Shadow Always Touches the Feet: Implications of Bank Credit Lines to Non-Bank Financial Intermediaries

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Abstract

Using real estate investment trusts (REITs) that invest in commercial real estate (CRE) as a leading example, we study the implications for banks of extending credit lines to "shadow banks" or non-bank financial intermediaries (NBFIs). While small and mid-size banks hold an economically significant direct exposure in CRE term loans, a significant part of the CRE exposure of large banks is indirect via credit-line provision to REITs. Utilization of credit lines by REITs tends to be substantially more sensitive to market stress than non-financial corporates and other NBFIs. In turn, large banks suffer drawdowns and equity corrections in stress times from extending credit lines to REITs. Ignoring this NBFI credit line channel understates the exposure of large banks to stress. We propose a methodology to incorporate this exposure and its heterogeneity in bank capital stress tests.

JEL classification: G01, G21, G23
Keywords: shadow banks, NBFIs, commercial real estate, CRE, real estate investment trust (REIT), systemic risk, bank capital, stress tests

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1 Introduction

In recent years, banks' credit line exposure to "shadow banks", or which we will equivalently refer to as non-bank financial institutions (NBFIs), has grown significantly faster than to non-financial corporations. Between 2013 and 2023, bank credit lines to NBFIs tripled from $500 billion to $1.5 trillion, and in 2023 over 20% of all bank credit lines were committed to NBFIs, increasing from 15% in 2013 (Acharya, Cetorelli, and Tuckman, 2024a). How do the growing linkages between banks and NBFIs impact performance and systemic stability of banks? We answer this question by studying as an important leading example one type of NBFI, viz., Real Estate Investment Trusts (REITs).

We focus on REITs for several reasons. First, the majority of REITs are publicly traded, giving us a detailed view of their debt and investments. Indeed, REITs are significant investors in commercial real estate (CRE), with over $4 trillion in investments corresponding to 20% of the CRE market that is currently valued at $21 trillion.[1] Rising interest rates and an economic slowdown can therefore exert considerable pressure on the CRE sector.[2] Considering the vast scale of the CRE market, disruptions in the CRE sector can influence the availability of bank credit to households and businesses.[3] Consequently, regulators and policymakers have increasingly focused on the risks associated with CRE loans in recent times. REITs, being a large CRE investor, inherit these fundamental economic and financial risks.

Second, nearly half of all bank-originated credit lines to public NBFIs are allocated to REITs. As shown in Figure 1, REITs exhibit significantly higher utilization rates on bank credit lines compared to other NBFIs and non-financial corporates. Moreover, their credit

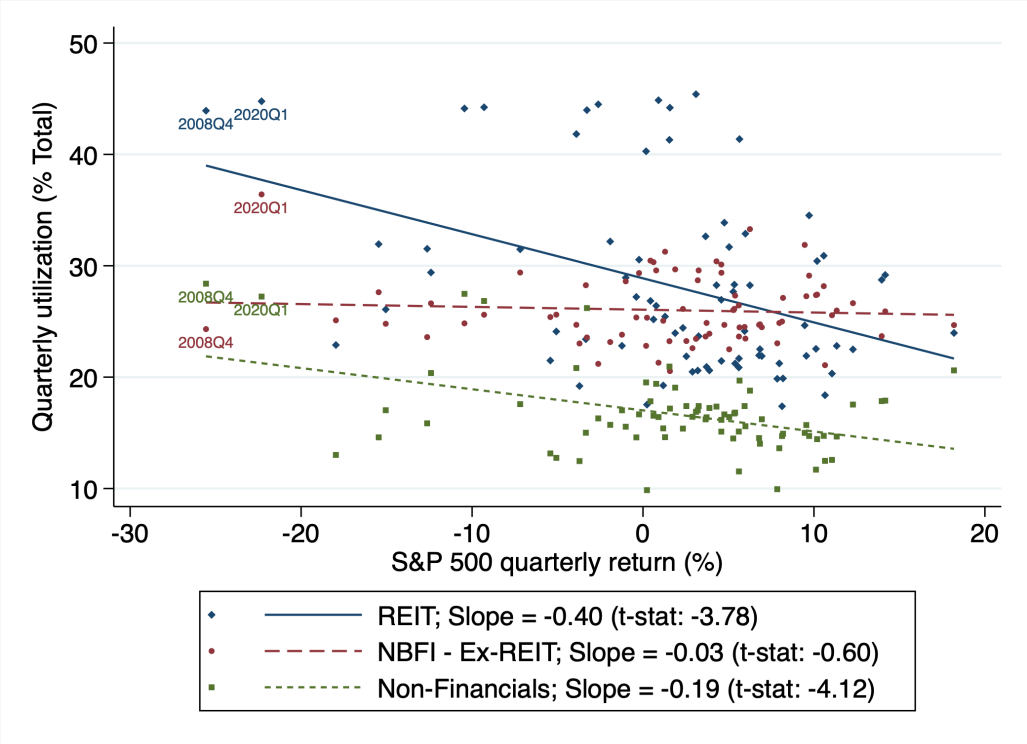
[1] https://www.reit.com/data-research/research/nareit-research/estimating-size-commercial-real-estate-market-us-2021.About $2.5 trillion of these are held by public REITs. Source - https://www.reit.com/data-research/data/reits-numbers

[2] For instance, commercial property prices dropped about 10% between January 2020 and December 2023, initially due to the structural impact of COVID-19 and 21% since the Federal Reserve started raising interest rates in March 2022, with the latter correction erasing the property price appreciation over the preceding two years. Source - Green Street Commercial Property Price Index https://www.greenstreet.com/insights/CPPI

[3] For example, Cole and White (2012) document the impact of CRE investments on bank failures historically (1985-1992 and 2009).

line usage is markedly more sensitive to aggregate market performance, as indicated by the slope coefficients in the figure. Notably, REIT utilization rates spike during periods of market stress (such as during the COVID-19 period), making credit lines to REITs a potentially significant source of systemic risk for banks.

Figure 1: Credit line utilization a function of aggregate market performance



This figure plots the average credit line utilization rate by three groups of borrowers – REITs, NBFIs (excluding REITs), and non-financial companies – versus the S&P 500 return. Each dot indicates the utilization rate in one of the quarters between 2005Q1 and 2023Q4. The dots for 2008Q4 and 2020Q1 are labeled to highlight the main crisis quarters. The solid blue line indicates the slope of a regression of utilization rates onto the S&P 500 return for REITs, the dashed red line and the green dotted line indicate the respective slope of the same regression for NBFIs excluding REITs and non-financial companies. Data is obtained from Capital IQ and CRSP.

Finally, despite these factors, the significant exposure of *large* banks to the CRE sector via their credit lines to REITs is often underappreciated. In particular, it is commonly

assumed that disruptions in the CRE sector mainly affect smaller banks. Figure 2 illustrates, using data from Federal Deposit Insurance Corporation (FDIC) Call Reports, the on-balance sheet exposure in the form of CRE loans in absolute value (Panel A) and as a proportion of total equity (Panel B) over the past decade for three types of banks: community banks (assets under $10 billion), regional banks (assets between $10 billion and $100 billion), and large banks (assets exceeding $100 billion).[4] The exposure of regional and community banks, when scaled by equity in Panel B, is approximately 4 and 5 times greater, respectively, than that of large banks. As per this exposure measure, there has been a notable increase over the past decade in CRE loan exposure among regional and, especially, community banks, but not among large banks.[5] This might suggest that the CRE stress does not pose systemic risk to the largest banks in the economy.

However, these figures ignore loans and credit lines provided by banks to REITs. The primary conclusion that emerges from our empirical analysis is that in order to get a complete picture of bank exposure to CRE risks, it is important to focus not just on the *direct* CRE exposure of banks but also on the provision of credit, especially by large banks, to REITs. Once the *indirect* exposure of banks via term loans and credit lines to REITs is accounted for, CRE exposures are concentrated not only in the portfolios of smaller banks but also among the largest U.S. banks. Figure 3 illustrates this fact. In this figure, we categorize bank exposure into direct CRE exposure, indirect exposure via term loans to REITs, and indirect exposure through credit lines to REITs.[6] For large banks, indirect exposure constitutes about a third of their total exposure, whereas for regional banks, the indirect exposure through REITs is considerably smaller, and for community banks, it is practically negligible.

What are then the underlying mechanisms through which credit-line exposure of banks

[4]To measure banks' direct CRE exposure, we obtain "CRE loans" by summing up call report items Construction, land development, and other land loans; loans secured by multifamily residential properties; loans secured by nonfarm nonresidential properties; and loans to finance CRE. Detailed Call Report items are described in Section 3.3

[5]CRE loans to equity in December 2023 were at 240% of equity for regional banks, 340% for community banks, but only 55% for large banks.

[6]Data as of 2023Q4. Details on the construction of these variables are provided in Section 3.3.

to REITs might pose a system-wide risk? In summary, there is a higher utilization rate of credit lines by REITs relative to other NBFIs and non-financial corporates, especially when the performance of the underlying real estate assets declines and particularly during periods of aggregate economic stress (see Figure 1). This behavior is associated with a notable decrease in stock returns for banks more heavily exposed to undrawn credit lines extended to REITs, consistent with capital encumbrance imposed by credit line drawdowns impeding banks' future intermediation activities. Additionally, we quantify a significant capital shortfall at the largest U.S. banks during periods of aggregate stress. We elaborate in steps the causes and consequences of these phenomena.

We first tease out why REITs have higher utilization rates on credit lines, especially during stress. By regulation, REITs are required to pay out at least 90% of their income in the form of dividends, restricting the amount of cash REITs can accumulate.[7] This leads to a disproportionately large dependence of REITs on bank credit lines for liquidity during stress periods. In the paper, we provide examples of two large private REITs –Blackstone REIT (BREIT) and SREIT (manged by Starwood Capital) that relied on their lines of credit during 2022 and 2024 respectively, nearly exhausting their credit line capacity to satisfy investor withdrawal requests.[8] We show that the findings in these case studies generalize to a broader regression framework in which we find statistically and economically significant positive correlations between redemptions and credit line drawdowns for all REITs in our sample. We then use local projection frameworks (Jordà (2005)) around drawdown events to investigate other reasons for credit line drawdowns. We document that REITs increase investments and dividend payouts and reduce cash in the four quarters after a drawdown. This seems to indicate that they use both their cash

[7]This restriction by the Internal Revenue Service (IRS) and the Securities and Exchange Commission (SEC) enables REITs to receive special tax treatment, whereby unlike a typical corporation, REITs pay no corporate taxes on earnings paid out. REITs further have to fulfill tests that show that 95% of their gross income originates from their core business activities, limiting their ability to hedge.

[8]BREIT was faced with large redemption requests starting in 2022 forcing it to increase both the credit line commitments available from banks but also the drawdowns from those credit lines to service the redemptions. Similarly, SREIT was hit with $1.3 billion in withdrawal requests in the first quarter of 2024. To tackle these issues, SREIT relied on its line of credit. SREIT entered 2023 without having tapped its $1.55 billion credit line, but by May 2024, SREIT only had about $225 million of undrawn commitment left.

and the liquidity from credit lines to acquire properties and pay out dividends. We interact credit line drawdowns with a crisis indicator (in our case, the crisis indicator takes a value of one during the GFC and COVID-19), and find that REITs start building cash buffers during stress periods and they discontinue investing, i.e., acquiring properties. In fact, 72 cents of each dollar drawn is used to increase cash holdings. In other words, REITs use bank credit lines like "working capital" for business activities in normal times, but to hoard cash during stress times.

