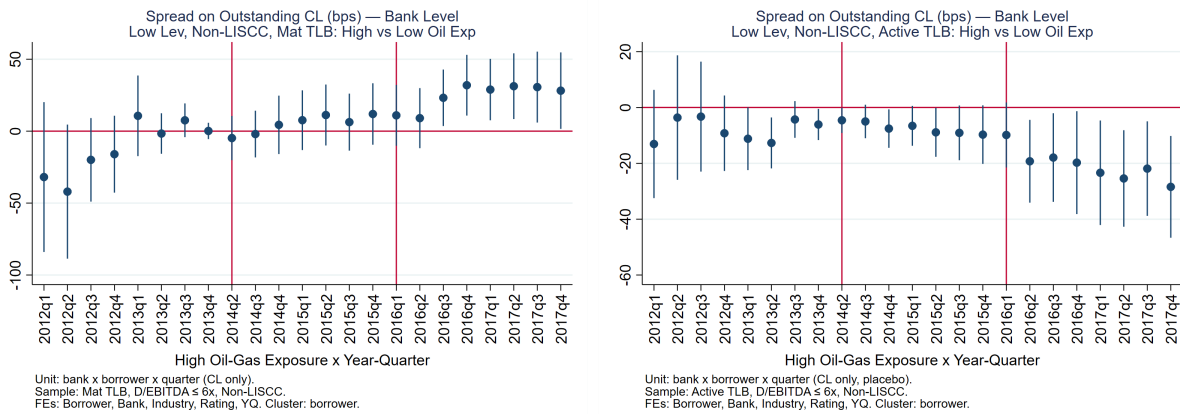


Figure 7: CL Drawdown by Nonbank Borrowers - TLB and Bond Borrowers

This figure shows the average credit line utilization rate (drawn balance/ total committed balance) of nonbank borrowers in the syndicated loan market and the bond market over time. Firms are classified as being *TLB Borrowers* if they have an outstanding Term Loan B-K (TLB). *Bond Borrowers* borrowers are ones with bond outstanding. Data is from CapitalIQ.

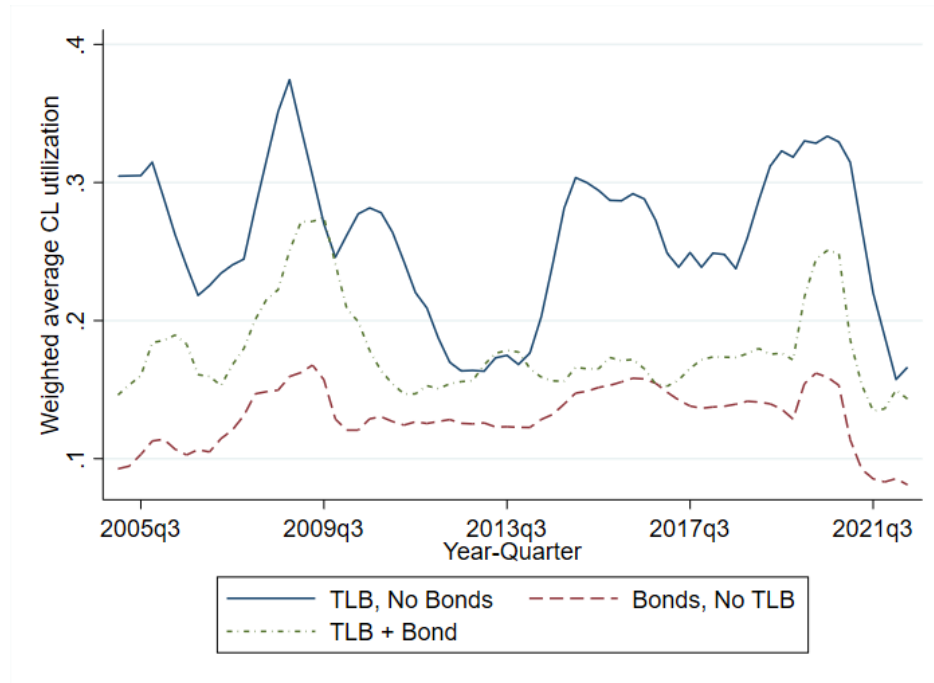


Table 1: Summary Statistics

This table presents the summary statistics for borrowers with syndicated loans that can be matched to Compustat financial information between 2000-2024. The panel is at the borrower-year-quarter level. We present results for all borrowers and separately for bank and nonbank borrowers. A borrower is classified as a nonbank borrower if it has any nonbank term loans (Term Loans B-K) outstanding in the given quarter. A borrower with only bank loans (Term Loan A or credit line) is classified as a bank borrower. *Nonbank Dependence* is the volume of nonbank term loans (TLB) outstanding as a share of total term loans outstanding to the borrower. *Assets* are the average firm asset size from Compustat. *Total Liabilities/Assets* is total firm liabilities to assets. *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. *Share unrated firms* is the share of all firms without ratings in CapitalIQ. *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. *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 drawdown 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.

	All		Bank		Nonbank		Diff.
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Diff.
Nonbank Dependence	0.17	0.34	0.00	0.00	0.76	0.27	-0.76***
Assets (\$ bil.)	12.14	74.35	11.87	60.64	13.08	109.36	-1.20**
Total Liabilities/Assets	0.63	0.28	0.59	0.26	0.75	0.31	-0.16***
Debt/Assets	0.33	0.24	0.30	0.22	0.46	0.27	-0.17***
Cash/Assets	0.10	0.13	0.10	0.13	0.08	0.10	0.02***
Share unrated firms	0.55	0.50	0.60	0.49	0.41	0.49	0.19***
Credit Line >0	0.94	0.23	0.95	0.21	0.91	0.29	0.05***
Credit Line/Total Loans	0.73	0.34	0.84	0.28	0.37	0.27	0.48***
Credit Line/(Credit Line + Cash)	0.68	0.31	0.68	0.31	0.67	0.32	0.01***
Drawn Spread - CL (bps)	180.55	105.65	163.17	98.88	240.99	106.17	-77.81***
Undrawn Spread - CL (bps)	30.22	19.91	26.76	18.67	42.00	19.47	-15.24***
Drawn credit line (<i>mil.</i>)	107.30	254.06	106.75	246.48	109.06	277.25	-2.31
Credit line commitment (<i>mil.</i>)	714.41	1,196.16	755.94	1,231.70	574.24	1,055.50	181.70***
Credit line utilization	0.22	0.28	0.22	0.28	0.19	0.27	0.03***
Observations	228140		176172		51968		

Table 2: 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 2000Q1-2024Q4. *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. In Panel A, we measure credit line volume at issuance. Columns 1 and 2 measure credit line as a share of total loans to the borrower. Columns 3 and 4 measure credit lines as a share of total liquidity (measured by cash plus credit lines). Columns 5 reports results for the log of credit line volume at issuance; Columns 6 reports credit line volume scaled by firm asset size at issuance, Column 7 reports credit line volume scaled by firm sales at issuance. In Panel B, we measure loan spreads in basis points. Columns 1 to 5 present results for credit lines while Columns 6 and 7 present results for bank and nonbank term loans respectively. Controls for firm size, debt-to-asset ratio, loan maturity, deal purpose, whether the credit line is secured are included in Panel A and B. In Panels C and D we relate the covenants attached to credit-line deals to borrower nonbank dependence. Panel C reports 0/1 indicators for whether a deal contains each covenant type: *ICR*, an interest-coverage covenant (a floor on EBITDA-to-interest expense); *Capex*, a limit on capital expenditures; *Cash Sweep*, a requirement that cash proceeds from certain activities (e.g., asset sales) be used to repay debt; *Dividend Restriction*, any material restriction on dividends; *Performance Based Covenant*, any profitability-based covenant (debt-service, fixed-charge, or interest coverage, or senior- or total-debt-to-EBITDA); and *Capital Ratio Based Covenant*, any capital-ratio covenant (leverage, debt-to-tangible-net-worth, or senior-debt leverage). Panel D focuses on the most common financial-ratio covenants, reporting both their presence and, conditional on presence, how tightly they are set. Columns 1–3 indicate the presence of a debt-to-EBITDA, or leverage, covenant (*D/EBITDA*), an interest-coverage covenant (*ICR*), and a fixed-charge-coverage covenant (*FCC*; EBITDA over fixed charges such as interest, scheduled principal, and leases). Columns 4–6 report the contractual threshold on each, conditional on its presence – maximum permitted leverage (*Max D/EBITDA*), minimum interest coverage (*Min ICR*), and minimum fixed-charge coverage (*Min FCC*). Columns 7–8 measure the tightness of the capital-expenditure limit scaled by assets (*Capex/Assets*) and the fraction of cash flow that must be swept to repay debt (*CF Sweep %*). We include loan size, all-in-drawn and all-in-undrawn spreads, loan maturity, and firm asset size as controls in Panel C and D. Panels C and D end in 2022Q4 since they are sourced from the legacy DealScan files. We include borrower, borrower rating $\times$ year-quarter fixed effects, two-digit SIC code $\times$ year-quarter fixed effects 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 Volume

	CL/Total Loans		CL/(CL+Cash)		Log(CL)	CL/Assets	CL/Sales
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Nonbank Dependence	-0.231*** (0.012)	-0.164*** (0.015)	-0.047*** (0.010)	-0.033*** (0.010)	-0.221*** (0.041)	-0.027*** (0.005)	-0.047*** (0.017)
Rating x Year-Quarter FE	N	Y	N	Y	Y	Y	Y
Borrower FE	N	Y	N	Y	Y	Y	Y
Industry x Year-Quarter FE	N	Y	N	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y	Y
Unconditional mean	0.74	0.73	0.64	0.64	5.43	0.16	0.29
Obs.	30,058	27,296	30,038	27,277	27,297	27,297	20,757
R ²	0.098	0.502	0.150	0.757	0.780	0.737	0.783

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	40.378*** (4.005)	5.331*** (1.124)	-0.725 (1.007)	-0.841 (0.934)	5.758 (3.658)	90.714*** (17.364)	-56.440** (25.505)
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	179.40	28.40	69.36	16.98	105.48	246.72	329.47
Obs.	25,003	19,694	11,068	16,782	7,087	5,494	2,995
R^2	0.757	0.723	0.903	0.606	0.827	0.870	0.845

Panel C - Covenants on CL Deals

	(1)	(2)	(3)	(4)	(5)	(6)
	ICR	Capex	Cash Sweep	Dividend Restriction	Performance Based Covenant	Capital Ratio Based Covenant
Nonbank Dependence	-0.011 (0.018)	-0.015 (0.015)	0.077*** (0.014)	-0.093*** (0.022)	-0.069*** (0.021)	-0.024** (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
Controls	Y	Y	Y	Y	Y	Y
Unconditional mean	0.16	0.11	0.09	0.38	0.31	0.09
Obs.	14,925	14,925	14,925	14,925	14,925	14,925
R^2	0.524	0.676	0.628	0.655	0.580	0.543

Panel D - Covenant Tightness

	Covenant Presence (0/1)			Financial Cov Threshold			General Cov Tightness	
	(1) D/EBITDA Cov	(2) ICR Cov	(3) FCC Cov	(4) Max D/EBITDA	(5) Min ICR	(6) Min FCC	(7) Capex/ Assets	(8) CF Sweep (%)
Nonbank Dependence	-0.044** (0.020)	-0.010 (0.018)	-0.035** (0.015)	0.195 (0.128)	-0.086 (0.099)	0.214* (0.117)	0.005 (0.010)	12.249* (7.323)
Rating x Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y
Borrower FE	Y	Y	Y	Y	Y	Y	Y	Y
Industry x Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Unconditional mean	0.22	0.16	0.12	3.83	2.77	1.51	0.06	41.44
Obs.	14,980	14,980	14,980	1,664	1,023	433	461	222
R^2	0.585	0.525	0.619	0.938	0.966	0.942	0.978	0.930

Table 3: Robustness Tests

This table presents robustness tests on how credit line access varies with nonbank dependence of the borrower. In Panel A, data is at the bank-borrower-year-quarter level and the sample period is 2000Q1-2024Q4. *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. Columns 1 -3 measure credit lines as a share of total loans at issuance, and Columns 4-6 measure all-in-drawn-spread of credit lines. In Column 1 and 4, we look at the impact of bank-borrower relationships. *Bank-Borrower Relationship* measures the share of bank term loans (TLA) to a borrower over the last three years from the bank and is included in all columns. Column 2 (5) and 3(6) add varying levels of fixed effects for robustness. Panels B and C present borrower-level robustness for credit-line volume (*CL/Total Loans* at issuance in Panel B, *log(CL)* at issuance in Panel C) and drawn spreads (*AISD*, Panel D). In all three panels, Column 1 adds the firm's market beta (estimated from a regression of firm stock returns on the S&P500) as a control, Column 2 adds the firm's short-term debt share, and Column 3 adds the number of covenants; Column 4 restricts to "switcher" firms observed on both sides of the nonbank-dependence margin, Column 5 to firms with positive EBITDA, and Column 6 to rated firms. Controls for firm size, debt-to-asset ratio, bank-borrower relationship strength, loan maturity, collateral, 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 - Bank-Borrower Level Robustness

	CL/Total Loans at Issuance			All-in Drawn Spread		
	(1)	(2)	(3)	(4)	(5)	(6)
Nonbank Dependence	-0.145*** (0.009)	-0.144*** (0.009)	-0.117*** (0.008)	29.070*** (3.222)	28.983*** (3.186)	24.851*** (3.250)
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
Bank x Year-Quarter FE	N	Y	Y	N	Y	Y
Bank x Borrower FE	N	N	Y	N	N	Y
Obs.	129,668	129,586	114,997	124,137	124,049	109,503
R^2	0.785	0.792	0.834	0.847	0.852	0.883

Robustness Tests - continued

Panel B - Borrower Level Robustness - Volume - CL/Total Loans

	(1) + Beta	(2) + ST Debt	(3) + Cov Count	(4) Switchers	(5) EBITDA>0	(6) Rated only
Nonbank Dependence	-0.210*** (0.013)	-0.165*** (0.016)	-0.167*** (0.015)	-0.168*** (0.017)	-0.165*** (0.015)	-0.128*** (0.021)
Rating x Year-Quarter FE	Y	Y	Y	Y	Y	Y
Borrower FE	N	Y	Y	Y	Y	Y
Industry x Year-Quarter FE	Y	Y	Y	Y	Y	Y
Sample	Beta sample	Full	Full	Switchers	EBITDA>0	Rated only
Unconditional mean	0.73	0.73	0.74	0.65	0.73	0.72
Obs.	23,006	23,875	27,294	9,423	24,776	12,891
R ²	0.237	0.513	0.502	0.628	0.569	0.626

Panel C - Borrower Level Robustness - Volume - Log(CL)

	(1) + Beta	(2) + ST Debt	(3) + Cov Count	(4) Switchers	(5) EBITDA>0	(6) Rated only
Nonbank Dependence	-0.269*** (0.038)	-0.230*** (0.044)	-0.218*** (0.041)	-0.262*** (0.051)	-0.218*** (0.043)	-0.247*** (0.060)
Rating x Year-Quarter FE	Y	Y	Y	Y	Y	Y
Borrower FE	N	Y	Y	Y	Y	Y
Industry x Year-Quarter FE	Y	Y	Y	Y	Y	Y
Sample	Beta sample	Full	Full	Switchers	EBITDA>0	Rated only
Unconditional mean	5.32	5.46	5.43	5.31	5.52	5.98
Obs.	23,006	23,876	27,295	9,423	24,777	12,891
R ²	0.676	0.783	0.782	0.758	0.769	0.732

Panel D - Borrower Level Robustness - Spreads

	(1) + Beta	(2) + ST Debt	(3) + Cov Count	(4) Switchers	(5) EBITDA>0	(6) Rated only
Nonbank Dependence	51.459*** (3.588)	43.070*** (4.227)	39.189*** (3.973)	44.003*** (5.351)	33.052*** (4.006)	31.812*** (5.169)
Rating x Year-Quarter FE	Y	Y	Y	Y	Y	Y
Borrower FE	N	Y	Y	Y	Y	Y
Industry x Year-Quarter FE	Y	Y	Y	Y	Y	Y
Sample	Beta sample	Full	Full	Switchers	EBITDA>0	Rated only
Unconditional mean	188.21	179.72	179.28	212.77	172.39	170.73
Obs.	21,091	21,722	24,916	8,603	22,636	11,657
R ²	0.561	0.776	0.767	0.753	0.771	0.821

Table 4: Bank Balance Sheet Constraints and Nonbank Dependence

This table tests whether bank balance sheet constraints amplify the effect of nonbank dependence on credit line access. Data is at the bank $\times$ borrower $\times$ quarter level from 2000-2024. *Nonbank Dependence* is interacted with time-varying, standardized bank balance sheet measures. In Column 1 and 2, we measure log of credit line outstanding in a given quarter from a bank to a borrower and Columns 3 and 4 measure the weighted average spread on credit lines outstanding to a borrower from a bank in a given quarter. In Column 1 and 3, we use the bank's Tier 1 capital ratio from BHC Call Reports. In Column 2 and 4, we use the bank's liquidity ratio (liquid assets / total assets). All specifications include borrower, bank, rating $\times$ year-quarter, and industry $\times$ year-quarter fixed effects. Controls for firm size, debt-to-asset ratio, strength of bank-borrower relationship based on share of loans to the borrower from the bank in the prior 3 years, remaining maturity, and whether the credit line is secured are included. 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 Outstanding)		Spread (bps)	
	(1) Tier 1	(2) Liquidity	(3) Tier 1	(4) Liquidity
Nonbank Dependence	-0.075*** (0.024)	-0.082*** (0.024)	29.868*** (2.636)	31.068*** (2.593)
Tier 1 Capital (std)	-0.033*** (0.005)		-1.590*** (0.366)	
NB Dep $\times$ Tier 1	0.037*** (0.012)		-3.545*** (1.339)	
Liquidity Ratio (std)		-0.036*** (0.006)		-0.046 (0.466)
NB Dep $\times$ Liquidity		0.048*** (0.011)		0.282 (1.046)
Rating $\times$ YQ FE	Y	Y	Y	Y
Borrower FE	Y	Y	Y	Y
Ind $\times$ YQ FE	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y
Obs.	1,126,150	1,188,520	1,088,483	1,148,213
R^2	0.598	0.593	0.677	0.680

Table 5: 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). In Panel A, we present results separately for borrowers with low and high exposure to the oil-gas shock based on CLO holdings where 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* and borrowers with TLB outstanding as of 2014Q1 but none maturing during the oil price shock are classified as *Active TLB*. 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. *Share unrated firms* is the share of all firms without ratings in CapitalIQ. *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. Spread on Outstanding TLB* is the average all-in-drawn-spread on nonbank loans outstanding to the borrower in bps. Borrowers in oil-and-gas (SIC =13) sector are dropped.

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	0.78	0.93	0.29	0.80	0.89	0.25	-0.02
Assets (\$ bil.)	19.19	2.86	124.29	19.97	2.41	145.55	-0.78
Total Debt/Assets	0.36	0.37	0.25	0.49	0.45	0.29	-0.12***
Cash/Assets	0.11	0.07	0.13	0.07	0.05	0.08	0.04**
Share unrated firms	0.54	1.00	0.50	0.51	1.00	0.50	0.03
Log(CL Outstanding)	5.26	5.30	1.61	5.48	5.52	1.45	-0.22*
Avg. Drawn Spread on Outstanding CL (bps)	335.92	318.75	142.96	342.15	327.85	132.74	-6.23
Log(TLB Outstanding)	5.98	5.97	1.45	6.69	6.57	1.11	-0.70***
Avg. Spread on Outstanding TLB (bps)	416.07	400.00	134.36	406.00	382.38	122.19	10.07
Observations	395			478			873

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	0.03	0.02	0.01	0.00	0.02	0.01***
Nonbank Dependence	0.79	0.92	0.28	0.81	0.88	0.23	-0.02
Assets (\$ bil.)	21.56	2.23	155.94	14.54	3.29	62.87	7.02
Total Debt/Assets	0.43	0.42	0.27	0.45	0.42	0.28	-0.02
Cash/Assets	0.09	0.05	0.11	0.09	0.05	0.11	0.00
Share unrated firms	0.52	1.00	0.50	0.53	1.00	0.50	-0.01
Log(CL Outstanding)	5.28	5.30	1.47	5.67	5.82	1.61	-0.39**
Avg. Drawn Spread on Outstanding CL (bps)	341.40	325.00	137.08	334.69	321.11	137.23	6.71
Log(TLB Outstanding)	6.27	6.23	1.23	6.62	6.68	1.48	-0.35***
Avg. Spread on Outstanding TLB (bps)	420.01	400.00	129.34	387.64	374.77	120.91	32.37***
Observations	620			253			873

Table 6: 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 term loans and credit lines for each borrower i in quarter t between 2012Q1-2017Q4. 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. TLB (TLA/CL) Vol. is the log of volume of TLB (TLA/CL) issued in the quarter. CL Out. is the total volume of credit line outstanding in the quarter. Loan spreads are weighted average spreads on outstanding loans in the quarter. 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 2014Q2-2015Q4. The omitted group in the regression is 2014Q1 (the quarter before the oil price shock). Panel B splits the full sample by rollover risk. In Columns (1) (3) (5) (6) and (7), we focus on the volume of loans extended, with Column (7) reporting the outstanding stock of credit lines (CL Out) rather than new originations. In Columns (2) (4) and (8), we look at the weighted average spreads on all outstanding loans of a given type. Panel C decomposes each borrower's outstanding credit-line stock by the origination cohort of the underlying tranche (pre-shock, originated on or before 2014Q1, vs. post-shock), estimated separately for Active and Maturing TLB borrowers: Column 1 reports the intensive margin on pre-shock CLs (log balance conditional on positive), Column 2 $\ln(1 + \text{CL})$ for the post-shock cohort, and Column 3 the extensive margin on post-shock CLs (an indicator for any post-shock-originated balance). Borrowers in oil-and-gas sector (SIC=13) are dropped. We include borrower fixed effects, rating fixed effects, and year quarter fixed effects. 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 - Full Sample

	TLB Vol.	Spread TLB	TLA Vol.	Spread TLA	Term Loans Vol.	CL Vol.	CL Out	Spread CL
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Oil shock exposure x Post x Mat TLB	-0.137*** (0.047)	11.222** (5.244)	-0.088** (0.035)	17.738** (8.546)	-0.194*** (0.052)	-0.120*** (0.043)	-0.171*** (0.056)	10.169* (5.210)
Borrower 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.	8,878	7,547	8,878	4,195	8,878	8,878	7,909	7,572
R ²	0.140	0.868	0.111	0.898	0.128	0.084	0.875	0.795

Panel B - Full Sample - split by rollover risk

	(1) TLB Vol.	(2) Spr TLB	(3) TLA Vol.	(4) Spr TLA	(5) Term Vol.	(6) CL Vol.	(7) CL Out	(8) Spr CL
<i>Maturing TLB only:</i>								
Oil Exp $\times$ Post	-0.228*** (0.041)	8.773* (4.698)	-0.089*** (0.033)	16.793** (7.034)	-0.264*** (0.047)	-0.158*** (0.038)	-0.104** (0.050)	11.698** (4.714)
<i>Active TLB only:</i>								
Oil Exp $\times$ Post	-0.095*** (0.024)	-1.284 (2.432)	-0.001 (0.016)	1.304 (4.173)	-0.077*** (0.026)	-0.045** (0.022)	0.060*** (0.023)	0.864 (1.907)
Obs. (Mat / Act)	2,379 / 6,499	2,009 / 5,538	2,379 / 6,499	1,206 / 2,989	2,379 / 6,499	2,379 / 6,499	2,170 / 5,739	2,113 / 5,459

Panel C - Margin of Adjustment

	(1) Log(CL pre) >0	(2) Log(1+CL post)	(3) 1{CL post > 0}
<i>Panel A: Active TLB</i>			
Oil-Gas Exposure $\times$ Post	0.013 (0.024)	0.233*** (0.076)	0.038*** (0.013)
Obs.	5,447	6,499	6,499
R^2	0.897	0.624	0.639
<i>Panel B: Mat TLB</i>			
Oil-Gas Exposure $\times$ Post	-0.101* (0.060)	0.089 (0.142)	0.012 (0.022)
Obs.	2,171	2,379	2,379
R^2	0.885	0.595	0.597

Table 7: Oil Price Shock - CLO Constraint Mechanism

This table identifies the CLO constraint as the mechanism through which the oil shock transmits to credit lines. Panel A is a CLO-level cross-section: for each CLO we regress the change in a coverage-test cushion (the test result divided by its required threshold) between 2014Q1 and 2015Q4 on the CLO's pre-shock (2014Q1) oil-gas portfolio share. The columns report the senior overcollateralization (OC), junior OC, and interest-coverage tests. All are minimum-coverage tests, so a decline in the cushion (a negative coefficient) reflects deterioration toward the covenant threshold; standard errors are robust. Panel B examines secondary-market loan transactions over 2013–2015 and is restricted to non-oil-and-gas loans. The regressor is a loan's *Oil-Gas Exposure* (the position-weighted average oil-gas portfolio share of the CLOs that hold it) interacted with *Post* (2014m6 onward). The outcomes are the value-weighted average secondary sale price (per \$100 of par) and net transaction volume (buys minus sells, in \$ millions, so negative values denote net selling). The columns alternate firm and loan fixed effects; all include month-year fixed effects, and standard errors are clustered by loan. Panel C reports, for the junior-OC and interest-coverage tests, the median pre-shock cushion slack (distance to trigger), the cushion compression implied by applying the Panel A slope to the median 3% O&G share, that compression as a share of slack, and a regression of the post-shock distance-to-trigger on CLO O&G exposure. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - CLO Coverage-Test Deterioration

	(1)	(2)	(3)
	Δ Senior OC	Δ Junior OC	Δ Interest Cov.
CLO Oil-Gas Exposure	-2.389 (1.449)	-0.716** (0.330)	-9.374*** (2.762)
Obs.	176	157	106
R^2	0.014	0.008	0.096

Panel B - Covenant-Driven Fire Sales

	Sale Price (per 100)		Net Volume (M)	
	(1)	(2)	(3)	(4)
	Firm FE	Loan FE	Firm FE	Loan FE
Loan O&G Exposure $\times$ Post	-0.527*** (0.180)	-0.443** (0.195)	-2.525*** (0.394)	-2.391*** (0.406)
Observations	34179	34078	34250	34150
Loan FE		Y		Y
Firm FE	Y		Y	
Month FE	Y	Y	Y	Y
R^2	0.533	0.590	0.059	0.090

Panel C - Distance to Covenant Trigger and Cushion Slack

	Median pre-shock slack (to trigger)	Cushion compression at 3% O&G	% of slack consumed	Post-shock distance to trigger on O&G
Junior OC	0.053	-0.021	40%	-0.31*** (-2.76)
Interest coverage	0.318	-0.281	88%	0.10 (0.06)