We next investigate the impact of higher credit line utilization by REITs on banks. Unlike term loan exposures that banks report on their balance sheet and fund with capital, and whose potential risks they manage through loan loss provisions, credit lines are off-balance sheet and funded with equity capital to a much lesser extent until drawn down.[9] Moreover, the risk of simultaneous drawdowns by borrowers during widespread market stress may suddenly constrain bank capital and/or liquidity, thereby reducing the banks' ability to intermediate effectively.

Consistent with these channels, we find that banks with higher undrawn credit line commitments to REITs experience lower stock returns during crises (controlling for banks' total credit line commitments). Moreover, we find that banks' stock return do not load significantly on banks' term loan exposures to REITs. Banks' direct CRE exposure, though, is a significant predictor of crises performance for banks. However, neither controlling for term loan nor direct CRE exposure in the regression affects the effect of banks' credit line exposure to REITs on stock returns during aggregate stress periods.

To establish greater confidence in the mechanism at work, we also develop a bank-level shock variable based on banks' granular exposures to various REIT subsectors and their performance.[10] Our findings indicate that bank stock returns co-move with the indices of the specific REIT subsectors they are exposed to, but not with those of other subsectors. Overall, REIT credit line exposure affects banks both during aggregate market stress and

[9]Banks usually fund undrawn credit lines only with little capital following the advanced approach stipulated in the Basel regulation. See Acharya, Engle, Jager, and Steffen (2024b) for a detailed discussion.

[10]We classify REITs into one of 9 sub-groups - Health Care, Industrial, Lodging/Resorts, Mortgage, Office, Residential, Retail, Diversified, or Commercial- Other to estimate sub-sector specific conditions.

in response to idiosyncratic shocks within specific REIT subsectors.

Does the pricing of credit lines extended to REITs—relative to those issued to other NBFIs or non-financial corporates— signal or incorporate an increased risk of larger drawdowns?[11] Investigating different spreads and fee measures as proposed in prior literature (Berg, Saunders, and Steffen, 2016), we do not find evidence that banks factor in larger drawdown risks of REITs when setting credit line prices.

Finally we document that credit lines to REITs substantially increase banks' capital requirements during aggregate stress periods. We update the augmented SRISK methodology from Acharya et al. (2024b) to estimate an expected (market-equity based) capital shortfall under aggregate market stress (e.g., −40% correction to MSCI Global Index) vis-a-vis a benchmark capital requirement (e.g., 8% of market equity relative to market equity plus non-equity liabilities), by incorporating REIT and non-REIT credit lines in stress test scenarios. We compare three models: one treating all borrowers uniformly, one distinguishing REITs by their unique drawdown behavior, and one considering direct on-balance sheet CRE exposure. As of Q4 2023, we estimate that the incremental capital requirement for publicly traded US banks rises by approximately 20%—from USD 180 billion to USD 217 billion—primarily due to REIT drawdowns, while CRE exposures add only USD 2 billion. Notably, over 90% of this additional capital burden falls on large banks. These results highlight the systemic risks posed to banks, and in turn to the real economy, by REIT credit lines, underscoring the need for careful regulatory scrutiny.

Our paper focuses on an important class of publicly traded NBFIs, viz. REITs, but raises broader questions about the growing linkages between banks and NBFIs. Acharya et al. (2024a) document that NBFI drawdowns have risen from 25% in 2013 to over 50% post-COVID, with private NBFIs accounting for nearly 60% of drawdowns by private firms (compared to 30% for public ones). Additionally, credit lines to NBFIs such as Business Development Companies (BDCs) and Collateralized Loan Obligations (CLOs) have increased from 28% to 42% of total bank credit to NBFIs between 2013 and 2023.

[11] Regulatory frameworks such as the Liquidity Coverage Ratio (LCR) already categorize financial borrowers as more costly, thereby implicitly increasing the costs banks incur in providing these credit commitments. However, there is no separate treatment for credit lines to REITs, to the best of our knowledge.

Given that private NBFIs generally exhibit higher credit line utilization rates than REITs, stress in their funding conditions could similarly affect banks via the credit line channel. In essence, as NBFIs continue to expand their role in credit intermediation, their continuing reliance on banks for contingent liquidity highlights a critical channel through which risks may be transmitted back to the banking system.

2 Related Literature

Our study relates to three main strands of literature. First, the importance of the credit line business for banks and their performance. Second, the link between banks and non-banks and its systemic implications. Third, the literature on (recent as well as historic) CRE stress episodes and their effect on banks.

The provision of liquidity by banks through credit lines is commonly perceived as the asset-side counterpart to their deposit-taking operations if credit line and deposit drawdowns are not highly correlated (Kashyap, Rajan, and Stein (2002)), or if depositors perceive banks to have implicit or explicit backstops (Gatev and Strahan (2006)). However, the business of credit lines can also present a substantial risk for banks due to the potential for correlated drawdowns by borrowers during periods of widespread market stress and affect financial intermediation (Acharya and Mora, 2015; Ippolito, Peydró, Polo, and Sette, 2016; Kapan and Minoiu, 2021; Chodorow-Reich, Darmouni, Luck, and Plosser, 2022; Acharya, Engle, Jager, and Steffen, 2024b). In particular, Acharya, Almeida, and Campello (2013), Berg et al. (2016), and Berg, Saunders, Steffen, and Streitz (2017) provide empirical evidence on if and how banks deal with these risks in pricing the credit lines they offer to their borrowers. We contribute to these findings by showing that NBFI credit line exposure can be particularly risky for banks. REITs, in particular, have elevated drawdown levels and cyclicality which translates into additional strain on banks' stock prices and balance sheets in periods of stress. We also document that this elevated risk of REIT credit lines does not seem to be priced by banks.

There is a growing literature documenting the impact of increased post-global financial

crisis regulation on substitution from banks to nonbanks in mortgage lending (Buchak, Matvos, Piskorski, and Seru (2018), large corporate lending (Fleckenstein, Gopal, Gutierrez, and Hillenbrand (2023)), middle market lending (Chernenko, Erel, and Prilmeier (2022)), and small business lending (Gopal and Schnabl (2022)). However, this growth in NBFI market share has come in part due to the availability of bank financing, particularly in the form of liquidity insurance. Acharya et al. (2024a) show that there are sizeable funding relationships between unaffiliated banks and NBFIs, particularly through credit lines. Jacewitz, Unal, and Wu (2021) show that bank holding companies (BHCs) extend shadow insurance to the money market funds, affecting their expense ratios. Caglio, Copeland, and Martin (2021) show that access to liquidity through bank holding companies significantly improves broker-dealer performance in the financial crisis. Chernenko, Ialenti, and Scharfstein (2025) also document that business development companies (BDCs) that provide private credit to firms are also substantially financed by banks. Cetorelli and Prazad (2024) explain the coexistence of commercial banks and NBFIs within BHCs partially through synergies related to liquidity management. Our paper documents additional linkages between banks and NBFIs (in, particular, REITs) but focuses on how these linkages can transfer shocks from the CRE sector via NBFIs back to the bank balance sheets, particularly for the largest banks in the economy.

Regarding REITs and risks originating in the CRE sector, there are two relevant substrands of literature to consider. The first links real estate exposure to bank risk. Mei and Saunders (1995) document how investment in real estate affects ex-ante risk pricing in bank stocks. Cole and White (2012) show that exposure to commercial real estate is a persistent predictor of bank failure across several crises episodes – a finding confirmed by Altunbas, Manganelli, and Marques-Ibanez (2017). We contribute by showing how indirect exposure of banks to the CRE market, through off-balance sheet credit line exposures to REITs, is an additional risk factor for banks, on top of their direct CRE exposure.

Furthermore, in light of recent developments such as work-from-home and rising interest rates, several papers have analyzed the effects on CRE. Gupta, Mittal, and Van Nieuwerburgh (2022) demonstrate how work-from-home policies have caused a mas-

sive reduction in office real estate valuations. Jiang, Matvos, Piskorski, and Seru (2023) show how the rising interest rate environment hits banks' balance sheet through their CRE exposure, resulting in severe solvency risk for a large number of smaller banks. Glancy, Kurtzman, Loewenstein, and Nichols (2023) highlight, in contrast, the importance of recourse in structuring CRE loans and the improved resilience it rewards in crisis times. Our paper adds an important dimension to this debate, which is that indirect exposure to the CRE market through REITs is a crucial element in understanding bank risk, especially for large banks that specialize in credit line provision to NBFIs (including REITs). Importantly, it is a risk that is not easily managed by banks as drawdowns and repayments are at the discretion of borrowers, not banks, and can exaggerate banks' cyclical risks.

3 Institutional Background and Data

3.1 Institutional Background

Our paper focuses on the growth of credit lines from banks to nonbank financial institutions (NBFIs), in particular REITs. NBFIs rely primarily on their bank credit lines to meet their liquidity needs arising from uncertain timing of credit origination, meeting funding or rollover risks, and posting margins on derivatives positions, among others (see Acharya et al. (2024a) for a discussion). Over the last decade, banks have significantly increased their overall commitments to NBFIs. In 2010, NBFIs constituted 25% of bank credit commitments. This share has since risen consistently, reaching roughly 33% in 2022. Among the financial institutions, REITs are the largest category by size of credit line commitments. On average, between 2010 and 2022, 22% of all commitments to NBFIs were to REITs, and REITs made up 6.75% of total credit line commitments in 2022. Commitments to REITs have increased cumulatively by about 30% over the last 10 years.

Background on REITs - REITs, or real estate investment trusts, are companies that own or finance real estate. The properties they own comprise offices, apartment buildings,

warehouses, retail centers, medical facilities, data centers, cell towers, infrastructure, and hotels. To qualify as a REIT, a company must invest at least 75% of its total assets in real estate and derive at least 95% of its gross income from rents from real property, interest on mortgages financing real property, or from sales of real estate – limiting their ability to use hedging strategies. As of 2023, REITs of all types collectively own more than $4 trillion in gross assets across the U.S., with public REITs owning approximately $2.5 trillion in assets, and U.S. listed REITs having an equity market capitalization of more than $1.3 trillion (Source: National Association of Real Estate Investment Trusts (Nareit)).

There are two main types of REITs – Equity REITs and mREITs (or mortgage REITs). The majority of REITs are publicly traded equity REITs. Income for REITs comes from either leasing out or renting space they own. mREITs provide financing for income-producing real estate by purchasing or originating mortgages and mortgage-backed securities and earning income from the interest on investments. Over 90% of REIT assets are in equity REITs. Consumers can purchase individual REIT stocks or REIT exchange traded funds (ETFs). REITs are not typically taxed at the entity level, which allows investors to avoid double taxation on dividends. In return, REITs are required by the IRS and SEC to pay out at least 90% of their income in the form of dividends.[12]

3.2 Data and Summary Statistics

To understand the impact of bank credit line commitments to REITs, we combine data from several sources. First, we collect quarterly borrower-level information for financial and non-financial borrowers from CapitalIQ as well as Compustat covering credit line commitments and usage, balance sheet as well as performance metrics. Second, we collect quarterly lender-level information from FR Y-9C filings to the FDIC ('Call Reports')

[12]The original REIT legislation, enacted in 1960, was intended to provide a tax-favored vehicle through which individuals could invest in a professionally managed portfolio of real property. Per SEC regulations, *"To qualify as a REIT, a company must have the bulk of its assets and income connected to real estate investment and must distribute at least 90 percent of its taxable income to shareholders annually in the form of dividends. A company that qualifies as a REIT is allowed to deduct from its corporate taxable income all of the dividends that it pays out to its shareholders. Because of this special tax treatment, most REITs pay out at least 100 percent of their taxable income to their shareholders and, therefore, owe no corporate tax."*. Source - https://www.sec.gov/files/reits.pdf

covering balance sheet and performance metrics at the bank holding company (BHC) level. Third, we collect data on the issuance of syndicated loans from Refinitiv Loan Connector (formerly Dealscan). We match these loans to our lender and borrower-level information. Fourth, we obtain stock prices for all borrowers and banks in our sample, as well as the S&P 500 from CRSP. Lastly, we obtain the VIX from WRDS and a REIT index from the National Association of Real Estate Investment Trusts (Nareit). Our analyses focus on public firms and a sample period from 2005Q1 to 2023Q4.