Table 8: Borrower Credit Access - Oil Price Shock - Robustness

This table presents three robustness tests for borrower credit access. The sample include firms with TLBs as of 2014Q1 excluding firms in the oil-gas sector. Sample period is 2012Q1-2017Q4. TLB (CL) Vol. is the log of volume of TLB (CL) issued in the quarter. TLB (CL) Out. is the total volume of TLB (CL) outstanding in the quarter. Loan spreads are weighted average spreads on outstanding loans in the quarter. Panel A splits the sample based on whether a bank is LISCC or not. LISCC banks are the 8 institutions under the Fed's Large Institution Supervision Coordinating Committee (BoA, BNYM, Citi, Goldman, JPM, Morgan Stanley, State Street, Wells Fargo). We collapse the bank $\times$ borrower $\times$ quarter panel to borrower $\times$ LISCC $\times$ quarter — summing facility/allocation amounts and allocation-weighting spreads across LISCC and non-LISCC banks separately — and estimate the triple DiD on each subsample. In Panel B, we further restrict the sample to non-LISCC banks and borrowers with Debt/ EBITDA < 6 as of 2014Q1. Panel C controls for two confounding bank-side channels: the direct bank credit-supply channel, captured by *Bank O&G Exp.* $\times$ *Post* (each borrower's 2014Q1-lending-weighted average of its lending banks' outstanding portfolio share to oil & gas borrowers, standardized and interacted with *Post*); and mechanical bank-stock-return comovement with confounding factors, captured by bank-beta $\times$ factor-return controls for XLE, XOP, KBE, WTI, and Δ TNX. This panel is restricted to the sample of public banks. Panel D splits maturing TLB borrowers by their recent (pre-shock) TLB market access, based on whether they originated any other TLB in the 2-years prior to the oil shock. Panel E progressively adds borrower-level controls for macro sensitivity to the triple-DID: pre-shock market beta estimated from monthly CRSP returns (June 2011 – May 2014) and foreign income to assets (pretax foreign income scaled by total assets, Compustat fiscal 2013), each standardized and interacted with *Post*. Standard errors clustered at the borrower level. Significance levels: *($p < 0.10$), **($p < 0.05$), ***($p < 0.01$).

Panel A - LISCC vs. non-LISCC banks

	LISCC Banks				Non-LISCC Banks			
	(1) TLB Vol	(2) Spread TLB	(3) CL Out	(4) CL Sprd	(5) TLB Vol	(6) Spread TLB	(7) CL Out	(8) CL Sprd
Oil x Post x Mat TLB	-0.098** (0.046)	10.649* (5.556)	-0.108* (0.062)	10.955** (5.475)	-0.106** (0.049)	11.649** (5.455)	-0.214*** (0.061)	10.523* (5.424)
Borrower 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.	8,532	7,319	7,259	7,375	8,852	7,525	7,811	7,552
R^2	0.142	0.866	0.841	0.782	0.138	0.868	0.875	0.793

Panel B - Non-LISCC banks, low-leverage borrowers

	(1) TLB Vol.	(2) Spread TLB	(3) TLA Vol.	(4) Spread TLA	(5) Term Loans Vol.	(6) CL Vol.	(7) CL Out	(8) Spread CL
	(0.061)	(8.279)	(0.054)	(15.816)	(0.069)	(0.071)	(0.121)	(8.611)
Oil x Post x Mat TLB	-0.059 (0.061)	9.707 (8.279)	-0.082 (0.054)	-0.246 (15.816)	-0.134* (0.069)	-0.094 (0.071)	-0.340*** (0.121)	13.553 (8.611)
Borrower 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.	4,312	3,543	4,312	2,222	4,312	4,312	3,817	3,673
R^2	0.123	0.872	0.119	0.903	0.117	0.087	0.855	0.818

Borrower Credit Access - Oil Price Shock - Robustness contd.

Panel C - Bank oil exposure and bank-beta confounder controls

	Baseline				Bank O&G Exposure + Bank β Controls			
	(1) TLB Vol.	(2) Spread TLB	(3) CL Vol.	(4) Spread CL	(5) TLB Vol.	(6) Spread TLB	(7) CL Vol.	(8) Spread CL
Oil $\times$ Post $\times$ Mat TLB	-0.107*** (0.036)	8.656** (4.031)	-0.095*** (0.033)	7.507* (4.111)	-0.104*** (0.036)	8.716** (4.021)	-0.095*** (0.033)	7.724* (4.101)
Bank O&G Exp. (std) $\times$ Post					-0.149*** (0.055)	-6.016 (5.462)	-0.012 (0.046)	-13.255** (5.246)
Borrower FE	Y	Y	Y	Y	Y	Y	Y	Y
Rating FE	Y	Y	Y	Y	Y	Y	Y	Y
Yr-Qtr FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank $\beta \times$ Factor					Y	Y	Y	Y
Obs.	9,468	8,149	9,468	7,967	9,468	8,149	9,468	7,967
R-squared	0.144	0.864	0.090	0.791	0.145	0.864	0.090	0.792

Panel D - Recent market access

	(1) TLB Vol.	(2) Spread TLB Out.	(3) CL Vol.	(4) Spread CL Out.
Oil $\times$ Post $\times$ Mat (recent TLB)	-0.074 (0.061)	15.501** (7.602)	-0.143** (0.062)	9.489 (8.154)
Oil $\times$ Post $\times$ Mat (no recent TLB)	-0.053 (0.076)	5.170 (6.892)	-0.062 (0.063)	13.893* (8.420)
Difference (access—no access)	-0.021	10.331	-0.081	-4.404
p-value (access=no access)	0.821	0.285	0.330	0.699
Borrower FE	Y	Y	Y	Y
Rating FE	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y
Obs.	9,636	7,637	9,636	8,158
R-squared	0.145	0.870	0.083	0.808

Panel E - Borrower Cyclicalities

	TLB Vol.			CL Out.			CL Spread		
	(1) + Ind x YQ	(2) + Beta	(3) + Fgn/Assets	(4) + Ind x YQ	(5) + Beta	(6) + Fgn/Assets	(7) + Ind x YQ	(8) + Beta	(9) + Fgn/Assets
Oil Exp $\times$ Post $\times$ Mat TLB	-0.165*** (0.054)	-0.177*** (0.053)	-0.181*** (0.052)	-0.170*** (0.066)	-0.173** (0.074)	-0.167** (0.071)	4.181 (5.513)	4.891 (6.064)	5.011 (6.045)
Pre-shock Beta $\times$ Post		-0.040 (0.054)	-0.034 (0.053)		-0.055 (0.055)	-0.054 (0.053)		-9.898* (5.759)	-9.492* (5.691)
Foreign/Assets $\times$ Post			0.077 (0.120)			-0.087 (0.113)			2.715 (7.018)
Borrower FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Rating FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry $\times$ Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Obs.	8,708	6,576	6,404	7,720	5,799	5,674	7,374	5,553	5,434
R ²	0.245	0.258	0.258	0.892	0.897	0.895	0.825	0.821	0.819

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 between 2012Q1 and 2017Q4. 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 2014Q2-2015Q4. The omitted group in the regression is 2014Q1 (the quarter before the oil price shock) excluding firms in the oil-gas sector. *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 year quarter fixed effects, and firm size controls. 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* (0.095)	-0.029 (0.023)	-0.024** (0.011)	-0.025** (0.011)
Borrower 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

Table 10: Nonbank Dependence Heterogeneity

This table looks at availability of bank liquidity based on different measures of nonbank dependence of a borrower in the bond market and the syndicated loan market. Data is at the borrower-year-quarter level and the sample period is 2000Q1-2022Q4. We measure *Bond Dependence* as total bonds outstanding as a share of total syndicated term loans and bonds outstanding. *TLB Share* measures the nonbank dependence in the syndicated loan market and is based on the volume of nonbank term loans (Term Loan B-K) outstanding as a share of total term and bonds loans outstanding for a borrower. Column 1 measures credit line as a share of total liquidity (measured by cash plus credit lines). Column 2 measures credit lines as a share of total assets. Column 3 presents results for all-in-drawn-spread while Column 4 presents results for the all-in-undrawn-spread. Our sample comprises public borrowers with either a nonbank syndicated loan or bond outstanding. All variables are standardized to have a mean of zero and standard deviation of one. We include borrower, two-digit SIC code $\times$ year-quarter fixed effects, and rating $\times$ year-quarter fixed effects. Controls include firm size and leverage. Standard errors are clustered at the borrower level and reported in parentheses below the coefficients. Significance levels: *($p < 0.10$), **($p < 0.05$), ***($p < 0.01$).

	CL/(CL+Cash)	CL/Assets	AISD	AISU
	(1)	(2)	(3)	(4)
Bond Dependence	-0.043*** (0.005)	-0.059*** (0.007)	-10.103*** (2.101)	-1.457*** (0.427)
TLB Share	-0.035*** (0.005)	-0.046*** (0.008)	7.378*** (2.100)	1.650*** (0.437)
Rating x Year-Quarter FE	Y	Y	Y	Y
Borrower FE	Y	Y	Y	Y
Industry x Year-Quarter FE	Y	Y	Y	Y
Controls	Y	Y	Y	Y
Unconditional mean	0.69	0.29	195.64	33.34
Obs.	94,036	94,053	86,895	77,771
R^2	0.726	0.682	0.774	0.776

Online Appendix

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

This version: June 24, 2026

Table OA1: Variable Definitions

Name	Definition	Source
Panel A: Loan Classification and Nonbank Dependence		
Bank Term Loan	Facility type — “Term Loan A” and “Term Loan”.	DealScan
Nonbank Term Loan	Facility type — “Term Loan B–K”.	DealScan
Term Loan Volume	Sum of all term loans issued (outstanding) in a given quarter.	DealScan
Total Loan Volume	Sum of all loans — term loans plus credit lines — issued (outstanding) in a given quarter.	DealScan
Loan Size (mil.)	Size of a loan facility in millions of dollars.	DealScan
Maturity (months)	Maturity of the loan at origination in months.	DealScan
Bank borrower	Borrowers that have only bank term loans.	DealScan
Nonbank borrower	Borrowers that have at least one nonbank term loan.	DealScan
Nonbank Dependence	Amount of nonbank loans (TLB) outstanding as a share of total term loans outstanding for a borrower in a given quarter. We construct three variants that differ in how unclassified “Term Loan” tranches are treated: as bank loans (TLA) in our preferred specification; as nonbank loans (TLB); or split by DealScan’s “Market Segment” field (institutional vs. pro rata).	DealScan
Nonbank Share	Amount of nonbank loans <i>issued</i> as a share of total term loans issued in a given quarter.	DealScan
TLB Share	Volume of nonbank term loans (TLB) outstanding as a share of total term loans (TLA plus TLB) and bonds outstanding for the borrower. Used in the bond–loan horse race; standardized in the regressions.	DealScan, Capital IQ

continued on next page

Table OA1 – continued

Name	Definition	Source
Bond Dependence	Senior and subordinated bonds outstanding as a share of total bonds and term loans (TLA plus TLB) outstanding for the borrower in a given quarter. Same denominator as TLB Share; standardized in the regressions.	Compustat, Capital IQ, DealScan
Panel B: Credit-Line Measures		
Credit Line/Total Loans	Credit lines as a share of total loan volume (sum of term loans and credit lines).	DealScan
Credit Line/(Credit Line+Cash)	Credit line outstanding as a share of total liquidity (cash plus credit lines outstanding) for the borrower.	DealScan, Compustat
Log(CL)	Natural log of credit-line volume at issuance.	DealScan
CL/Assets	Volume of credit lines at issuance scaled by firm assets.	DealScan, Compustat
CL/Sales	Volume of credit lines at issuance scaled by firm sales.	DealScan, Compustat
Cash/(Cash+CL)	Cash and cash equivalents as a share of total liquidity (cash plus credit lines outstanding); the complement of Credit Line/(Credit Line+Cash).	DealScan, Compustat
Credit Line Utilization	One minus the undrawn credit-line balance divided by the total credit-line balance. Missing within-year quarters are filled with the nearest available value (Q4, else Q2).	Capital IQ
Credit Line Drawdown	Drawn (outstanding) balance on the borrower's revolving credit lines in dollars; entered in logs in the regressions.	Capital IQ
Panel C: Credit-Line Pricing and Covenants		
Drawn spread / AISD	Spread on term loans or the drawn portion of credit lines — the all-in spread drawn, i.e. the coupon spread plus facility fee.	DealScan
Undrawn spread / AISU	Spread on the undrawn portion of credit lines.	DealScan

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Table OA1 – continued

Name	Definition	Source
Upfront fee	Fee paid by the borrower to lenders upon closing of a loan.	DealScan
Commitment Fee	Fee paid by the borrower on unused loan commitments.	DealScan
TCB	Total cost of borrowing, accounting for spreads and fees, following Berg et al. (2016) .	DealScan + author calc.
ICR covenant	Equals one if the contract has an interest-coverage covenant (minimum EBITDA to interest expense the firm must maintain).	DealScan
Capex covenant	Equals one if a restriction on capital expenditures exists.	DealScan
Cash Sweep covenant	Equals one when a cash sweep is part of the credit agreement. Cash sweeps require that cash proceeds from certain activities (e.g. asset sales) be used to repay debt.	DealScan
Dividend Restriction covenant	Equals one if the contract restricts dividends or other restricted payments.	DealScan
Performance-Based Covenant	Equals one if any profitability-related covenant is present (debt-service, fixed-charge, or interest coverage; or senior- or total-debt-to-EBITDA).	DealScan
Capital-Ratio-Based Covenant	Equals one if any capital-ratio covenant is present (leverage, debt-to-tangible-net-worth, or senior-debt leverage).	DealScan
Covenant presence: D/EBITDA, ICR, FCC	Indicators equal to one if the credit agreement contains a debt-to-EBITDA (leverage), interest-coverage, or fixed-charge-coverage covenant, respectively. FCC is EBITDA over fixed charges such as interest, scheduled principal, and leases.	DealScan

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Table OA1 – continued

Name	Definition	Source
Covenant thresholds	Conditional on a covenant's presence, the contractual threshold it sets: maximum permitted leverage (Max D/EBITDA), minimum interest coverage (Min ICR), minimum fixed-charge coverage (Min FCC), the capital-expenditure limit scaled by assets (Capex/Assets), and the share of cash flow that must be swept to repay debt (CF Sweep %).	DealScan
Panel D: Borrower Characteristics and Real Outcomes		
Assets	Firm asset size.	Compustat
Cash/Assets	Cash and cash equivalents scaled by firm assets.	Compustat
Total Leverage/Assets	Total firm liabilities plus preferred stock, minus deferred taxes and convertible debt, scaled by total assets.	Compustat
Debt/Assets	Total firm short-term and long-term debt scaled by assets.	Compustat
Debt/EBITDA	Total debt to EBITDA (a leverage ratio); used to identify low-leverage borrowers ($\text{Debt/EBITDA} < 6$) in the leveraged-lending robustness tests.	Compustat
Rating and Share Unrated	Group classification based on long-term issuer rating, with separate groups from AAA to C and an unrated group. Share Unrated is the share of borrowers without a risk rating.	Compustat
Market beta	Firm's market beta, estimated from a regression of the firm's monthly stock returns on S&P 500 returns.	CRSP
Short-term debt share	Debt in current liabilities as a share of total debt.	Compustat
Foreign income/Assets	Pretax foreign income scaled by total assets, fiscal year 2013.	Compustat

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Table OA1 – continued

Name	Definition	Source
LT Inv/Assets	Total long-term investments scaled by firm assets as of 2014Q2 (a fixed pre-shock base, so changes reflect the numerator).	Compustat
Capital/Assets	Total invested capital scaled by firm assets as of 2014Q2 (a fixed pre-shock base).	Compustat
Debt and equity issuance	A set of eight financing outcomes used in the substitution test: net long-term debt issuance/assets, change in long-term debt/assets, change in current debt/assets, log long-term debt, change in book equity/assets, net equity issuance/assets, change in shares outstanding, and log book equity. Flow variables are quarterized from Compustat year-to-date items.	Compustat
Panel E: Bank Characteristics		
Tier 1 capital ratio	Bank holding company's Tier 1 risk-based capital ratio.	FR Y-9C
Liquidity ratio	Bank holding company's liquid assets, net of MBS/ABS, scaled by total assets.	FR Y-9C
Bank-borrower relationship	Share of a borrower's total loans over the prior three years that come from a given bank.	DealScan
Bank O&G Exposure	A lending bank's outstanding portfolio share to oil-and-gas borrowers (SIC 13).	DealScan
Bank β	Bank's pre-shock (June 2011–May 2014) monthly stock-return beta to five factors — energy (XLE, XOP), banks (KBE), oil (WTI), and rates (Δ TNX) — each interacted with the corresponding quarterly factor return.	CRSP, FRED
LISCC	Indicator for the largest, most systemically important banks subject to the Large Institution Supervision Coordinating Committee program. Currently includes Bank of America, BNY Mellon, Citi, Goldman, JPM, Morgan Stanley, State Street, Wells Fargo	—

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Table OA1 – continued

Name	Definition	Source
Panel F: Oil-Price Shock and CLO Constraints		
Oil shock exposure	For each CLO, its portfolio holding share in oil-and-gas firms, averaged over January–May 2014 (pre-shock). At the borrower level, the loan-weighted average of its CLOs’ oil-and-gas exposure, weighting by the share of the borrower’s TLBs held by each CLO.	Refinitiv, DealScan
Loan-level Oil-Gas Exposure	For a given loan, the position-weighted average oil-and-gas portfolio share of the CLOs that hold it (pre-shock). Used in the secondary-market fire-sale tests.	Refinitiv, DealScan
High Oil-Gas Exposure	Indicator equal to one for borrowers with above-median Oil shock exposure.	Refinitiv, DealScan
Maturing and Active TLBs	A borrower is <i>Maturing TLB</i> if it has a TLB outstanding as of 2014Q1 with at least one TLB maturing during the oil-price shock (2014Q2–2015Q4), and <i>Active TLB</i> if it has a TLB outstanding as of 2014Q1 with none maturing in that window. Maturity is dated at each tranche’s last pre-shock amendment.	DealScan
Post	Indicator equal to one for quarters after 2014Q1 (the onset of the oil-price shock).	—
Pre-shock issuance gap	Months since the firm’s last DealScan loan origination before 2014Q2.	DealScan
Recent market access	Indicator equal to one for maturing-TLB firms that originated a new TLB in the two years before the shock (June 2012–June 2014).	DealScan
OC cushion (senior/junior)	A CLO’s overcollateralization-test result divided by its required threshold (unit-free), reported separately for the senior and junior/mezzanine OC tests. A value above one means the test passes; the distance to one is the test’s slack.	Creditflux

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Table OA1 – continued

Name	Definition	Source
IC cushion	A CLO's interest-coverage-test result divided by its required threshold (unit-free), defined analogously to the OC cushion.	Creditflux
Slack / distance-to-trigger	A coverage test's cushion minus one — the distance to the covenant trigger.	Creditflux
CCC share	Share of a CLO's portfolio rated CCC+ or below.	Creditflux
Sale Price	Value-weighted average secondary-market sale price of a loan, per \$100 of par.	Refinitiv (LPC Trading Trustee)
Net Volume	Net secondary-market transaction volume in a loan (purchases minus sales), in \$ millions; negative values denote net selling.	Refinitiv (LPC Trading Trustee)
Panel G: Stress-Episode Indicators		
GFC	Equals one between 2007Q2 and 2009Q2.	—
COVID-19	Equals one in 2020Q1.	—

OA1 Additional Figures and Tables

Figure OA1: Growth of Nonbank Lending

This figure plots the quarterly total book value of assets of bank and nonbank borrowers in trillions of dollars. The sample consists of term loan borrowers from 2000 to 2024. 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*.

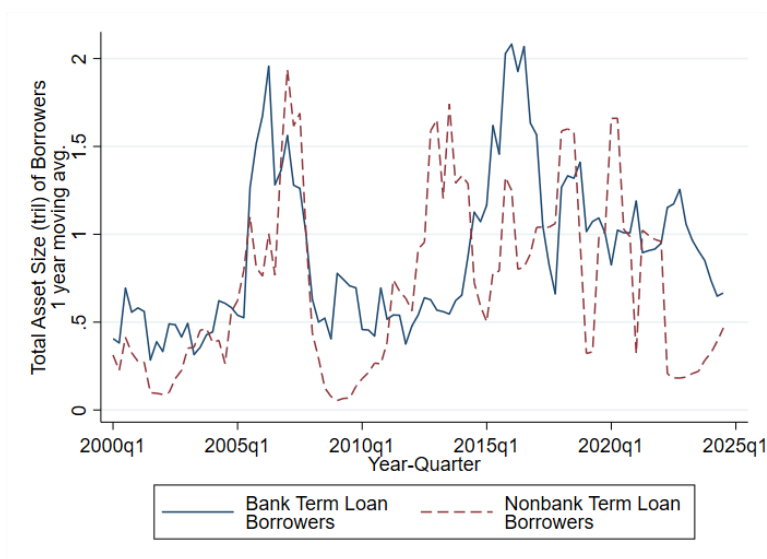


Figure OA2: Comparing loan spreads

This figure plots the average of the difference between the spread on nonbank (TLB) and bank (TLA) term loans to a given borrower in the same package between 2000-2024. Data is from DealScan and spread measures the weighted average all-in-drawn-spread on loans.

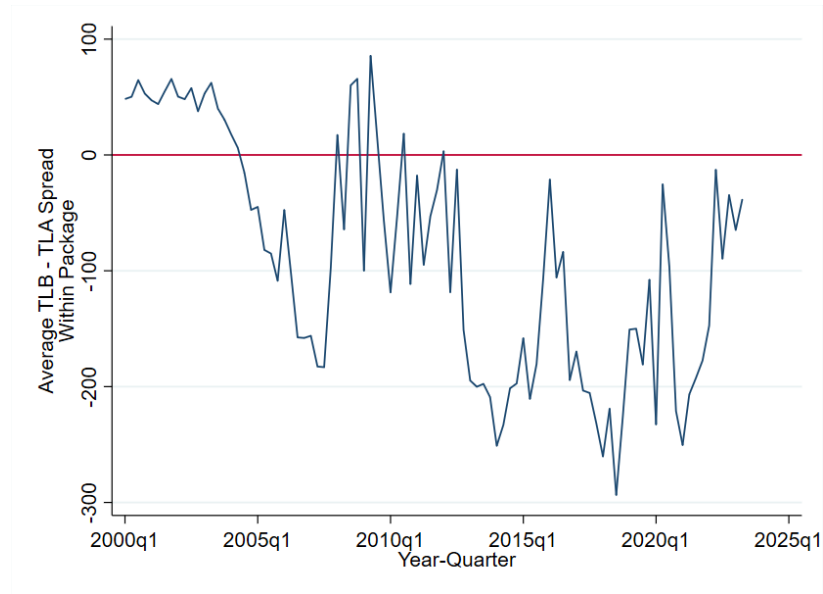
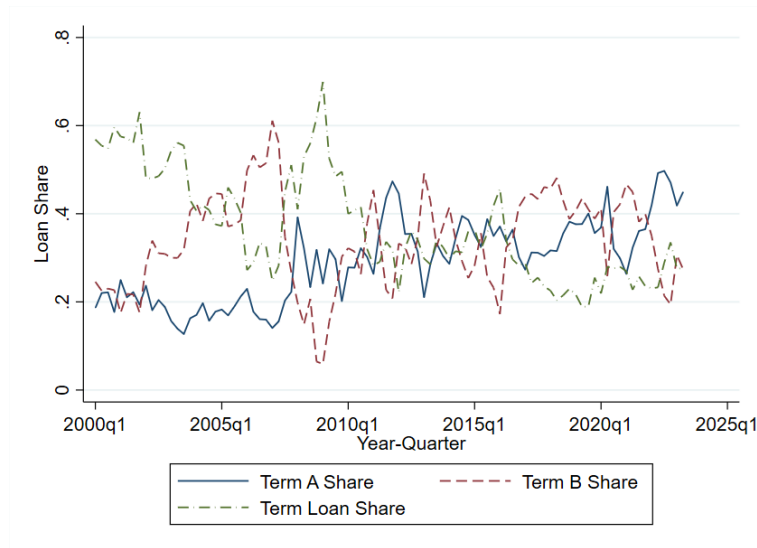


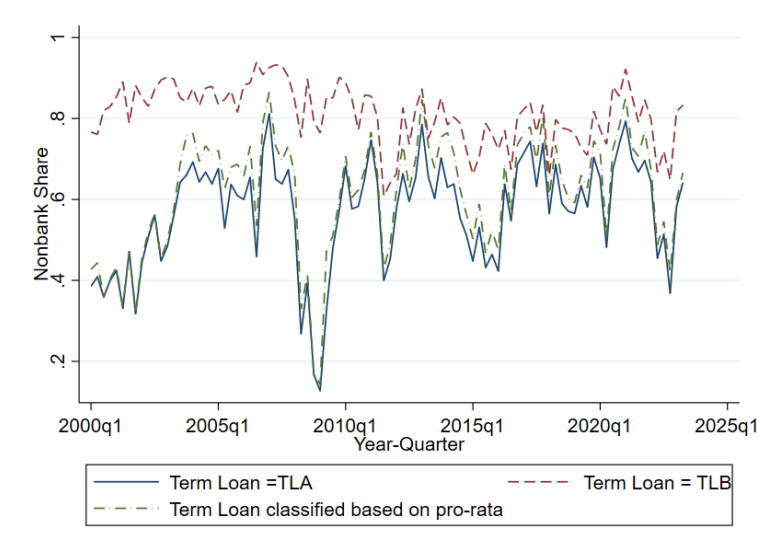
Figure OA3: Alternate Measures of Nonbank Dependence

This figure presents the time-series variation in various loan categories and nonbank dependence. In Panel A, we plot the shares of term loans that are classified as Term Loan A or Term Loan B or remain unclassified in DealScan. In Panel B and C, we show three different classification of nonbank loans - 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 B plots nonbank term loans (defined one of three ways) issued as share of total term loans at origination and Panel C plots nonbank term loans outstanding as a share of total term loans outstanding.