Panel A of Table 1 gives an overview of the size, capital structure, and rating quality of different borrowers. The comparison shows that NBFIs are, on average, larger than non-financial firms. A greater share of REITs have credit ratings, but REITs have higher leverage, maintain less cash or liquidity relative to assets, have longer debt maturities and are less likely to have secured loans. REITs and non-financial firms, however, have similar credit quality on average. We depict further distributional information of the key firm characteristics in Online Appendix Figure OA.6.

Panel B of Table 1 shows descriptive statistics for credit line characteristics after matching the loan-level data set with the bank and borrower-level information. On average, NBFIs including REITs have much larger credit lines than non-financial firms, but have a lower spread on their credit lines as well as a somewhat shorter maturity. Covenants, however, are more likely to occur in credit lines to NBFIs. Financial covenants, in particular, such as maximum leverage ratios and maximum debt to cashflow ratios, occur more often for REITs.

We list all the variables we construct throughout the paper for various empirical exercises together with their exact definition and source in Appendix Table A1.

3.3 Total CRE exposure

To measure a bank's *total* CRE exposure, we add up *direct* exposure through commercial mortgages, *indirect* exposure through term loan exposure to REITs, and *indirect* exposure through credit line exposure to REITs.

We obtain direct exposure from the sum of call report items from Bank Holding Company Call Reports (FR Y-9C) as sum of the following items -

- Construction, land development, and other land loans - reported as *BHDM4415* pre-2007, and as sum of *BHCKF158* (1-4 family residential construction loans) and *BHCKF159* (Other construction loans and all land development and other land loans) after 2007.
- Loans secured by multifamily (5 or more) residential properties - *BHDM1460*
- Loans secured by nonfarm nonresidential properties - reported as *BHDM1480* pre-2007, and as sum of *BHCKF160* (Loans secured by owner- occupied nonfarm nonresidential properties) and *BHCKF161* (Loans secured by other nonfarm nonresidential properties) after 2007
- Loans to finance CRE - *BHCK2746*

To get the REIT term loan exposure of a given bank we multiply the bank's sum of total C&I loans (*BHCK1763, BHCK1764, BHCKKX56*) and loans to financial institutions (*BHCKJ454, BHCK1292, BHCK1296*) from Call Reports with an estimated REIT share of term loans for the bank. We need to do this estimation as FDIC Call Reports do not separately record term loans (or credit lines) to REITs. The REIT share is estimated by dividing, within all term loans reported in Dealscan, the volume of a bank's loan exposures to REITs by the volume of a bank's total loan exposures.

We then repeat the exercise for credit lines. We take a bank's sum of off-balance sheet commitments in the C&I market (*BHCKJ457*) and to other financial institutions (*BHCKJ458*) and multiply it with an estimated REIT share of credit lines for the bank to obtain each bank's REIT credit line exposure. The REIT share is again estimated by dividing a bank's volume of REIT credit lines by a bank's volume of total credit lines as reported in Dealscan.

4 Firm drawdown behavior

We documented in Figure 3 that large US banks have sizeable exposures to REITs in the form of term loans and credit lines.

In addition, Panel A of Figure 4 shows the sum of direct and indirect CRE exposure, in absolute values, for the three bank size groups. It becomes evident that when total CRE exposure is considered, large banks have built up considerable risks over the last decade. In Panel B, we show the development of the direct and total exposure for large banks relative to equity over time. The red dotted line indicating the exposure from taking exposure to REITs into account shows a strong upward trend over the 2021–2023 period underscoring the build-up of risk through extension of credit lines to NBFIs. Therefore, to fully understand the implications of stress in the CRE market on banks and their potential systemic impact, it is crucial to consider the indirect exposure of banks via their credit line exposure to CRE REITs.

In Figure 5, we show box plots of the direct CRE exposure as well as of the share of credit lines to REITs in total credit lines by bank size groups. From the box plots for direct CRE exposure it is evident that even the large banks with the highest exposure (relative to book equity) operate below the 25th quantile of regional or community banks. The distribution of CRE exposure is therefore heavily skewed by size. The box plots for the share of REIT credit lines in all credit lines show a similarly stark skewness. While the upper quartile of large banks have REIT credit lines shares ranging from 7.5% to 20%, the respective share for regional banks is 0 up until the 75th quantile. Community banks have no REIT CL exposure whatsoever as Figure 3 already alluded to.

In this section, we focus on credit lines and discuss to what extent these exposures can be expected to put a strain on bank balance sheets. For this purpose, we analyze the drawdown behavior of REITs, both on average and under stress, relative to other borrowers. Throughout the paper, we use credit line utilization to refer to the level of credit line drawdown as a share of credit lime commitment.

4.1 Average utilization levels

We first compare the drawdown behavior over time in graphical form. Figure 6 (Online Appendix Figure OA.7 - Panel B) depicts the average (median) utilization rates from 2010Q1 to 2023Q4 by borrower type. There is a large and persistent gap over time with REITs utilizing between 5 and 15 percentage points (ppt) more than non-financial companies, with the gap largest during the COVID-19 outbreak in 2020Q1. Moreover, the utilization rate of REITs appears more volatile than that other borrowers, suggesting that the utilization of credit lines by REITs is very sensitive to market conditions.

These average differences are stark but mask significant heterogeneity across credit ratings. In Panel A of Table 2 we show the average utilization rates for three groups of borrowers – non-financial corporations, REITs, non-REIT financial corporations – as well as split by four different rating categories within the group: all A-rated, BBB-rated, non-investment grade, and unrated borrowers. It is apparent that for all rating categories, financial corporations draw down significantly more than non-financial borrowers.

In Panel B of Table 2, we further split credit line utilization behavior across crisis and normal times. As expected, all firms utilized credit lines more during the GFC (2007Q3-2009Q2) and the COVID-19 (2020Q1) crisis relative to their normal credit line utilization rate. However, the differential is significantly higher for REITs. Taking COVID-19 as an example, we see that A-rated REITS increased their utilization by 17 ppt relative to their normal utilization rate compared to an 2 (8) ppt increase for non-financial firms (NBFIs excluding REITs). BBB-rated and non-IG REITs increased utilization by 23 ppt and 32 ppt respectively compared to an increase of 10 (9) ppt and 21 (10) ppt for non-financial firms (NBFIs excluding REITs) during the same period. Overall, it appears that REITs have high average utilization rates, and this utilization increases to a much larger extent during crises or stress episodes.

To rule out that these differences in utilization rates are driven by differences in firm characteristics, we move to a regression analysis of utilization rates. We run the following

regression:

$$Utilization_{it} = \beta REIT_i + \alpha_t + \alpha_c + \zeta X_{it} + \epsilon_{it}, \quad (1)$$

where α_t is a time fixed effect, α_c is a rating fixed effect either at the rating-notch or rating-group level (all As, BBB, non-IG, unrated), X_{it} is a vector of firm controls – log of total assets, firm leverage (debt to equity), liquid assets over total assets, short-term debt ratio (measured as short term over total debt), return on assets and new debt issuance to assets as well as an indicator for whether the remaining volume-weighted maturity on outstanding credit lines is less than 1 year. *REIT* is an indicator variable that takes a value of one for REITs and zero for all other financial and non-financial firms. The standard errors are clustered at the firm level.

The results are shown in Panel A of Table 3. Column (1) runs a simplified version of specification 1 without fixed effects and controls, as the analytical counterpart to Figure OA.7. REITs, on average have a utilization rate that is 5.5 percentage points higher than non-financial companies. When controlling for rating-notch fixed effects and firm controls this difference shrinks to 5.2 percentage points in Column (2), a point estimate that is not affected by adding time effects in Column (3) or replacing the rating-notch fixed effects by rating-group fixed effects in Column (4).[13] Restricting the sample to the years 2010–2019 to remove the GFC and the Covid-19 episode in Column (5), leaves the point estimate at 5.2 percentage points.

In Panel B, we include NBFIs excluding REITs as a separate borrower category and find that both REITs and other NBFIs have higher drawdown levels than non-financial companies, on average.

We also study whether the differences in capital structure of REITs relative to other borrowers are driving their credit line utilization patterns. In Online Appendix Table OA.3, in addition to the controls described above, we interact an indicator for REIT with

[13]We want to stress that while credit ratings are an important predictor of drawdown behaviour as demonstrated, e.g., in Table 2, we could not detect a differential gradient in utilization rates to credit ratings between REITs and non-REITs.

these variables to see if REITs respond differently to capital structure changes. We do not find meaningful significant differences.

4.2 Cyclicality of utilization

In addition to the permanently elevated levels, Figure 6 and Table 2 also hint at a greater cyclicality or stress-sensitivity of the credit-line utilization of REITs. To formally test the relationship between credit line utilization and market conditions, we estimate the following regressions:

$$\begin{aligned} Utilization_{it} =& \beta \text{REIT}_i + \gamma \text{REIT}_i \times \text{Market Conditions}_{it} + \delta \text{Market Conditions}_{it} \\ &+ \alpha_t + \alpha_c + \zeta X_{it} + \epsilon_{it}, \end{aligned} \tag{2}$$

for firm i in quarter t where REIT takes a value of one for REITs and zero otherwise. *Market Conditions* are measured by aggregate stock market returns (S&P 500), market volatility (VIX), or stock market performance of comparable firms (Sub-sector return). Additionally, we include measures for aggregate credit supply using the Excess Bond Premium (Gilchrist and Zakrajšek (2012)), Excess Loan Premium (Saunders, Spina, Steffen, and Streitz (Forthcoming)), and the average spread on commercial paper as further proxies for *Market Conditions* in Equation 2. We add the logarithm of total assets, the level of liquid assets to total assets, firm leverage (debt to equity), short term debt over total debt ratio, return on assets and debt issuance over total assets as control variables. α_t is a time fixed effect, α_c is a rating fixed effect either at the rating-group level (all As, BBB, non-IG, unrated).

The sub-sector return is constructed as a market capitalization-weighted average of public firms in our sample belonging to the same 2-digit SIC for non-REITs; for REITs, we construct the market capitalization-weighted index using a REIT subsector classification. REITs are classified into one of 9 sub-groups: Health Care, Industrial, Lodging/Resorts, Mortgage, Office, Residential, Retail, Diversified, or Commercial-Other. In calculating the sub-sector return, we perform a "leave-one-out" estimate, excluding the firm from its own

sub-sector return calculation to prevent any mechanical correlation. We split REITs into multiple sub-categories as there is a significant amount of heterogeneity in stock market performance within REITs. Specifically, some REITs have seen large growth and market appreciation in recent years (for example, industrial REITs), while others have struggled (a prime example being office REITs post-COVID). Figure 7 plots the performance of all the REIT subsectors during the COVID-19 episode. Here, the under-performance of office REITs (e.g., a drop of 43% from 2021Q4 to 2023Q4) stands out relative to the out-performance of Residential mREITs (e.g., an increase of 124% from 2021Q4 to 2023Q4). Online Appendix Figure OA.8 zooms out to study the average stock market performance of the different REIT subgroups over a longer time period from 2005Q1 to 2023Q4.