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

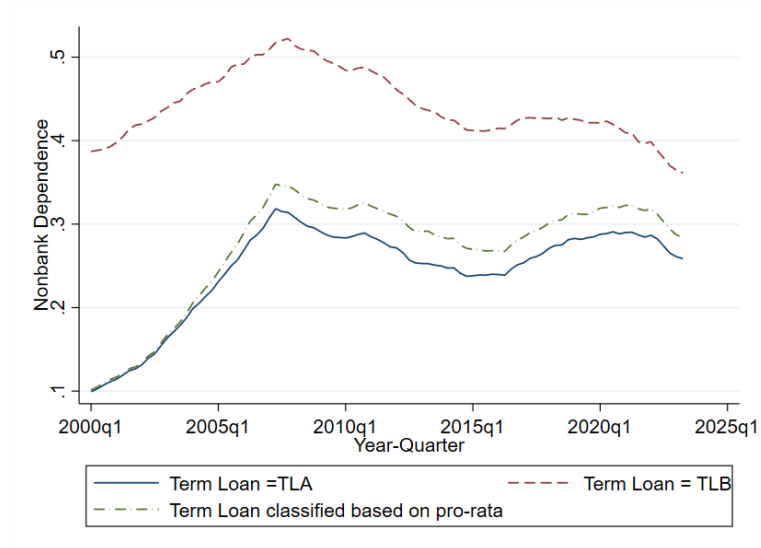


Figure OA4: CL Drawdown by Borrower Rating

This figure shows the average credit line utilization rate (drawn balance/ total commitment) of nonbank borrowers by credit rating. Firms are classified as being *Nonbank Borrowers* if they have an outstanding Term Loan B-K (TLB). *Non-IG* borrowers are ones rated BB or below. Credit line utilization is from CapitalIQ

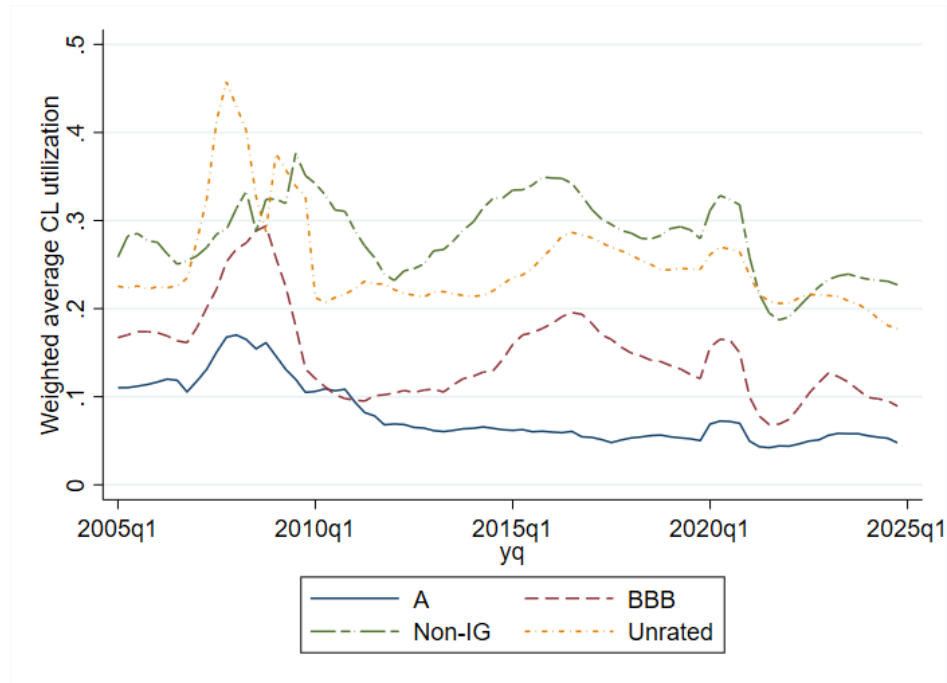


Figure OA5: Credit line issuance over time

This figure plots the quarterly issuance of credit lines to bank and nonbank borrowers. A firm is classified as a nonbank borrower if it has a TLB outstanding in that quarter, and a bank borrower otherwise. Sample period is from 2000 to 2024.

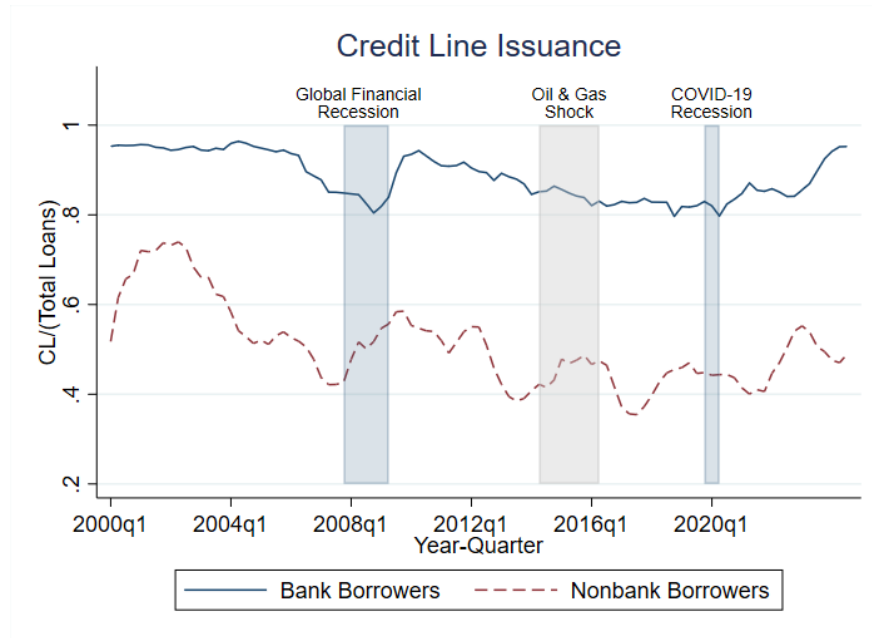
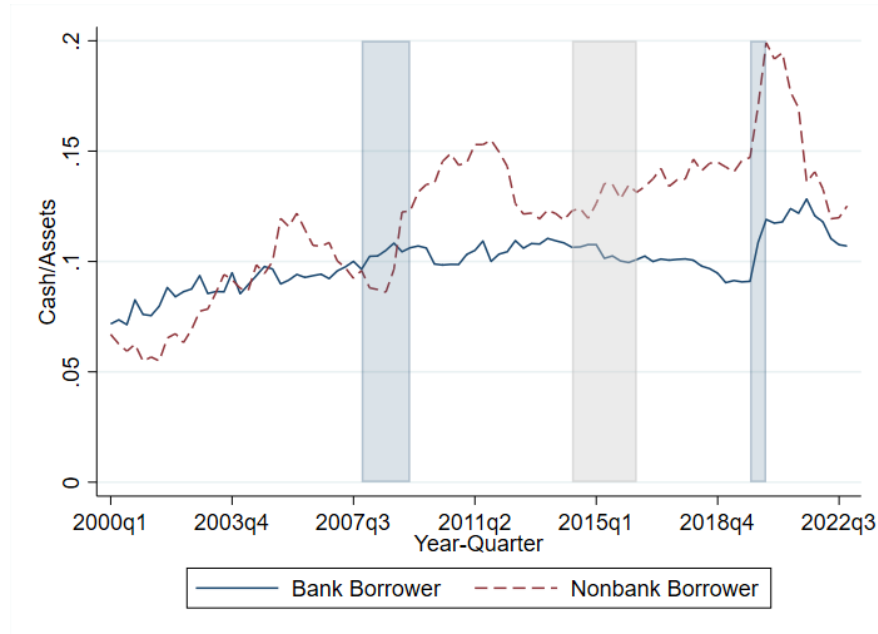


Figure OA6: Liquidity Buffers

This figure plots the quarterly level of cash to assets for bank and nonbank borrowers. A firm is classified as a nonbank borrower if it has a TLB outstanding in a given quarter. Sample period is from 2000 to 2022. Panel A compares cash as a share of total firm assets for bank and nonbank borrowers as of that quarter.

Panel B compares cash as a share of total firm assets over time for firms with a nonbank loan outstanding as of 2007Q4 (pre-GFC).

Panel A - Time-series variation in cash level



Panel B - Based on reliance on nonbanks during GFC

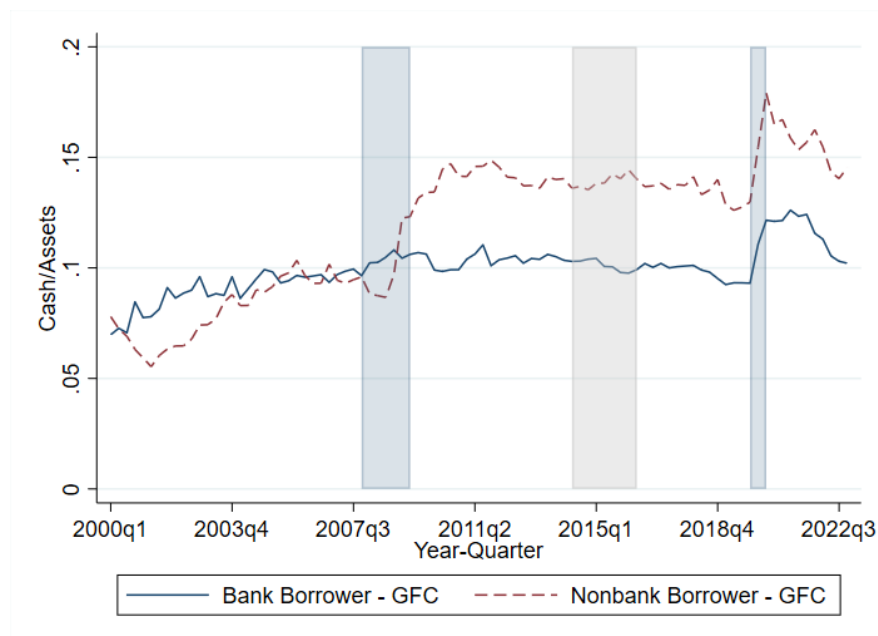
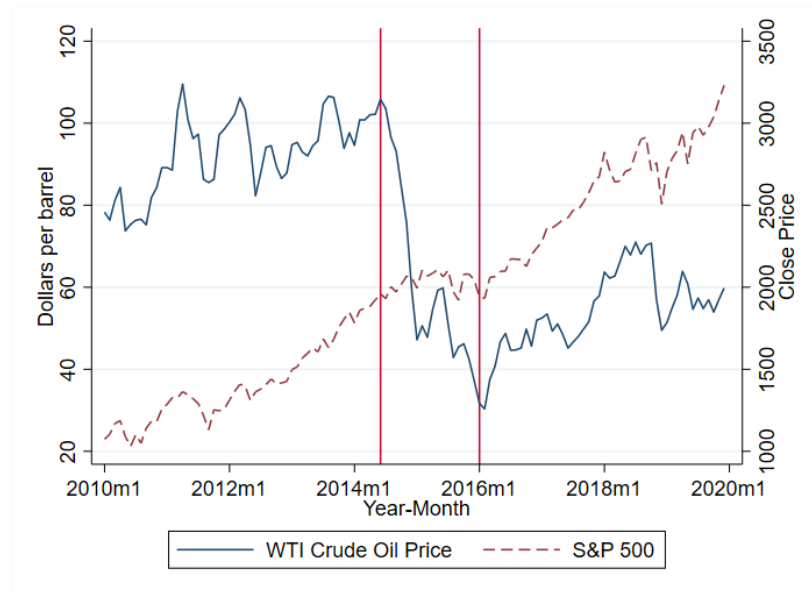


Figure OA7: Price Movements during the 2014-16 Oil Price Shock

Panel A presents the level of oil prices of the West Texas Intermediate (WTI) and the S&P500 index values from 2010 to 2020. Panel B shows the average quote on the leveraged loan market as reported by the Loan Syndications and Trading Association (LSTA) from 2010 to 2017. We plot 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 and Stock Prices



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

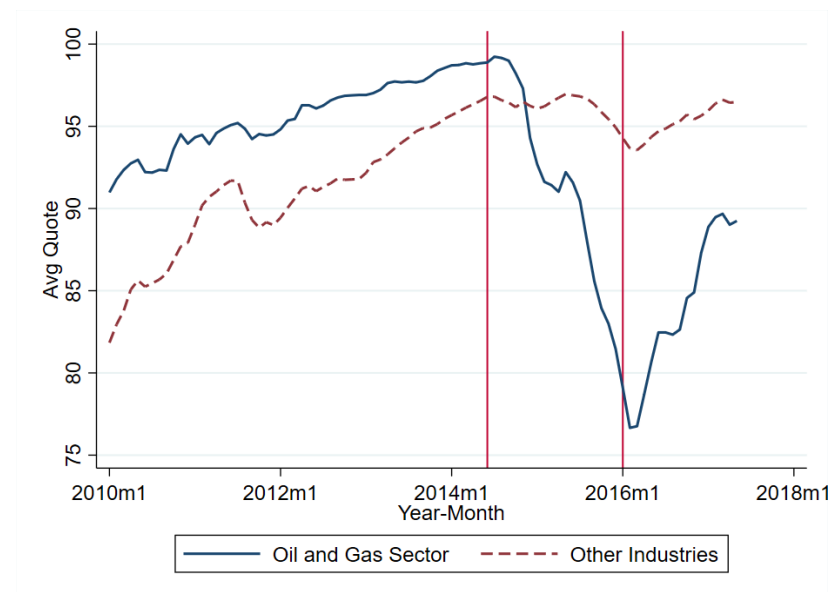
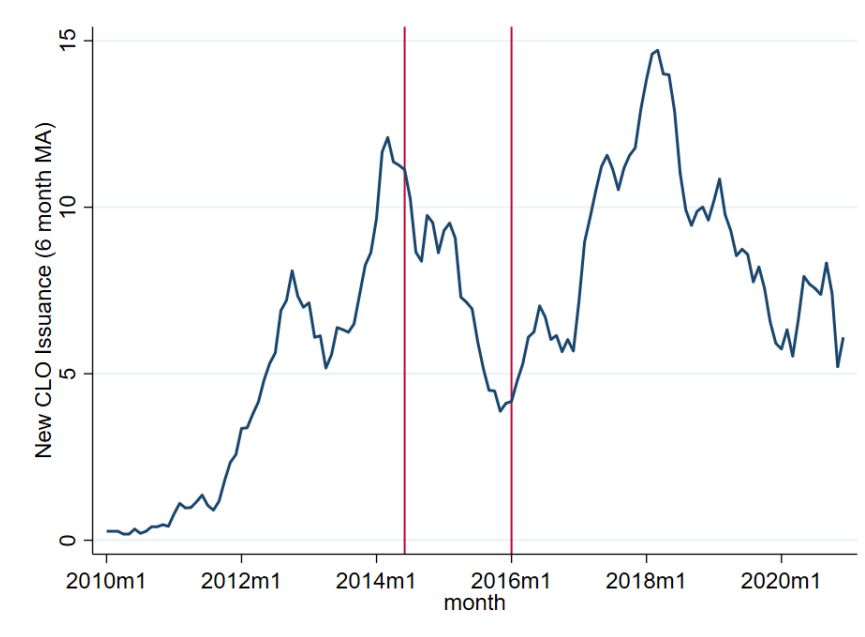


Figure OA8: New CLO Issuance and Loan Originations

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

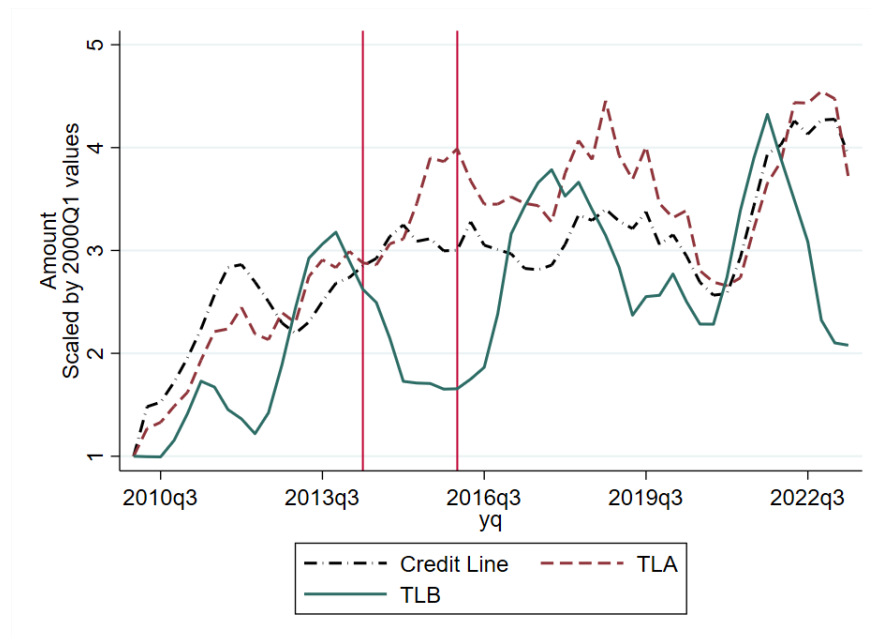
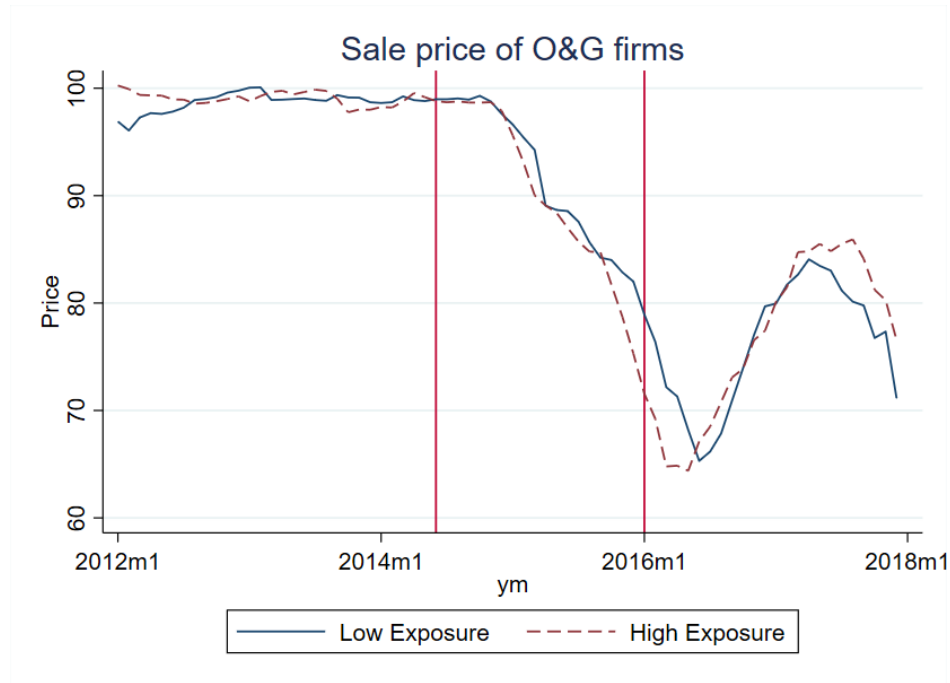


Figure OA9: Oil Shock Exposure - Impact on CLOs

This figure plots the sale price of firms in the oil and gas sector (Panel A) and others (Panel B) between 2012 and 2017 for CLOs with high or low oil gas exposure. *High Exposure* takes a value of one for CLOs with above median oil gas exposure, which is based on the share of a CLO's portfolio in oil and gas firms as of 2014 Q1. 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. Secondary market loan price data is from LSTA.

Panel A - Sale Price - Oil and gas firms



Panel B - Sale Price - Non-oil-and-gas firms

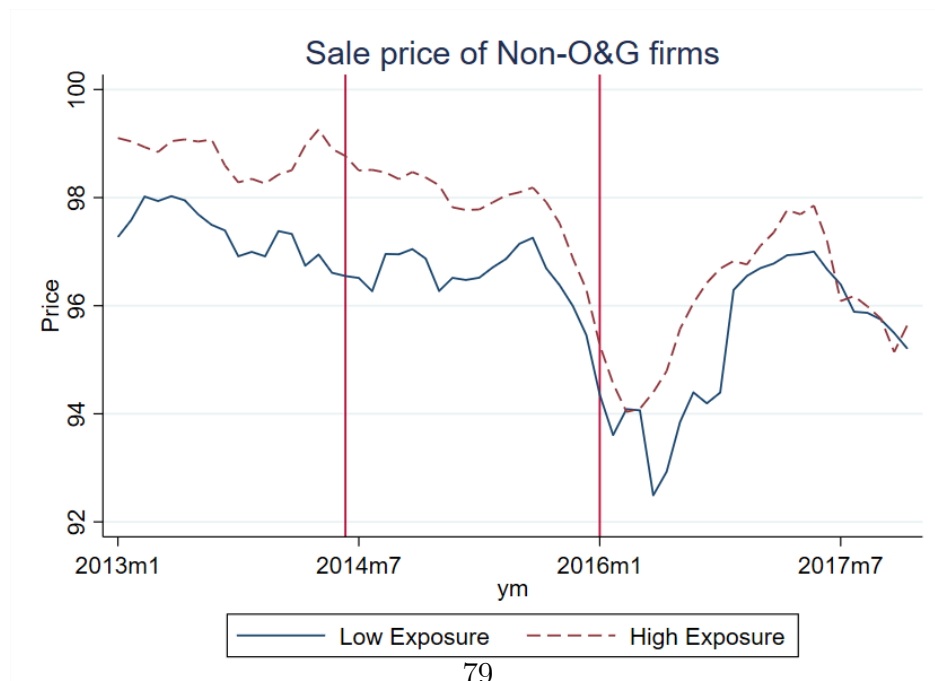


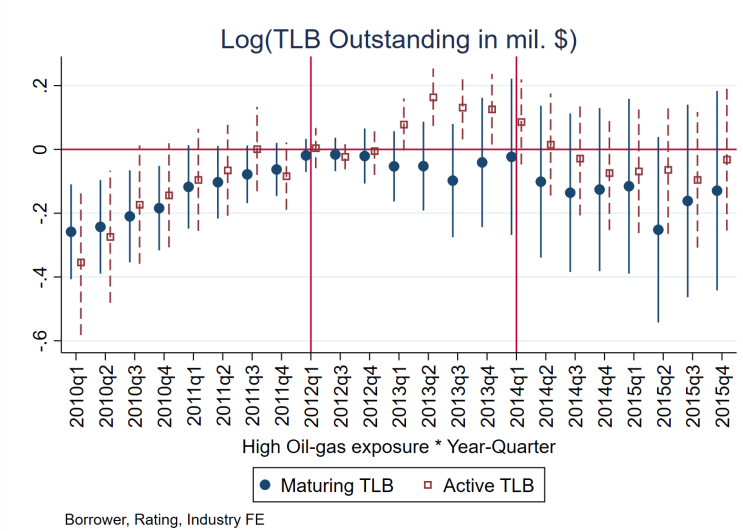
Figure OA10: Borrower Term Loan and Credit Line Access Based on Loan Maturity - Placebo Sample

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

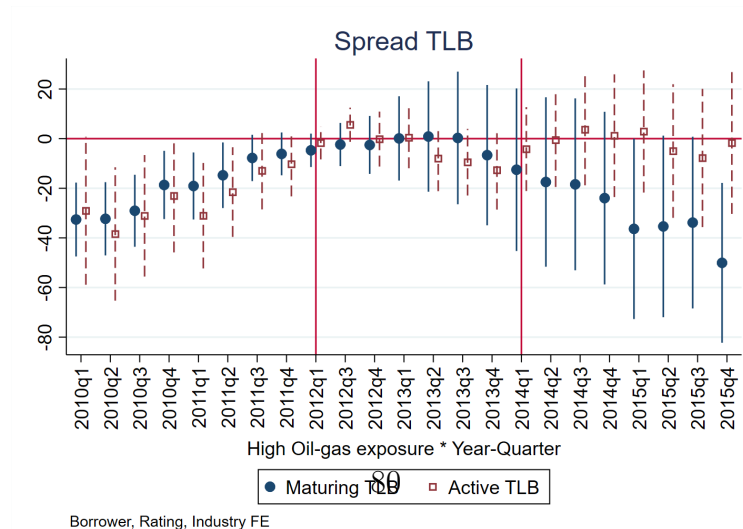
$$y_{i,t} = \alpha + \beta \text{High Oil-Gas Exposure}_i \times \mathbf{1}_t + \lambda_t + \delta_i + \epsilon_{i,t}$$

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 2012 Q1. Firms are classified as being *Active TLB* if they have an outstanding nonbank term loan (TLB) as of 2012Q1 and their TLBs are not maturing during the placebo window of 2012Q2-2014Q1. Coefficients plotted are relative to 2012Q1. We include borrower fixed effects, rating $\times$ year-quarter fixed effects, and two-digit SIC code $\times$ year-quarter fixed effects. Standard errors are clustered at the borrower level and bars denote 90% confidence intervals.