The results of estimating the specification in Equation 2 are shown in Table 4. Column (1) shows that the sensitivity of REITs to market conditions is much stronger than the sensitivity of non-REITs. A one standard deviation decrease in S&P 500 leads to a 2.19 ppt additional increase in credit line utilization for REITs. In Column (2), we test whether the effect is symmetric across positive and negative market news. Interestingly, we see that REITs only respond to negative market news by increasing their utilization.

Column (3) shows that a one standard deviation increase in VIX leads to an additional 1.91 ppt increase in the utilization of REITs. In Column (4), we see that in crisis times (2007 Q3 to 2009 Q2 for GFC and 2020 Q1 for COVID-19), REITs increase utilization, on average, 5 ppt more than other borrowers. In Column (5), we see that REITs are also more sensitive to subsector-specific stress than other companies with an additional 2.98 ppt increase in the utilization rate for each standard deviation increase in the sub-sector return.

Furthermore, to compare whether utilization is driven by firm earnings (indicated by worse sub-sector returns[14]) or by financial frictions, in Column (6), (7) and(8), we study how credit supply affects borrower utilization. We measure aggregate credit supply conditions using either the Excess Bond Premium (EBP. see Gilchrist and Zakrajšek (2012)),

[14]Since we control for return on assets in our specifications, we interpret the association between heightened utilization levels and low sector returns as a forward-looking association and not as a reaction to bad earnings in the past which would be subsumed by the coefficient on return on assets.

the Excess Loan Premium (ELP, see Saunders et al. (Forthcoming)), or spreads on financial commercial paper. We see that, in fact, aggregate credit supply does not affect REITs' utilization differently from the utilization of other borrowers. This suggests that earnings-based constraints have a larger impact on REIT utilization rates. Importantly, Appendix Table A2 shows that these patterns are similar if we separate non-financial borrowers from NBFIs excluding REITs implying that the heightened stress sensitivity of REITs is a unique feature that does not generally extend to other NBFIs. Moreover, Online Appendix Table OA.4 shows that these results are robust to adding interaction terms between our control variables and the respective indicators of market stress.

5 Economics of REIT Drawdowns

We finalize our analysis of REITs with two ancillary inquiries that enrich our understanding of what drives REIT usage of bank credit lines.

5.1 Reasons for Drawdowns - Redemptions

What reaction should we expect from REIT investors, if they observe a further deterioration of REITs' performance? And how will this affect banks that lend to REITs? We shed light on this question using the recent redemption run on Blackstone REIT (BREIT) in 2022 and Starwood REIT in May 2024 as brief case studies.

BREIT, founded in 2017, is one of the largest REITs holding assets in excess of 100 billion USD. Starting in 2022, spurred by rising interest rates and investors' waning trust in a continued strong performance of real estate investments, BREIT was hit with large redemption requests, especially from Asian investors. As BREIT is not publicly traded, it reserved the right to limit redemptions at 2% of the net asset value (NAV) per month.[15] Starting November 2022, BREIT was making use of this right and curbed redemptions for the following sixteen months. To generate sufficient liquidity for these redemptions,

[15]See, for example, https://www.wsj.com/articles/blackstone-limits-redemptions-from-real-estate-vehicle-stock-sinks-11669920880

BREIT was forward-looking and negotiated an increase in the volume of committed credit from roughly 7.5 billion USD in 2022Q2 to 12 billion USD in 2022Q4 with Citigroup being the main financier and Bank of America, Deutsche Bank and Wells Fargo being involved in the syndicate. Interestingly, the credit spread that was charged for these additional commitments did not differ from previously arranged credit lines to BREIT by the same banks despite the obviously increased credit and drawdown risks.[16] We will get back to this pricing evidence in a more systematic fashion in Section 6.2. On top of acquiring higher commitments, BREIT increased the volume of credit that they drew down from those commitments from 1.1 billion USD in 2022Q1, over 3.8 in 2022Q2 and 5 billion USD in 2022Q3, to 6.3 billion USD in 2022Q4.[17]

Similarly, SREIT, a nontraded trust managed by Starwood Capital with $25 billion in assets was hit with $1.3 billion in withdrawal requests in the first quarter of 2024. SREIT limited redemptions to 0.33% of net assets a month, down from the 2% it had allowed since inception, satisfying less than $500 million of their redemption requests in early 2024.[18] At the same time, SREIT's new fundraising had dwindled to about $15 million a month, down from more than $600 million a month in the first half of 2022. Overall, their liquidity continued dropping, from $2.2 billion at the end of 2022 to $1.1 billion at the end of 2023 and $752 million as of April 2024. To tackle these issues, SREIT relied on its line of credit. In May 2022, SREIT increased the borrowing capacity on a $450 million credit line to $1.55 billion by adding new banks to the contract, at SOFR + 2.5%. SREIT entered 2023 without having tapped its $1.55 billion credit line, but by May 2024, SREIT only had about $225 million of undrawn commitment left to utilize.[19]

[16]Source - 10Q filings of BREIT (https://www.breit.com/stockholders/). BREIT has three forms of credit lines - unsecured credit lines increased from $3.7 billion to $5.6 billion between June and December 2022 with spreads remaining 250 bps over SOFR. Furthermore, their secured credit lines and warehouse lines of credit increased from $3.75 billion to $6.3 billion in the same period, with spreads only changing by 2bps from 175 bps to 177 bps over LIBOR.

[17]To further secure the necessary cash, Blackstone negotiated a strategic partnership with the University of California. The university's investment fund provided 4 billion USD in cash for which BREIT promises an 11.25% return – a promise that is backstopped by 1 billion USD of BREIT shares.

[18]Source - Wall Street Journal, https://www.wsj.com/real-estate/commercial/starwood-capital-group-real-estate-fund-cash-crunch-409f56d5

[19]Soruce - SREIT 10Q Filings - https://www.starwoodnav.reit/sec-filings/filings-type/all/date/All/sort/DESC/page/1/

This shows how redemptions of fund shares can impact the drawdown behaviour of REITs on bank credit lines. In fact, since public REITs do not have access to using the redemption limit, one would expect the implications for drawdowns to be even stronger. To test this hypothesis in our data, we estimate the following regression:

$$\Delta Drawn\ CL\ Volume_{i,t} = \beta Shares\ Redeemed_{i,t} + \alpha_i + \alpha_t + \epsilon_{i,t}, \tag{3}$$

where $\Delta Drawn\ CL\ Volume_{i,t}$ is the quarterly log growth in the utilized credit line volume for a REIT i in quarter t, $Shares\ Redeemed_{i,t}$ is the negative of quarterly log change in number of common shares in a REIT where a negative number indicates further issuance while a positive number indicates redemptions or stock repurchases by the issuer, and $\alpha_{i/t}$ are the REIT and time fixed effect, respectively. There could be concerns of reverse causality in such an estimation if drawing down on a credit line was a good or bad signal to the market about the future performance of the REIT. However, given the permanent use of credit lines by REITs both in good and bad times — see results in Sections 4 and 5.2 — such a signaling effect is highly unlikely.

The results can be found in Table 5. Between Columns (1) and (5), the specifications become stricter by adding fixed effects, control variables and crisis interaction terms. We see that the main coefficient of interest is largely unaffected by these changes and remains statistically significant. Moreover, the value is economically meaningful. For a one percent increase in redemptions, the REITs increase their drawdowns by 0.44 percent. In case of BREIT, as an example, the redemption requests grew by more than 100% in the fall of 2022 thus leading to a 44% increase in drawdowns according to our estimates. Given the baseline utilization level of REITs being already around 25-30%, this would equal a further 11-14 ppts of utilization. Columns (4) and (5) also shows that redemptions seem to be the main driver of credit line drawdowns by REITs, with other factors playing a limited role in their drawdown behavior.

Furthermore, we show that the credit line utilization increases with the erosion in equity value. That is, even if shares cannot or do not get redeemed, shareholder pressure

affects REIT drawdowns. We measure equity erosion using both book and market value of equity in Appendix Table A3. We see that when either book or market value declines, the REIT is more likely to drawdown on its credit line. Unlike shares redeemed, however, these measures reflect changes coming from either the number of shares or prices, which could in turn be a measure of REIT performance. We therefore, separately in Column (4) test whether changes in stock prices drives credit line utilization and do not find that to be the case. Lastly, Column (5) shows that a horse race between book and market equity suggests that changes in credit line utilization are driven by changes to book rather than market value of the REIT.

Finally, while redemptions are a common concern for many types of funds, REIT drawdown behavior appears special. For example, open-end mutual funds and exchange-traded funds offer daily redemptions to investors. While nearly 50% of open-end funds have access to credit lines, on average only 20% of funds have a positive credit line utilization (Cai, Chuan, Henry, Shin, and Tuzun (2023)). At the start of COVID-19, many funds experienced heavy investor redemptions. Funds, in turn, increased their credit line utilization. However, the percentage of used credit lines increased from only 11% to 17%, significantly lower than the average non-crisis time utilization levels of REITs (Cai and Shin (2021)). The higher utilization of REITs is potentially linked to lower levels of liquidity on hand. Recall that due to the dividend payout restriction mentioned in Section 3.1 forcing REITs to pay out 90% of their income, they have almost no retained earnings to build up cash buffers. That is, credit lines more so than for other large publicly traded firms serve as a primary source of short-term liquidity for REITs.

5.2 How do REITs use Credit Lines?

For which purposes do REITs need cash? Hardin and Hill (2011) established in data up to 2009 that REITs do not use credit lines to pay out dividends. Instead, acquiring new properties which requires large sums of cash as well as hedging against worsening market conditions seemed to be the main motives. We investigate which of these motives

dominate by analyzing in a local projection framework, along the lines of Jordà (2005), the development of investments (i.e., properties), dividend payouts, or cash and cash equivalents (i.e., precautionary savings) around elevated drawdown activity of REITs. We further explore whether the drawdowns are independent of the market conditions that the REIT is facing. In other words, are REITs drawing on their credit lines for the same reasons in normal times and crisis times?

We estimate the following local projection framework with an interaction between drawdowns and a crisis dummy which captures the GFC and the Covid-19 episode, with the results reported in Table 6:

$$Y_{i,t+h} - Y_{i,t-1} = \alpha \text{Drawdown}_{i,t} + \beta \text{Drawdown}_{i,t} \times \text{Crisis}_t + \gamma Y_{i,t-1} + \alpha_t + \alpha_i + \epsilon_{i,t}, \quad (4)$$

where Y is either investments, cash and cash equivalents, or total dividend payout (all in dollar values); $\text{Drawdown}_{i,t}$ is the change in the drawn dollar amount of firm i at time t; $Crisis_t$ takes a value of one during GFC and COVID-19; α_t is a time fixed effect; and, α_i is a firm fixed effect. h ranges from 0 to 4 to capture contemporaneous as well as forward-looking effects that may reflect the intended usage better.

Panel A of Table 6 shows that as soon as REITs draw down, their investments increase. Out of one dollar being drawn, roughly 34 cents are being invested. Panel B shows that cash, however, falls by 7 cent per dollar of drawdown albeit this effect is not statistically significant. That is, REITs use the liquidity from the credit line together with the cash they previously built up, to acquire new properties. Panel C shows the results for the dividend payout and indicates that, on average, drawdowns are also linked to higher dividend payouts, even though the number of 0.6 cents per dollar of drawdown is economically small.