Panel A -TLB Outstanding

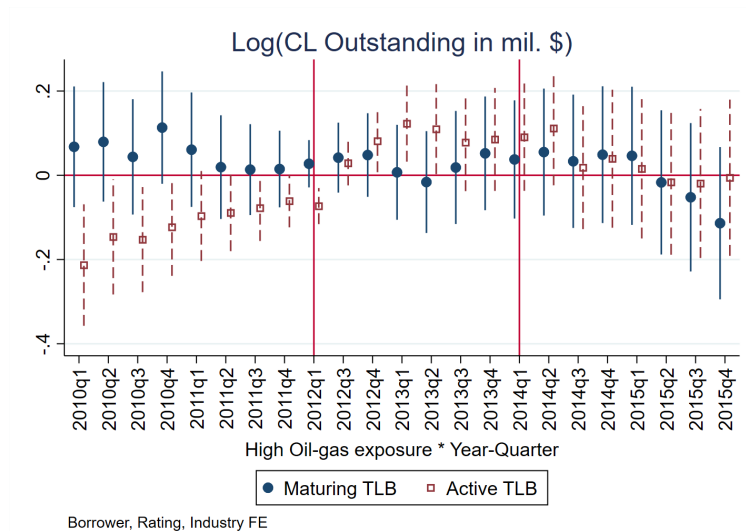


Panel B - TLB Spreads



Borrower Term Loan and Credit Line Access - Placebo Sample - continued

Panel C - Credit Line Outstanding



Panel D - Credit Line Spreads

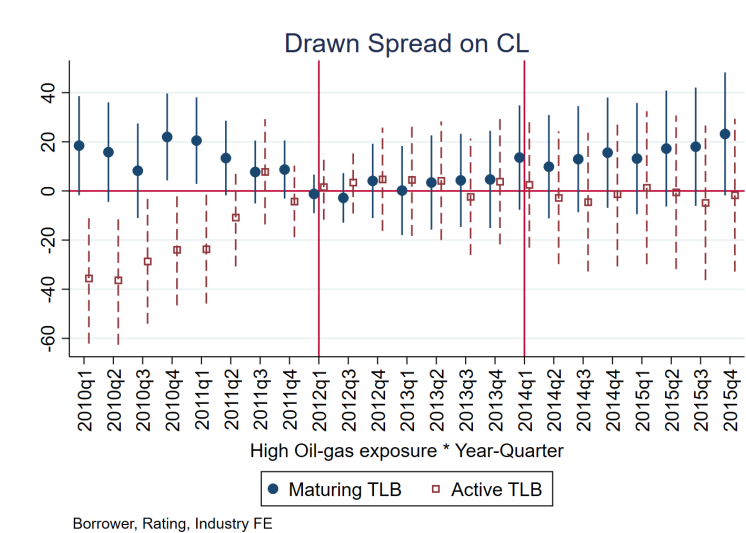
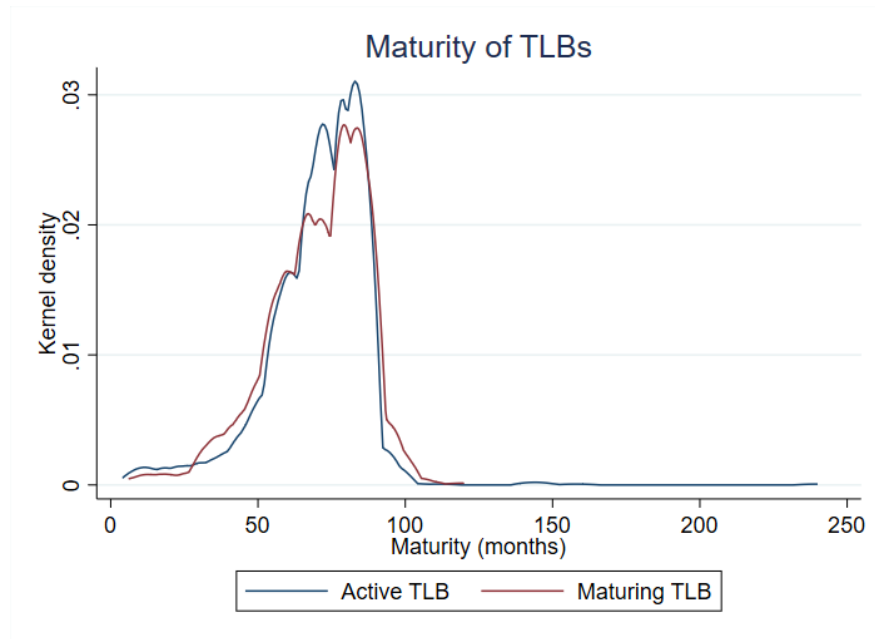


Figure OA11: Comparing the loan maturity of TLB borrowers

This figure presents the kernel density of loan maturity (in months) for TLB borrowers. Sample includes firms with a TLB outstanding 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 2014Q2-2015Q4. 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	70.29	70.35	-0.06
TLA Maturity	60.45	58.28	2.17
CL Maturity	49.05	48.22	0.84
Observations	1136	2917	4053

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	0.0678	0.04	0.0501	0.005

Table OA2: 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 drew down on its credit line during the sample period. *Utilization* is the increase in total credit lines drawn down 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 controls 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*** (0.009)	0.046*** (0.006)	0.061*** (0.013)	0.130** (0.059)
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	0.018	0.019	0.040

Table OA3: 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 (our preferred measure), classifying unclassified term loans as TLBs, or using the pro rata definition to classify the unclassified term loans.

Panel A - Borrower-quarter level

Unclassified term loan	= bank TL	= nonbank TL	based on pro-rata
= bank TL	1		
= nonbank TL	0.552	1	
based on pro-rata	0.962	0.568	1

Panel B - Quarterly level

Unclassified term loan	= bank TL	= nonbank TL	based on pro-rata
= bank TL	1		
= nonbank TL	0.596	1	
based on pro-rata	0.999	0.590	1

Table OA4: 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 between 2000-2024. Data is at the borrower-year-quarter level. *Nonbank Dependence* is a measure of nonbank exposure of the borrower based on the volume of nonbank term loans outstanding as a share of total term loans outstanding in the given quarter for the borrower. In Panel A we measure credit line shares at issuance. Columns 1 to 3 measure credit line as a share of total loans to the borrower. Columns 4-6 measure credit lines as a share of total liquidity (measured by cash plus credit lines). In Panel B we measure loan spreads in basis points. Columns 1 to 3 present results for all-in-spread-drawn on credit lines while Columns 4-6 present results for total cost of borrowing on credit lines.

Loans are classified as TLA or TLB based on the pro-rata definition in DealScan (Columns 1 and 4) or by classifying all unclassified term loans as TLB (Columns 2 and 5). In Columns 3 and 6, we calculate TLA outstanding amounts based on a amortization schedule and create nonbank dependence using outstanding balances on all term loans. We include borrower, borrower rating $\times$ year-quarter fixed effects, two-digit SIC code $\times$ year-quarter fixed effects, and controls for firm size, debt-to-asset ratio, strength of bank-borrower relationship, loan maturity, collateral, 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) Pro-rata	(2) Unclassified=TLB	(3) Amortizing	(4) Pro-rata	(5) Unclassified=TLB	(6) Amortizing
Nonbank Dependence	-0.156*** (0.015)	-0.097*** (0.011)	-0.162*** (0.015)	-0.035*** (0.009)	-0.010 (0.006)	-0.032*** (0.010)
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
Controls	Y	Y	Y	Y	Y	Y
Unconditional mean	0.72	0.72	0.72	0.65	0.65	0.65
Obs.	22,806	22,806	22,806	22,803	22,803	22,803
R ²	0.500	0.499	0.500	0.733	0.733	0.733

Panel B - Credit Line Costs

	AISD (CL)			TCB (CL)		
	(1) Pro-rata	(2) Unclassified=TLB	(3) Amortizing	(4) Pro-rata	(5) Unclassified=TLB	(6) Amortizing
Nonbank Dependence	40.007*** (4.226)	26.048*** (2.474)	41.021*** (4.133)	7.924** (3.863)	1.329 (3.000)	7.924** (3.880)
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
Controls	Y	Y	Y	Y	Y	Y
Unconditional mean	184.93	184.93	184.93	106.06	106.06	106.06
Obs.	20,879	20,879	20,879	6,523	6,523	6,523
R ²	0.754	0.753	0.754	0.819	0.819	0.819

Table OA5: Effect of Nonbank Dependence on Credit Line Access - Other Robustness Tests

This table presents robustness tests on how credit line access varies with nonbank dependence of the borrower under three alternative sample restrictions. Data is at the borrower-year-quarter level. *Nonbank Dependence* is the volume of nonbank term loans (Term Loan B–K) outstanding as a share of total term loans outstanding for the borrower in the given quarter. Columns 1–3 report results for credit line as a share of total loans at issuance; Columns 4–6 report results for the all-in drawn spread on credit lines (bps). Each column applies a different sample restriction: *Unrated* keeps borrowers ever-unrated in the sample period (`rating_num==10` at any point); *TL Borrowers* restricts to firms with positive total term-loan amounts outstanding; *Non-crisis* drops NBER recession quarters and the 2014–2016 oil-price shock window. All specifications include borrower, borrower-rating $\times$ year-quarter, and two-digit SIC $\times$ year-quarter fixed effects, plus controls for firm size, debt-to-asset ratio, strength of bank-borrower relationship, loan maturity, collateral, and deal purpose. Standard errors are clustered at the borrower level. Significance levels: *($p < 0.10$), **($p < 0.05$), ***($p < 0.01$).

	CL/Total Loans at Issuance			All-in Drawn Spread (CL)		
	(1) Unrated	(2) TL Borrowers	(3) Non-crisis	(4) Unrated	(5) TL Borrowers	(6) Non-crisis
Nonbank Dependence	−0.169*** (0.018)	−0.061*** (0.021)	−0.175*** (0.016)	50.466*** (5.058)	35.740*** (7.026)	41.815*** (4.739)
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
Controls	Y	Y	Y	Y	Y	Y
Sample	Unrated ever	TL borrowers	Non-crisis	Unrated ever	TL borrowers	Non-crisis
Unconditional mean	0.73	0.59	0.72	185.69	224.95	182.56
Obs.	17,990	9,904	17,825	16,385	9,047	16,267
R^2	0.503	0.660	0.498	0.759	0.750	0.764

Table OA6: CLO Characteristics by Oil and Gas Exposure (2014Q1)

This table compares CLO portfolio characteristics at 2014Q1 by above- vs. below-median pre-shock oil and gas portfolio share. Portfolio size, number of loans, average credit rating, CCC share, and investment grade share are computed from Creditflux loan-level holdings data. The “Above 7.5% CCC Bucket” indicator flags CLOs exceeding the typical CCC covenant threshold. Significance levels for the difference: *(p<0.10), **(p<0.05), ***(p<0.01).

	Low Oil Exposure		High Oil Exposure		Difference
	Mean	SD	Mean	SD	Diff
Portfolio Size (<i>mm</i>)	1625.620	2142.387	1878.217	1174.154	-252.597
Number of Loans	486.774	367.153	625.629	427.910	-138.855**
Avg Rating (14=B+)	14.462	1.583	14.141	0.450	0.321*
CCC Share	0.097	0.203	0.041	0.046	0.057**
B– or Below Share	0.182	0.207	0.126	0.074	0.056**
Investment Grade Share	0.042	0.051	0.036	0.029	0.007
Above 7.5% CCC Bucket	0.209	0.408	0.106	0.309	0.103*
O&G Portfolio Share	0.011	0.009	0.047	0.016	-0.036***
Observations	177		132		309

Table OA7: Oil Shock - Other Robustness Tests

This table presents two additional robustness tests for the oil-shock effect on borrower credit access. Data is at the borrower $\times$ quarter level for the oil-shock sample (2012Q1–2017Q4). TLB Vol. is the log of volume of TLB issued in the quarter. CL Out. is the total volume of CL outstanding in the quarter. TLB (CL) spreads are weighted average spread of TLB (CL) outstanding. Panel A controls for the borrower’s pre-shock issuance gap — the time elapsed since the firm’s most recent loan origination as of 2014Q1 — interacted with Post, to rule out a mechanical effect from differences in refinancing schedules. Panel B restricts the sample to firms with an active credit line outstanding at 2014Q2 (shock onset), so that the estimated effect captures changes for borrowers already inside a banking relationship rather than entry/exit decisions. Both panels report the triple interaction $Oil \times Post \times Mat\ TLB$ on the standard outcome set. Borrowers in the oil-and-gas sector are excluded. All specifications include borrower, rating, and year-quarter fixed effects. Standard errors are clustered at the borrower level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - Controlling for Pre-Shock Issuance Gap

	Baseline				Controlling for Pre-Shock Issuance Gap $\times$ Post			
	(1) TLB Vol.	(2) Spread TLB Out.	(3) CL Vol.	(4) Spread CL Out.	(5) TLB Vol.	(6) Spread TLB Out.	(7) CL Vol.	(8) Spread CL Out.
Oil $\times$ Post $\times$ Mat TLB	-0.094*** (0.035)	8.631** (4.028)	-0.094*** (0.033)	8.500** (4.094)	-0.087** (0.035)	8.676** (4.020)	-0.087*** (0.032)	8.517** (4.110)
Gap $\times$ Post					0.004** (0.002)	0.135 (0.177)	0.006*** (0.002)	0.008 (0.211)
Borrower FE	Y	Y	Y	Y	Y	Y	Y	Y
Rating FE	Y	Y	Y	Y	Y	Y	Y	Y
Yr-Qtr FE	Y	Y	Y	Y	Y	Y	Y	Y
Gap $\times$ Post					Y	Y	Y	Y
Obs.	10,354	8,246	10,354	8,697	10,183	8,123	10,183	8,608
R-squared	0.149	0.866	0.087	0.802	0.150	0.866	0.088	0.802

Panel B - Active Credit Line at Shock Onset Only

	Full Sample				Active CL at Shock Onset Only			
	(1) TLB Vol.	(2) Spread TLB Out.	(3) CL Vol.	(4) Spread CL Out.	(5) TLB Vol.	(6) Spread TLB Out.	(7) CL Vol.	(8) Spread CL Out.
Oil $\times$ Post $\times$ Mat TLB	-0.107*** (0.036)	8.656** (4.031)	-0.095*** (0.033)	7.507* (4.111)	-0.098*** (0.038)	7.691* (4.198)	-0.098*** (0.035)	7.831* (4.097)
Borrower FE	Y	Y	Y	Y	Y	Y	Y	Y
Rating FE	Y	Y	Y	Y	Y	Y	Y	Y
Yr-Qtr FE	Y	Y	Y	Y	Y	Y	Y	Y
Obs.	9,468	8,149	9,468	7,967	8,571	7,494	8,571	7,736
R-squared	0.144	0.864	0.090	0.791	0.143	0.862	0.084	0.794

Table OA8: Placebo: Rollover Risk from Maturing Bank Term Loans (TLA)

This table repeats the oil-shock triple-difference specification of Table 6 but defines rollover risk from bank term loans (TLA) rather than nonbank term loans (TLB). *Maturing TLA* flags borrowers with a Term Loan A maturing during the oil-price shock window (2014Q2–2015Q4). Panel A restricts the sample to borrowers with at least one TLA outstanding as of 2014Q1 and reports the single triple interaction Oil-Gas Exposure $\times$ Post $\times$ Maturing TLA. Panel B runs a horse race on the union of TLB and TLA borrowers, including both Oil-Gas Exposure $\times$ Post $\times$ Maturing TLB and Oil-Gas Exposure $\times$ Post $\times$ Maturing TLA in the same regression. Columns report the volume and spread of nonbank term loans (TLB), bank term loans (TLA), total term loans, and credit lines (new issuance per quarter, outstanding stock, and drawn spread). We include borrower, industry, rating, and year-quarter fixed effects in all specifications. Standard errors are clustered at the borrower level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - Maturing TLA only (TLA-borrower sample)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	TLB Vol.	Spread TLB	TLA Vol.	Spread TLA	Term Vol.	CL Vol.	CL Out	Spread CL
Oil Exp $\times$ Post $\times$ Mat TLA	-0.051 (0.039)	-0.512 (8.095)	0.024 (0.035)	11.067* (5.929)	-0.046 (0.046)	-0.025 (0.040)	-0.052 (0.041)	4.624 (3.823)
Obs.	15,681	4,822	15,681	11,473	15,681	15,681	14,016	13,517
R^2	0.183	0.868	0.081	0.904	0.115	0.072	0.897	0.841