Furthermore, in Panel A we see that the crisis interaction, even though not statistically significant, is of similar size as the standalone coefficient implying that REITs stop acquiring properties in crisis times. This indicates that REITs' drawdown behaviour cannot be linked to price stabilizing behaviour on the (commercial) real estate market. Second, and

more importantly, in Panel B, we see that in crisis times, REITs hoard cash as the interaction coefficients are of opposite sign and significantly larger in size than the standalone coefficients. Contemporaneously, out of 1 dollar of drawdown, 72 cents are used as cash. Therefore, while REITs acquire properties with drawdowns in regular market times, their precautionary savings motive only materializes in crisis times. In Panel C, we see that the interaction coefficients for dividends and short-term debt are occasionally statistically significant but of opposite signs depending on the horizon, suggesting that REITs' dividend payout is not changing in a systematic way during crises. In light of the recent stress (especially 2022 onwards) on CRE markets it therefore seems that REITs likely have high incentives to draw down to build a buffer against potential cash flow shocks or a further rising of interest rates which could worsen rollover conditions for their debt.

One worry is that, given the sample period, the crisis results may be driven by the special nature of the COVID-19 crisis. As robustness, in the appendix, we test whether the lack of investment and increased cash accumulation are a symptom of large crises or more broadly reflect deteriorating market conditions. In Online Appendix Table OA.5, we interact credit line drawdowns with aggregate S&P 500 market returns. While economically smaller in magnitude, the qualitative results are similar - when market conditions deteriorate, REITs reduce investment and increase cash holdings.

Lastly, we test whether the increased use of credit lines in crisis to accumulate cash may be driven by lack of credit availability in the market during worsening economic conditions, leading to increased precautionary savings. In Online Appendix Table OA.6, we interact credit line drawdown with the Excess Bond Premium (Gilchrist and Zakrajšek (2012)) which captures aggregate credit supply. While tightening credit supply (increase in EBP) leads to a slightly higher rate of cash accumulation, it does not decrease REIT investments.

Taken together, these results suggest that worsening economic conditions, particularly in crises, alter REIT behavior - by reducing their investments and increasing their cash holdings. This effect also seems to be driven by demand rather than credit supply.

6 Impact on Banks

We now turn to addressing how the elevated drawdown behavior of REITs affects the banks that lend to them. In particular, as credit lines can be drawn intensively by CRE REITs in times of aggregate stress in order to manage their liquidity risk, collateral damage to the largest banks from such drawdowns implies that systemic risk arising from CRE exposures is likely to be considerably greater than that implied by direct CRE exposure of banks.[20] While banks record term loan exposures on their balance sheet, fund them with capital, and manage potential risks through loan loss provisions, credit lines, on the other hand, are off-balance sheet, and funded with equity capital to a much lesser extent until drawn down. Furthermore, the potential for correlated drawdowns by borrowers during periods of widespread market stress can create sudden encumbrance of bank capital and/or liquidity leading to a diminished capacity for intermediation (as noted respectively in Acharya et al. (2024b) and Acharya and Mora (2015)), increased reliance on deposits (see, for example, Ippolito et al. (2016)), a contraction in the supply of credit and a decline in bank stock returns (Kapan and Minoiu (2021), Acharya et al. (2024b), Chodorow-Reich et al. (2022), and Greenwald, Krainer, and Paul (2023)). To test the impact on banks, we first look at the impact of REIT drawdowns on bank stock returns.

6.1 Impact on Bank Stock Returns

It is not obvious that higher REIT drawdowns should lead to worse returns for banks. If banks are diversified in their credit line exposure, such that in periods when REITs draw down more, either their other borrowers reduce their drawdowns or if banks benefit from flight to quality of deposits, then such imperfect or negative correlation of drawdown incidence can help banks hedge their liquidity risk. We directly test this in the data.

[20] While total credit line commitments of banks have broadly grown along with their balance-sheet lending, credit lines to REITs have grown at a much faster rate than credit lines to other borrowers.According to our calculations based on the LoanConnector dataset, the growth rate of non-REIT credit lines between 2012 and 2023 was 28.5%, while the growth rate over the same period for REIT credit lines was around 86%.

For this purpose, we run the following regression

$$\begin{aligned} BankStockReturn_{it} = &\beta_1 \text{REIT CL Exposure}_i + \beta_2 Crisis_t + \\ &\beta_3 \text{REIT CL Exposure}_i \times Crisis_t + \\ &X_{it} + \mu_i + \mu_t + \epsilon_{it}, \end{aligned} \tag{5}$$

for bank i at time t where *REIT CL Exposure* measures the amount of credit lines committed to REITs, as used in Figure 3 and described in Section 3, scaled by total assets. $Crisis_t$ is one for the GFC and COVID-19 periods. X_{it} summarizes bank-level controls: 3-factor Fama-French, logarithm of total assets, capital-to-assets ratio, loans-to-assets ratio, income diversity, non-interest income, dummy for being a current primary dealer, derivatives-to-assets ratio, deposits-to-loans ratio, deposits-to-assets ratio, consumer loans-to-assets ratio, return on assets, and logarithm of the Z-score.[21] μ_i and μ_t are bank and time fixed effects, respectively.

Table 7 presents the results. Column (1) first estimates specification 5 with total credit line commitments of banks scaled by total assets as the main explanatory variable. There is a statistically significant association negative with bank stock returns in crises periods as documented in Acharya et al. (2024b). Column (2) then zooms into the credit line exposures to REITs, and highlights a highly statistically significant negative effect in crises periods. The effect is economically sizeable with one standard deviation of additional REIT CL exposure reducing bank stock returns by 1.42 percentage points. In stricter specifications (Columns 3 to 6), the effect stays quantitatively and qualitatively almost unaffected. In Column (3), we control for banks' non-REIT credit line commitments and their interaction with the crisis indicator. In Column (4), we control for banks' exposure to REITs through the term loan market. It could be that exposure to REITs harms banks' stock return in crisis periods regardless of the channel of exposure being via term loans or via credit lines. This seems not to be the case, as the term loan exposure to REITs

[21] For the calculation of the bank-level Z-Score, see https://databank.worldbank.org/metadataglossary/global-financial-development/series/GFDD.SI.01

is no significant predictor of bank stock returns. In Column (5), we control for banks' on-balance sheet CRE exposure. It could be that high credit line exposure to REITs indicates that banks have a CRE-oriented business model via its direct CRE term loan exposure. While high CRE exposure pulls down the stock return significantly in times of crises (by 2.1 percentage points for each standard deviation increase of CRE exposure), again consistent with the result of Cole and White (2012) that CRE exposures help predict bank distress, the main coefficient of interest remains virtually unaffected. All of these results can be generalized to more continuous measures of market stress, such as the S&P 500 return (see Appendix Table A4 which serves as an input for the SRISK exercise in Section 7) as well as different sets of control variables (see Online Appendix Table OA.7).

To tighten our identification of shocks beyond general market stress measures, we create a bank-level shock measures based on the exposures of each bank to various REIT subsectors and the respective subsector performance:

$$REIT\ Subsector\ Shock_{i,t} = \sum_{k} Exposure\ Share\ to\ Subsector_{k,t} \times Growth\ Rate\ Subsector\ Index_{k,t,t-4}, \tag{6}$$

where i is a bank, k are REIT subsectors (Health Care, Industrial, Lodging/Resorts, Mortgage, Office, Residential, Retail, Diversified, or Commercial- Other), t is a quarter and $Growth\ Rate\ Subsector\ Index_{k,t,t-4}$ is the growth rate of the REIT subsector index for subsector k from one year (four quarters) ago to the current quarter. This bank-level shock measure captures the details of banks' exposures as not every category of CRE is performing equally badly in periods of general market stress. For example, Health Care has performed substantially better during the Covid pandemic than Lodging/Resorts.

Table 8 presents the results of estimating the bank stock return regression using the bank-level shock measure. All the interaction terms of the shock-measure and the REIT CL exposure variable are positive and significant indicating that banks' stock returns co-move with the respective REIT subsectors that they are more exposed to. Importantly,

neither general credit line commitments nor non-REIT CL exposure are associated with differential stock returns when the REIT subsector indices move. Exposure to the CRE market through direct mortgage lending is weakly associated with the shock highlighting the CRE-specific nature of REIT portfolios. Thus, the shock variable we created is tightly identifying the relevant developments in the performance of banks' REIT exposures instead of general market movements such as the crisis dummy or S&P 500 return.

Overall, our results suggest that banks with higher exposure to REITs through their credit lines face higher drawdowns, particularly in crises. This, in turn, leads to worse bank stock performance which goes beyond the general aggregate drawdown risk on credit lines during that period. However, this risk does not seem to provide higher returns outside of crises as banks with more REIT exposure through credit lines do not, on average, have better stock performance.

To zoom in more closely on the crisis periods, we compare the stock market performance of banks with above or below-median exposure to REITs through credit lines during the GFC and COVID-19 episodes separately, allowing coefficients in specification 5 to vary each quarter. Figure 8, which plots the coefficients on the interactions, shows that banks with an above-median exposure to REITs have worse stock performance in crisis episodes, though they also recover faster, perhaps as they were bigger beneficiaries of public and Fed backstop measures (especially in 2020Q1). In terms of economic magnitude, banks with a high REIT credit line share experienced a 7.5 ppt lower return in the first quarter of 2020 (COVID-19), and a 10-20 ppt lower return (cumulatively) during the Global Financial Crisis (GFC).

6.2 Impact on Credit Line Pricing

Our results above suggest a higher drawdown risk from originating credit lines to REITs, and, hence, we would expect banks to price this into credit line fees. Thus, we now look at the pricing terms of credit lines issued to REITs. We analyze all relevant dimensions of pricing in credit line contracts: (i) the all-in-spread drawn ($AISD$) which is the spread

borrowers pay on the drawn portion of the credit line above a reference interest rate; (ii) the all-in-spread undrawn ($AISU$) which is the sum of the fees borrowers have to pay on the undrawn portion of the credit line; (iii) the commitment fee which is the fee borrowers pay to keep the line available to them; (iv) the total cost of borrowing (TCB) following Berg et al. (2016).[22] In all the regression models described hereafter, we control for various loan characteristics and borrower characteristics as detailed in the table captions. To construct the estimation sample, we constrain the raw data to only include lead arranger banks (Ivashina (2009)).

Table 9 presents the results where Panel A shows the results of model specifications without interaction terms and Panel B shows the results of model specification with interaction terms between the REIT and NBFI excluding REITs indicator variables and various contract or time-varying borrower characteristics. Focusing on Panel A, Column (1) shows that REITs pay a 8.5 bps higher $AISD$ than non-financial firms on their credit lines albeit this coefficient is not statistically significant. Similarly, in Columns (2) and (3), the results show that REITs pay slightly higher $AISU$ and commitment fee. While the coefficients for $AISU$ is statistically significant, it is economically small at $\frac{1}{7}$ of the unconditional standard deviation. The TCB in Column (4) is estimated to be slightly lower for REITs, but without statistical significance. To check whether the (potential) pricing differential carries over to term loans, or whether there is some cross-pricing effect, Column (5) analyzes the difference in interest rate spreads charged on term loans. Interestingly, REITs seem to pay 24bps less than non-financial borrowers.

[22]The precise formula for the total cost of borrowing reads

$$TCB = \frac{UpF}{Maturityinyears} + (1 - PDD) \cdot (AISU + CoF) + PDD \cdot (AISD + CoF) + \\ + PDDo30 \cdot UtF + 0.005 \cdot CaF,$$

where UpF is the upfront fee, PDD is the expected utilization rate, CoF is the commitment fee, $PDDo30$ is the probability of having an utilization rate of above 30% which is when the utilization fee applies in most contracts, UtF is the utilization fee, and CaF is the cancellation fee. For PDD, we take the previous 8-quarter rolling window average of the realized utilization rate and for $PDDo30$ we run a linear probability prediction model akin to Berg et al. (2016) but adding, for example, indicator variables for borrowers being REITs or other financials. Lastly, following Berg et al. (2016), we predict UpF when it is not available using other borrower and contract characteristics.

In Panel B we investigate whether (the absence of) the pricing difference arises because certain characteristics of the contract, such as the maturity, the volume, the reference rate, the collateralization or the existence of covenants, or characteristics of the borrower, such as default risk or stock market beta, are differentially priced for REITs biasing the point estimate for the REIT dummy in Panel A. While there is no pattern of the interaction coefficients across the columns that indicates that banks consistently apply different pricing mechanisms for REITs, some of the point estimates change meaningfully compared to Panel A. The commitment fee and the TCB are estimated to be 5.4 and 11 bps higher, respectively. Neither of these coefficients are statistically significant, however. In the biggest difference to Panel A, the $AISD$ in Column (1) is estimated to be 44 bps lower for REITs than non-financial borrowers. This estimates is economically large, but statistically insignificant. In Column (5) we find evidence for cheaper term loans being issued to REITs, but the 81bps point estimate is not statistically significant.

In summary, we find only weak evidence for pricing differences between REITs and other borrowers. REITs seem to be obtaining a slightly distinct composition of pricing elements for their credit lines. However, this does not result in a differential total cost of borrowing. REITs appear to pay slightly less on their term loans, though. To obtain more conclusive evidence, a more detailed analysis of the non-pricing components, e.g. the exact collateral posted or the breaching of covenants (Krockenberger, Saunders, Steffen, and Verhoff (2024)), would be necessary. This, however, goes beyond the scope of this paper.[23]

A possible explanation for REITs not paying a substantial premium, despite their high utilization behaviour, is one stemming from regulatory forces. Table A5 in the Appendix summarizes the treatment of different exposure types – term loans vs. credit lines – to REITs vs. other borrower classes in the credit risk and liquidity risk regulation for banks. While REITs are more expensive in liquidity risk regulation (see also the discussion in Yankov (2020) about credit lines to NBFIs) they are cheaper than other borrower types

[23]It is also possible that some banks do not even enter credit line relationships with REITs, exactly because of their drawdown behaviour. Such credit lines, in principle, carry an infinite interest rate and do not show up in our data set.

for credit risk regulation. That is, because banks that use internal models to calculate risk weights for each borrower, utilize historical default data as inputs to their models.[24] These data indicate, over the last 40 years, a much lower average default rate for REITs and other NBFI borrowers (roughly 1%) than non-financial borrowers (roughly 2%). It is therefore likely that credit lines to REITs are associated with a lower regulatory capital charge, at least, partially explaining the absence of a strong premium.

7 Systemic implications – SRISK

Thus far we have established that banks' credit line exposures to REITs are large, that REITs' differential drawdown behavior poses a greater risk to banks than other credit line borrowers, and that this elevated risk of REIT credit line exposure affects banks' stock returns in crises. In this section, we ask quantitatively how systemic the nature of REIT exposures is for the largest publicly traded US banks individually and for the US banking sector as a whole in terms of their capital shortfall under market-wide stress.

Building on the work of Acharya, Engle, and Richardson (2012), Brownlees and Engle (2017) and Acharya et al. (2024b), we calculate the expected capital shortfall in a systemic crisis ($SRISK$) for banks. We first compute the $SRISK$ values using their methodology:

$$\begin{aligned} SRISK_{i,t} &= E[K(Debt + Equity) - Equity | Crisis] \\ &= KDebt_{i,t} - (1-K)(1 - LRMES_{i,t})Equity_{i,t} \end{aligned} \tag{7}$$

where $Debt_{i,t}$ is the nominal on-balance-sheet debt of bank i's liabilities, assumed to be constant between time t and Crisis time; $Equity_{i,t}$ is bank i's market value of equity at time t; $LRMES_{i,t}$ is the Long Run Marginal Expected Shortfall if bank i at time t, approximated in Acharya et al. (2012) as $1 - e^{-18 \cdot MES}$, where MES is the one-day loss expected in bank i's return if market return is below -2%; $Crisis$ is taken to be a scenario where the S&P 500 falls by 40% over the next six months; and K is an assumed required

[24] See Behn, Haselmann, and Vig (2022) and Plosser and Santos (2018), who also show how banks that use internal models downward bias the risk they report to supervisors.

market-value of equity to quasi-market-assets capital ratio of 8%, where quasi-market-assets is the sum of book debt and market value of equity. Effectively, the market value of equity in a crisis is estimated as $(1 - LRMES_{i,t})Equity_{i,t}$ which is today's market value adjusted for stress-time loss.

To account for off-balance-sheet liabilities, and in particular the differential impact of credit line commitments to non-REIT borrowers and REIT borrowers, the necessary adjustments to *SRISK* can be broken down into two components. First, off-balance-sheet (contingent) liabilities such as bank credit lines enter banks' balance sheets as loans once they are drawn and need to be funded with capital. Second, we also have to account for the effects of unexpected drawdown risk on stock returns conditional on stress as demonstrated in our results in Section 6.1. For the first component, we add to *SRISK* in increment:

$$IncrementalSRISK_{i,t}^{CL} = K \times E[Utilization^{REIT}|Crisis] \times UnusedCommitments_{i,t}^{REIT} + K \times E[Utilization^{Non-REIT}|Crisis] \times UnusedCommitments_{i,t}^{Non-REIT} \quad (8)$$

This is the additional capital needed due to drawdown in crises periods. As documented in Section 4, these utilization rates differ significantly between REITs ($REIT$) and non-REIT companies ($Non-REIT$). Moreover, the respective utilization rates have to be multiplied by the commitments that bank i has to REIT or non-REIT borrowers. We estimate the REIT commitments by multiplying the overall outstanding commitments of bank i from the call report data with the share of REIT commitments in bank i's commitments reported in the Loan Connector database and analogously for non-REIT commitments. We use the estimate of the drawdown function obtained in Section 4.2 and impute a utilization rate for a return of the S&P 500 index of -40% to indicate a crisis period.

For the second component, we add to SRISK:

$$IncrementalSRISK_{i,t}^{LRMES^C} = (1-K) \times Equity_{i,t} \times \tag{9}$$

$$-0.4 \times [\gamma^{REIT} \times REIT\ Commitments_{i,t} + \gamma^{Non-REIT} \times Non-REIT\ Commitments_{i,t}] \tag{10}$$

This is the additional equity market value loss due to high drawdowns in stress periods, again defined as a 40% decline in the S&P 500 index. γ^k is the estimated episodic effect of unused commitments to borrower type k on bank stock returns as in Section 6.1, i.e., the effect that is not built into MES that is estimated based on "small" (-2%) market shocks, for $k = REIT, Non-REIT$.

We estimate two versions of each of the incremental SRISK components: First, leveraging the heterogeneity in borrower composition (REITs vs. non-REITs) and, second, a simplified version, reminiscent of Acharya et al. (2024b), only taking into account overall credit line commitments as a single category ignoring borrower types. The difference highlights the effect of more intensive credit line utilization by REITs. As a third exercise, we estimate the $IncrementalSRISK_{i,t}^{LRMES^C}$ stemming from CRE exposures by applying the analogous crisis episodic effect estimated in columns (5) of the tables presented in Section 6.1.

The results are summarized in Table 10 for data inputs as of 2023Q4. In Panel A we report the estimated parameters that are inputs for the formulae 8 and 9 above. For $E[Utilization^k|Crisis]$ we estimate a quarterly regression for the respective firm type of the utilization rate on the S&P 500 return (in the spirit of Figure 1) and predict the fitted value for a 40% market downturn. For γ^k, we take the coefficients from Table A4. For REITs, we find a $E[Utilization^k|Crisis]$ of 0.451 with the same number for non-REITs being 0.308. That is, in a downturn REITs' utilization rate is 15 percentage points higher than the one of non-REITs. When we lump all borrowers together the stressed utilization rate becomes 0.316, almost indistinguishable from the one of non-REITs. Regarding γ^k, we find that the stock market punishes banks for higher credit commitments to REITs by

more than for overall credit commitments and/or CRE exposure. In Panel B we display the results when ignoring heterogeneity between REIT and non-REIT borrowers. In Panel C we show the results when considering heterogeneity, as in equations 8 and 9. Panels D and E then compare the effect from market revaluation between the exercise with no heterogeneity, the exercise with REIT heterogeneity, and the exercise with CRE exposure in absolute numbers and percent relative to baseline SRISK from VLab, respectively. Figure 9 then depicts a histogram of the incremental SRISK values stemming from the market revaluation effects relative to current equity market value.

Firstly, starting with Panel B of Table 10, we see that taking into account off-balance sheet commitments without distinguishing between borrower types increases the expected capital shortfall by $8.1 billion for JP Morgan – the largest bank in our sample – and by $55.1 billion when adding up all of the publicly traded banks in our sample. Similarly, the off-balance sheet commitments result in a revaluation of JP Morgan's equity by $24.5 billion and $125.1 billion for the banking sector as a whole. In sum, JP Morgan therefore needs an additional capital under market-wide stock market correction of 40% of $32.6 billion, and the banking sector an additional $180.2 billion, due to contingent off-balance sheet liabilities being drawn down and manifesting as on-balance sheet loans with attendant equity reduction effects.

How important is borrower heterogeneity (REIT vs. Non-REIT)? In Panel C, we take into account that REIT borrowers draw down at higher rates and that the market corrects bank stock valuations more strongly when they have exposure to REITs (as documented in Panel A and Section 6.1). That is, we estimate the SRISK components using equations (8) and (9). While the contingent capital is almost unaffected, the impact from market revaluation is substantially higher. For example, this impact is $29.5 billion for JP Morgan instead of $24.5 billion in Panel B.

Panel D then summarizes the market impact from Panels B and C as well as from CRE exposure in absolute values. Panel E provides the same comparison, relative to the baseline SRISK, in percent. Focusing on the percentage numbers in Panel E, we find that for all publicly traded banks in our sample, the market impact of overall credit line

business is 20% of baseline SRISK, the market impact of considering REIT as their own borrower class is 25.7% of baseline SRISK and the market impact of CRE exposure is 0.4% of baseline SRISK. Those results produce two important insights. First, ignoring that REITs are special as credit line borrowers significantly underestimates systemic risk in the banking sector. Second, the credit line business, both in general and specifically with REIT borrowers, is multiple times as important as CRE exposure for large publicly traded banks that are part of the SRISK sample. The bank-level histograms and distributions depicted in Figure 9 underscore these findings. Panel A shows very modest impacts of direct on-balance-sheet CRE exposures on the incremental SRISK (market revaluation effect) of less than 1% of current market value. The impact on the current market value of banks' total credit line business in Panel B averages at 7% without considering REIT heterogeneity. When considering REITs as a special borrower class in banks' total credit line business, the average grows to 10% with several values extending beyond 20% of current market value, highlighting the importance of indirect CRE exposure from credit lines to REITs.

8 Conclusion

Our paper sheds light on the implications of bank credit lines to non-bank financial intermediaries (NBFIs). Using real estate investment trusts (REITs) that invest in commercial real estate (CRE) as a leading example, we document that a big portion of large banks' CRE exposure is through the provision of credit lines to REITs. Ignoring these exposures could lead to an underestimation of the risks in banks' portfolios, especially under stress. This notion generalizes to the provision of credit lines to other NBFIs, which exposes banks both to the risks of NBFI's idiosyncratic asset and liability choices as well as risks of systemic shortages of liquidity in the financial sector.