Panel B - Horse race: Maturing TLB vs. Maturing TLA (union sample)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	TLB Vol.	Spread TLB	TLA Vol.	Spread TLA	Term Vol.	CL Vol.	CL Out	Spread CL
Oil Exp $\times$ Post $\times$ Mat TLA	-0.095** (0.043)	11.931** (5.637)	-0.100*** (0.033)	15.368* (7.964)	-0.178*** (0.048)	-0.116*** (0.041)	-0.122** (0.056)	10.950** (5.258)
Oil Exp $\times$ Post $\times$ Mat TLB	-0.031 (0.034)	-3.637 (7.863)	-0.016 (0.031)	9.083 (6.159)	-0.033 (0.039)	-0.022 (0.036)	-0.015 (0.037)	5.216 (3.628)
Obs.	19,687	8,229	19,687	11,984	19,687	19,687	17,336	16,652
R^2	0.170	0.871	0.086	0.910	0.117	0.074	0.891	0.824

Table OA9: Oil Price Shock - Covariate Balance and Coefficient Stability under Entropy Reweighting

This table addresses the concern that borrowers whose loans are held by high- versus low-oil-exposure CLOs differ on pre-shock characteristics (Table 5). We entropy-balance (Hainmueller, 2012) the two groups on five pre-shock (2014Q1) firm fundamentals — *Nonbank Dependence*, *Total Debt/Assets*, *Cash/Assets*, *Log(Assets)*, and a *Share Unrated* indicator — reweighting low-exposure borrowers so that the weighted means of all five covariates equal those of the high-exposure group. Panel A reports covariate means for high- and low-exposure borrowers before (*Unweighted*) and after (*Entropy-reweighted*) weighting; *Diff.* is the high-minus-low difference from a two-sample *t*-test on the unweighted means. Panel B re-estimates the Table 6 Panel A triple difference (the coefficient on Oil-Gas Exposure $\times$ Post $\times$ Maturing TLB): Column (1) is the full-sample baseline; Column (2) restricts to the balanced sample without weights (isolating sample composition); Column (3) applies the entropy weights (isolating reweighting). We include borrower, industry, rating, and year-quarter fixed effects in all specifications on Panel B. Standard errors are clustered at the borrower level. Significance: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - Covariate balance, before and after reweighting

Covariate	High	Unweighted		Entropy-reweighted	
	Oil	Low Oil	Diff.	Low Oil	Diff.
Nonbank Dependence	0.821	0.722	0.099***	0.821	0.000
Total Debt/Assets	0.491	0.357	0.134***	0.491	0.000
Cash/Assets	0.072	0.109	-0.036***	0.073	-0.000
Log(Assets)	1.119	0.849	0.271	1.119	0.001
Share Unrated	0.260	0.319	-0.060	0.260	-0.000

Panel B - Triple-difference coefficient under reweighting

	(1) Baseline (full)	(2) Balanced (unweighted)	(3) Balanced (weighted)
Log(New TLB Vol.)	-0.137*** (0.047)	-0.139*** (0.047)	-0.144*** (0.050)
TLB Spread (bps)	11.222** (5.244)	11.099** (5.317)	10.329* (6.002)
Log(New TLA Vol.)	-0.088** (0.035)	-0.089** (0.035)	-0.083** (0.034)
TLA Spread (bps)	17.738** (8.546)	18.199** (8.682)	14.711 (9.448)
Log(New Term Vol.)	-0.194*** (0.052)	-0.196*** (0.052)	-0.200*** (0.053)
Log(New CL Vol.)	-0.120*** (0.043)	-0.117*** (0.044)	-0.133*** (0.045)
Log(CL Outstanding)	-0.171*** (0.056)	-0.172*** (0.057)	-0.112* (0.058)
CL Drawn Spread (bps)	10.169* (5.210)	10.730** (5.260)	10.509** (5.314)
Borrowers	524	376	376

Table OA10: Oil Price : Bank Constraints Mechanism

This table tests the bank-rationing mechanism inside the oil-price-shock design at the bank-borrower-year-quarter level, over 2012Q1–2017Q4. *Oil* is the standardized CLO oil-and-gas exposure of the borrower, *Post* indicates 2014Q2 onward, and *Mat-TLB* indicates a borrower with a Term Loan B-K maturing during the shock window (active-TLB borrowers are the comparison group). All columns include bank $\times$ year-quarter and borrower fixed effects. Columns 2–6 additionally include rating $\times$ year-quarter and industry (SIC2) $\times$ year-quarter fixed effects. Columns 3–4 (5–6) split banks at the within-sample median of their pre-shock (2014Q1) liquidity ratio (Tier-1 capital ratio). Panel A is credit line outstanding, measured as $\log(1 + \text{CL})$ on the filled bank-borrower relationship panel from the first observed relationship onward, so commitment run-offs and non-renewals enter as zeros (extensive margin). Panel B is the amount-weighted all-in-drawn spread (bps) on quarters with positive outstanding. Standard errors are two-way clustered by borrower and bank. *, **, and *** denote significance at the 10%, 5%, and 1% levels.

Panel A - Credit Line Outstanding

	Pooled		By Bank Liquidity		By Bank Capital	
	(1) Base FE	(2) +Rating,SIC	(3) Low	(4) High	(5) Low	(6) High
Oil $\times$ Post $\times$ Mat-TLB	-0.165** (0.066)	-0.136* (0.072)	-0.086 (0.082)	-0.090 (0.066)	-0.064 (0.061)	-0.115 (0.073)
Observations	141920	141906	18994	36517	28499	24782
Bank x YQ FE	Y	Y	Y	Y	Y	Y
Borrower FE	Y	Y	Y	Y	Y	Y
Rating x YQ FE	N	Y	Y	Y	Y	Y
Industryx YQ FE	N	Y	Y	Y	Y	Y

Panel B - Credit Line Drawn Spread

	Pooled		By Bank Liquidity		By Bank Capital	
	(1) Base FE	(2) +Rating,SIC	(3) Low	(4) High	(5) Low	(6) High
Oil $\times$ Post $\times$ Mat-TLB	8.765** (3.638)	4.281 (3.365)	9.270*** (3.139)	1.812 (3.641)	6.505* (3.516)	1.341 (3.128)
Observations	110668	110658	15994	28303	23273	19265
Bank x YQ FE	Y	Y	Y	Y	Y	Y
Borrower FE	Y	Y	Y	Y	Y	Y
Rating-Qtr FE	No	Yes	Yes	Yes	Yes	Yes
Industry-Qtr FE	No	Yes	Yes	Yes	Yes	Yes

Table OA11: Oil Shock: Debt and Equity Issuance Outcomes

This table examines whether firms with maturing TLBs substitute into alternative debt or equity financing during the oil shock for non-oil-gas borrowers. The specification is Oil Exp $\times$ Post $\times$ Mat TLB with borrower, rating, and year-quarter fixed effects. Debt outcomes: net long-term debt issuance/assets, change in LT debt/assets, change in current debt/assets, log LT debt. Equity outcomes: change in book equity/assets, net equity issuance/assets, change in shares outstanding, log book equity. All flow variables quarterized from Compustat year-to-date items. Standard errors clustered at borrower level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

	Net LT Debt Iss./Assets	Δ LT Debt/Assets	Δ Curr. Debt/Assets	Log(LT Debt)	Δ Book Eq./Assets	Net Eq. Iss./Assets	Δ Shares (%)	Log(Book Eq.)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Oil Exposure x Post x Maturing	0.000	0.000	0.001	0.006	0.002	0.001	0.002	-0.058
TLB	(0.001)	(0.002)	(0.001)	(0.046)	(0.001)	(0.001)	(0.002)	(0.036)
Observations	7008	6930	2374	7631	6951	6947	6957	6628
Borrower 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
R^2	0.087	0.076	0.037	0.912	0.119	0.217	0.137	0.907

Table OA12: Borrower Credit Access and Real Outcomes vs. Nonbank Dependence - Oil Price Shock

This table compares the access to credit and real outcomes for bank and nonbank dependent borrowers during the oil price shock. Sample period is from 2012Q1 - 2017Q4. *Pre-shock 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 for a borrower as of 2014Q1. *Post* takes a value of one after 2014Q2. *Log(New CL)* is the log of 1 + volume of new credit lines originated in a given quarter. *Log(CL outstanding)* is the log of credit lines outstanding for a borrower in a given quarter. *Log(Assets)* is the log of size of the borrower. *LT Inv/ Assets* is long term investments of the borrower scaled by firm size. *Cash/Assets* is cash and cash equivalents as a share of total firm assets. *Capital/Assets* is the invested capital as a share of firm assets. *Log(Cash)* is the log of cash and cash equivalents at the firm. *Cash/(Cash + CL)* is share of cash in total liquidity available at the firm. We exclude borrowers in the oil and gas sector. We include borrower, year-quarter, and rating fixed effects. 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(New CL)	Log(CL Outstanding)	Log(Assets)	LT Inv/Assets	Cash/Assets	Capital/Assets	Log(Cash)	Cash/(Cash +CL)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Pre-shock Nonbank Dependence x	-0.288***	-0.130***	-0.092***	-0.018***	-0.019***	-0.163**	-0.051	0.030**
Post	(0.044)	(0.048)	(0.023)	(0.005)	(0.006)	(0.077)	(0.041)	(0.013)
Borrower 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.	51,838	33,657	49,419	36,428	46,637	46,761	48,984	49,143
R ²	0.088	0.920	0.980	0.738	0.520	0.898	0.914	0.841

Table OA13: Summary Statistics - Bond Borrowers

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 bond borrowers. Panel B presents results separately for bank, bond, and nonbank borrowers. A borrowers with only bank loans (Term Loan A or credit line) is classified as a bank borrower. A borrowers is classified as a nonbank borrower if it has any nonbank term loans (Term Loans B-K) outstanding in the given quarter. Bank and nonbank borrowers are restricted to firms without bonds outstanding. A borrower with bonds outstanding but no nonbank loans outstanding is classified as a bond borrower. *Nonbank Dependence* is the share of term loans to the borrower from nonbanks. *Bond/Assets* is the level of total bonds outstanding as a share of firm assets. *Bond/Total Debt* is the level of total bonds outstanding as a share of total firm debt. *Assets* are the average firm asset size from Compustat. *Total Liabilities/Assets* is total firm liabilities to assets. *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. *Share unrated firms* is the share of all firms without ratings in CapitalIQ. *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. *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 drawn down 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 - Bond Borrowers

	Mean	Std. Dev
Nonbank Dependence	0.19	0.36
Bond/ Assets	0.23	0.16
Bond/ Total Debt	0.37	0.22
Assets (\$ bil.)	16.50	86.49
Total Liabilities/Assets	0.63	0.23
Debt/Assets	0.36	0.20
Cash/Assets	0.09	0.11
Share unrated firms	0.32	0.47
Credit Line >0	0.96	0.19
Credit Line/Total Loans	0.76	0.32
Credit Line/(Credit Line + Cash)	0.68	0.29
Drawn Spread - CL (bps)	173.18	100.05
Undrawn Spread - CL (bps)	28.11	19.37
Drawn credit line (\$ mil.)	120.90	262.27
Credit line commitment (\$ mil.)	960.32	1,279.22
Credit line utilization	0.18	0.26
Observations	67287	

Summary Statistics - continued

Panel B - Comparing Bank, Bond, and Nonbank Borrowers

	Bank Borrower		Bond Borrower		Nonbank Borrower	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Nonbank Dependence	0.00	0.00	0.00	0.00	0.76	0.27
Bond/ Assets	0.00	0.00	0.23	0.16	0.00	0.00
Bond/ Total Debt	0.00	0.00	0.37	0.22	0.00	0.00
Assets (\$ bil.)	4.00	28.80	14.38	48.39	6.85	73.52
Total Liabilities/Assets	0.57	0.29	0.60	0.21	0.77	0.36
Debt/Assets	0.27	0.23	0.33	0.18	0.47	0.29
Cash/Assets	0.11	0.15	0.09	0.11	0.08	0.11
Share unrated firms	0.75	0.43	0.35	0.48	0.50	0.50
Credit Line >0	0.95	0.21	0.98	0.15	0.93	0.26
Credit Line/Total Loans	0.85	0.28	0.89	0.23	0.38	0.26
Credit Line/(Credit Line + Cash)	0.71	0.30	0.69	0.27	0.73	0.31
Drawn Spread - CL (bps)	174.86	108.99	154.95	89.13	251.86	105.22
Undrawn Spread - CL (bps)	29.81	22.23	24.49	17.43	45.36	22.03
Drawn credit line (\$ mil.)	73.90	182.22	119.10	252.44	83.18	225.68
Credit line commitment (\$ mil.)	388.27	758.70	1010.30	1295.33	341.87	700.63
Credit line utilization	0.25	0.30	0.18	0.26	0.21	0.28
Observations	93600		50853		31154	