For REITs in particular, we document that they feature higher average credit line utilization rates than non-financial borrowers both in normal times and in times of systemic as well as sector-specific stress. We show how these higher drawdowns and the associated

capital encumbrance for banks lead to a reduction in stock returns in crisis times for banks with higher credit line exposure to REITs. We incorporate these findings into calculations of expected capital shortfall under stress (SRISK) to quantify the systemic importance of extending credit lines to REITs. We find that ignoring the unique properties of REITs as a borrower class could underestimate the capital needed in the US banking system by a substantial 35%. This analysis also serves as an input for policy makers to trial the current uniform capital requirements in place for credit lines. Conversion factors from credit lines to capital requirements should reflect the expected drawdown intensity of the line, at least if it differs as starkly as it does for REITs vs. non-REIT borrowers.

Finally, we provide evidence that banks do offer credit lines at similar rates to REITs and other borrowers - at odds with intuition based on our findings of greater (idiosyncratic and systematic) drawdown risk on REIT credit lines compared to other bank borrowers. This calls for further research analyzing the complex structure of credit line contracts being issued to REITs and other NBFIs, e.g. along the lines of covenants and their state-contingent invocation. Moreover, the risks flowing back from the NBFI sector to the banking sector, in particular through the channel of contingent liquidity provision in the form of credit lines, also deserves further attention in terms of efficient policy responses to contain systemic risk implications.

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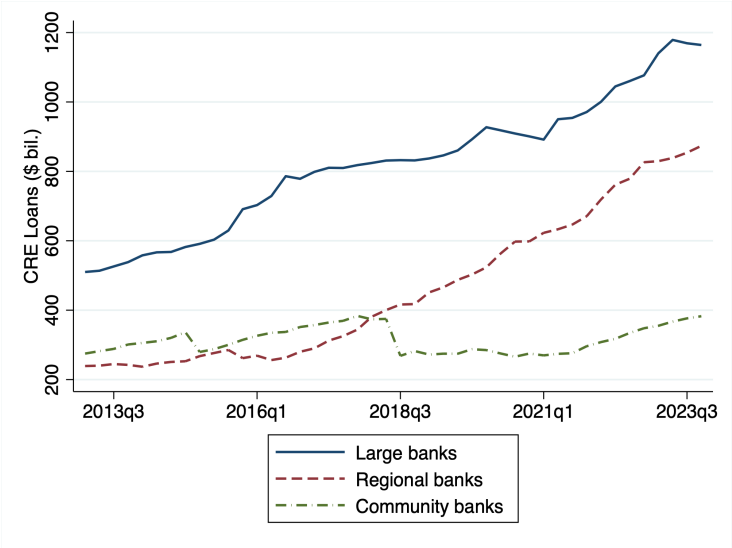
Figure 2: Commercial Real Estate (CRE) loans by bank type

This figure shows the total reported on-balance sheet exposure to the commercial real estate market (CRE, Panel A) and CRE exposure scaled by the total book value of equity of the bank (Panel B). Data is from the FR Y-C (FDIC Call Reports) at the quarterly frequency from 2013Q1 to 2023Q4. We split banks into three types: community banks (assets $<$ 10$ billion), regional banks (assets between 10$ and 100$ billion), and large banks (assets over 100$ billion).

Panel A - Total CRE Exposure - by bank size



Panel B - CRE Exposure Scaled By Equity - by bank size

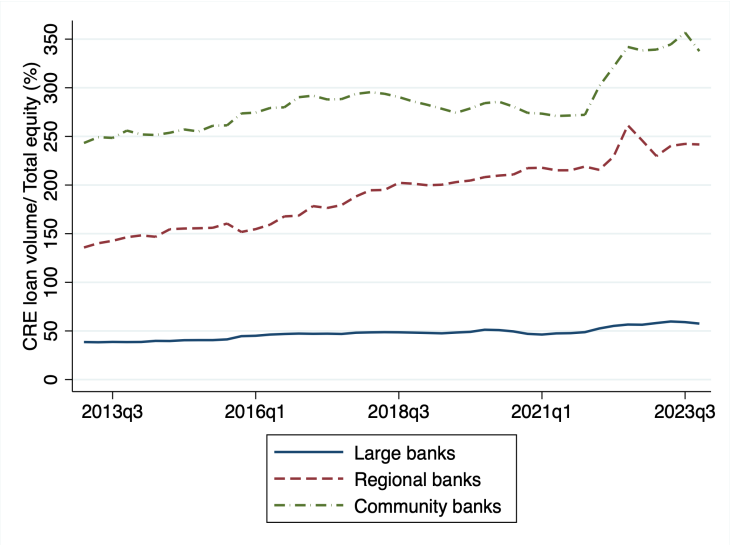


Figure 3: Banks' Exposure to Commercial Real Estate (CRE) by bank type

This figure shows the total exposure of banks to commercial real estate (CRE) by stacking their direct exposure through on-balance sheet CRE loans and indirect exposure through banks' term loans and credit lines to Real Estate Investment Trusts (REITs). Banks are classified as follows: community banks (assets $<$ 10$ billion), regional banks (assets between 10$ and 100$ billion), and large banks (assets over 100$ billion). Data is from DealScan, FR-Y9C filings, and Capital IQ. Data is as of 2023Q4.

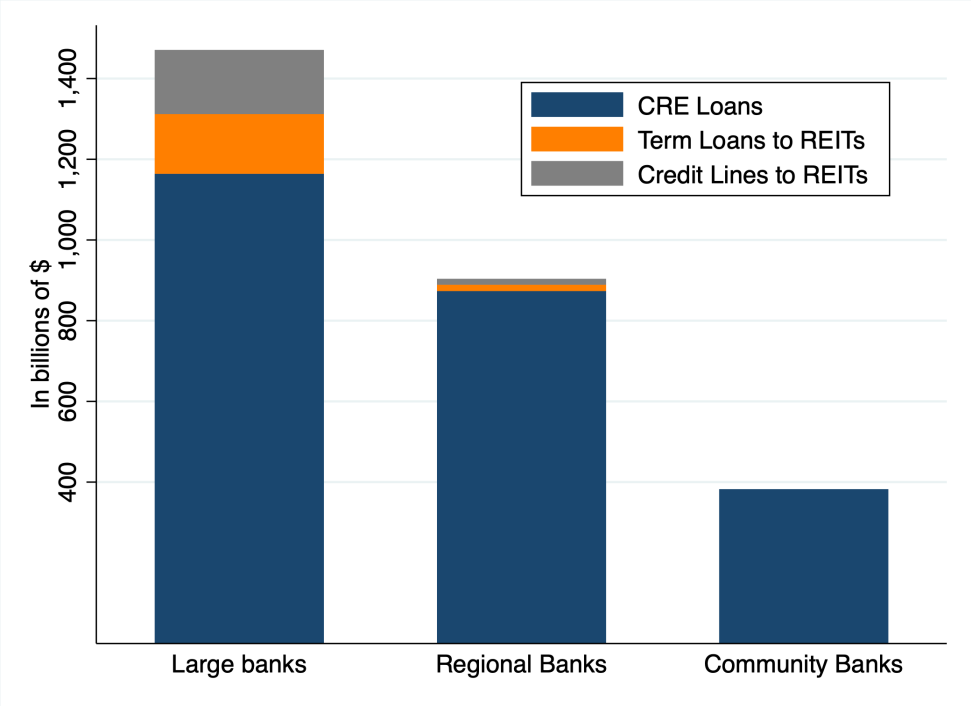
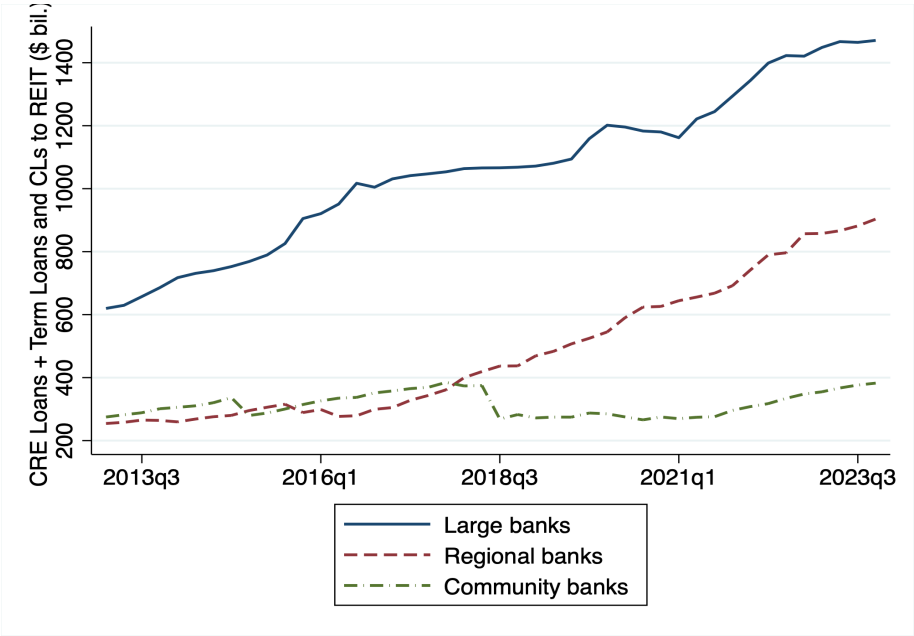


Figure 4: Banks' Exposure to Commercial Real Estate (CRE) by bank type

Panel A shows the total exposure of banks to commercial real estate (CRE) including their direct exposure through on-balance sheet CRE loans and indirect exposure through banks' term loans and credit lines to Real Estate Investment Trusts (REITs). Banks are classified as follows: community banks (assets $<$ 10$ billion), regional banks (assets between 10$ and 100$ billion), and large banks (assets over 100$ billion). In Panel B, we document the direct CRE exposure as well as total CRE exposure (direct CRE + REIT CL and TL exposure) for large banks. Data is from DealScan, FR-Y9C filings, and Capital IQ.

Panel A - Direct and indirect exposure to CRE by bank type from 2013Q1 to 2023Q4



Panel B - Incremental CRE Exposure from REITs for Large Banks from 2013Q1 to 2023Q4

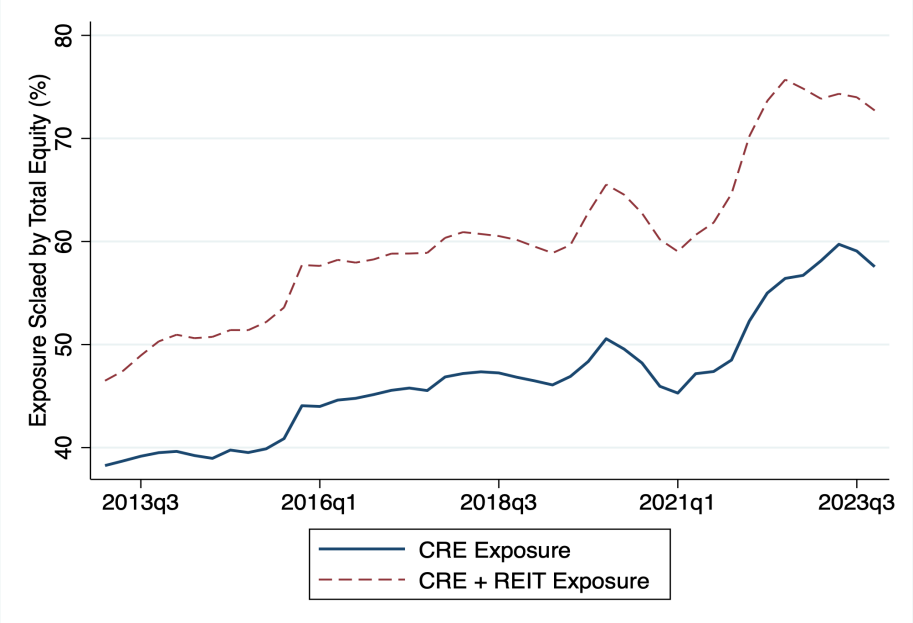
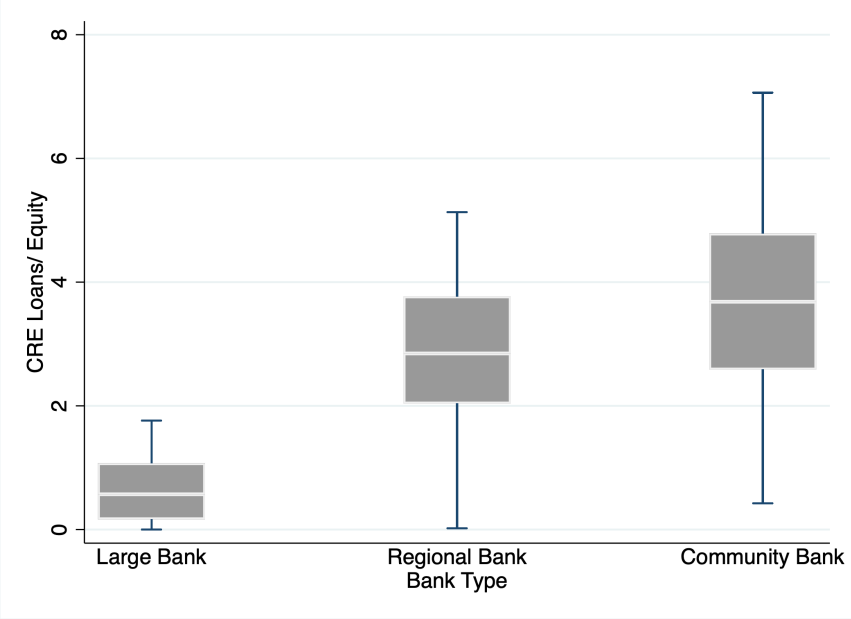
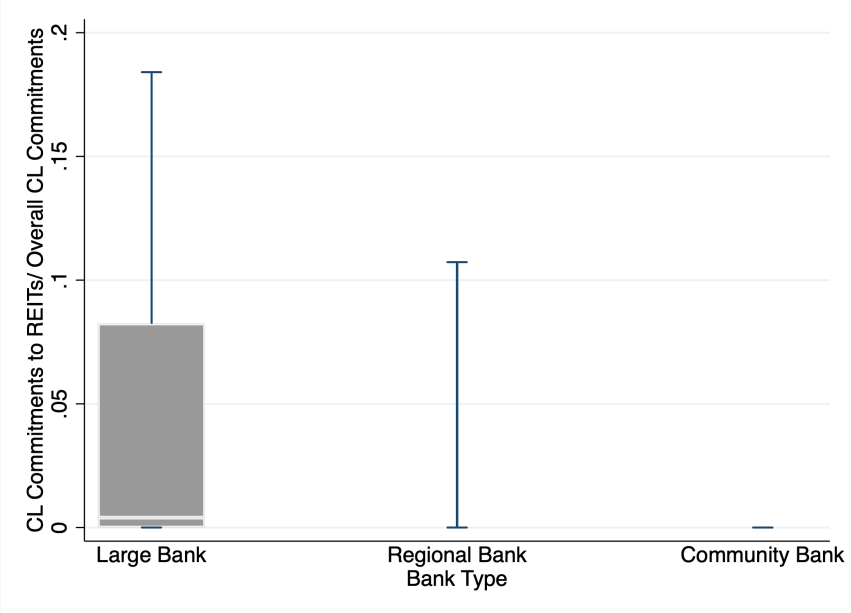


Figure 5: CRE exposure box plots by bank type

This figure compares the distribution of bank exposure to CRE and REITs. The box plots the 25th, median, and 75th percentile, while the caps denote the 5th and 95th percentile of the distribution. Banks are classified as follows: community banks (assets < 10$ billion), regional banks (assets between 10$ and 100$ billion), and large banks (assets over 100$ billion). The distribution is based on bank call report data as of 2023Q4.



(a) CRE Loans/ Equity



(b) Credit Lines to REITs/ Total Credit Lines

Figure 6: Credit line utilization rates by borrower category – volume-weighted average

This figure plots the average credit line utilization rate by borrowers in each quarter. We define the utilization rate as the drawn portion of total credit line commitments. This figure plots the value-weighted average (weighted by total balance of each borrower). We separate borrowers into three groups - REITs, NBFIs excluding REITs, and non-financial firms. Data is from 2010Q1 to 2023Q4 and is obtained from Capital IQ.

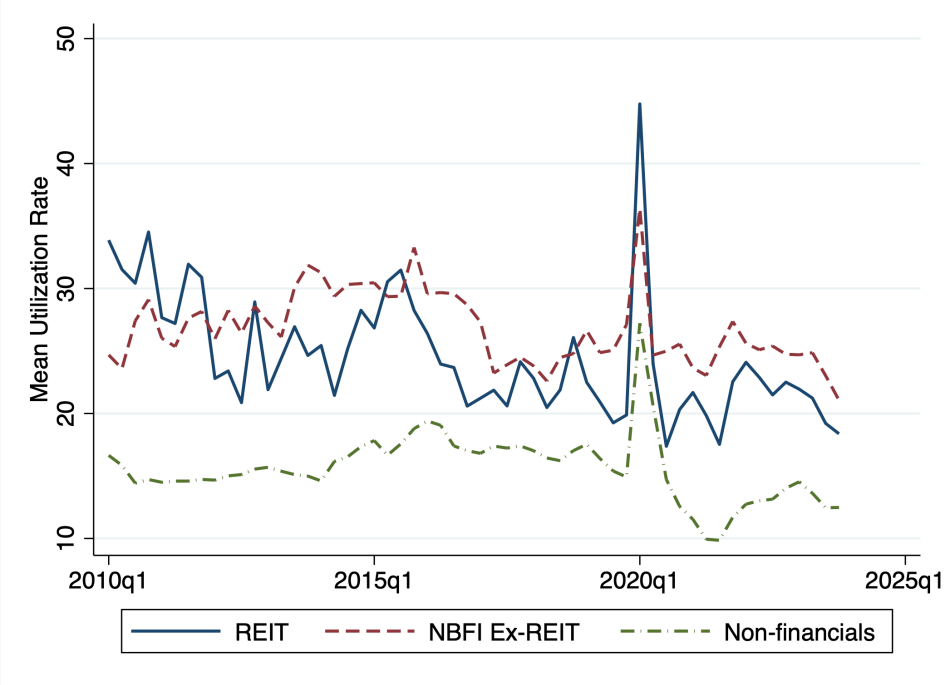


Figure 7: REIT Covid stock market performance by subsector

This figure plots the quarterly stock market returns of various REIT subsectors from 2019Q1 to 2023Q4. All stock prices are scaled by values in 2019Q4, before the onset of the COVID-19 pandemic. Indices are created as a weighted average of individual REIT prices, with the weights corresponding to the market capitalization of each REIT in 2019Q4. Stock price data is from CRSP.

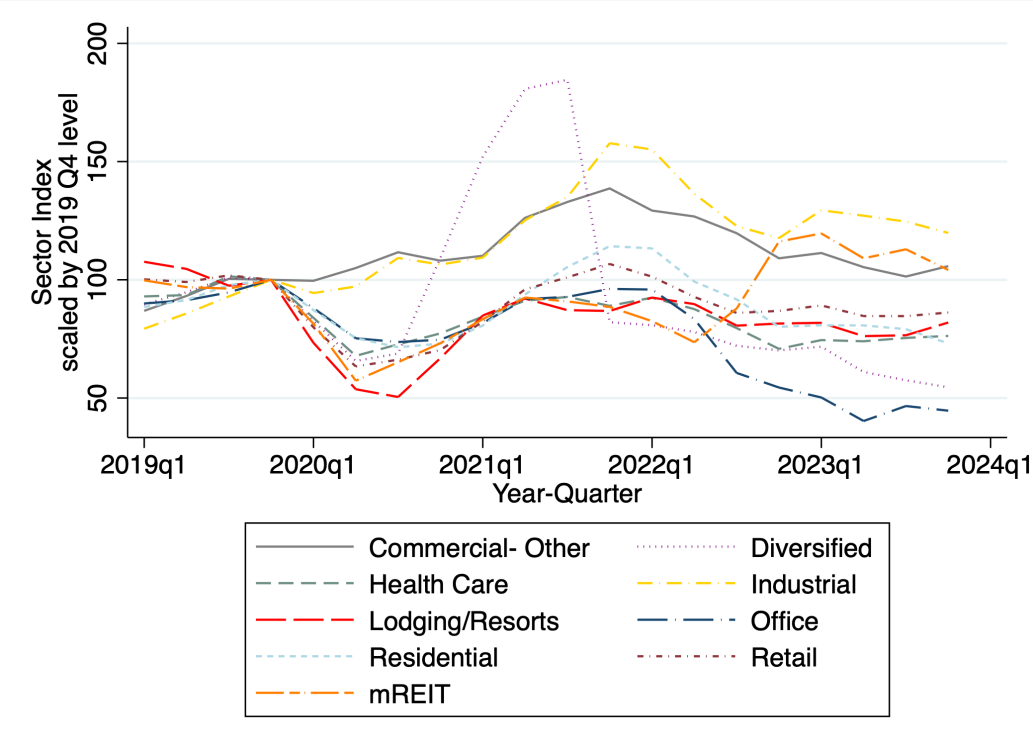


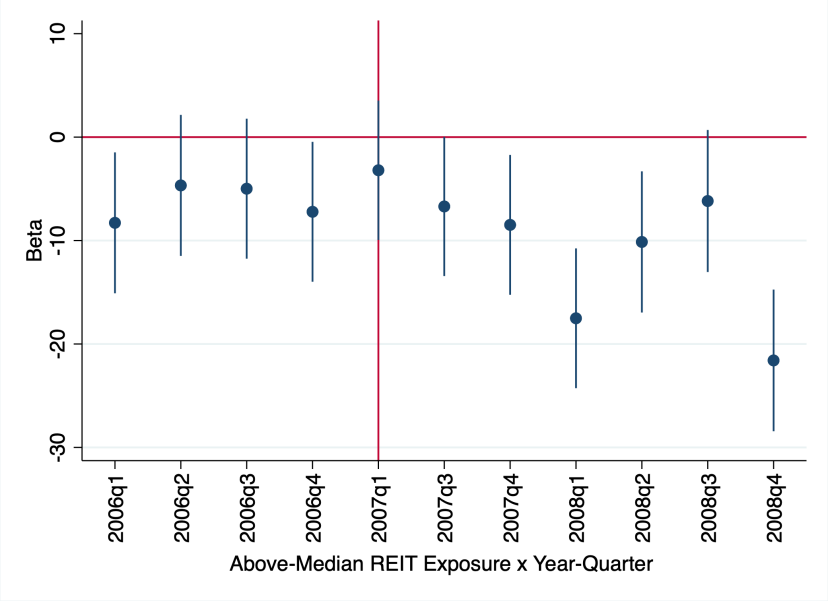
Figure 8: Bank stock market performance by REIT exposure

The figure plots the regression coefficients from the following regression

$$\text{BankStockReturn}_{it} = \beta_{it}\text{High REIT CL Commitments}_i \times \mathbf{1}_t + X_{it} + \alpha_i + \gamma_t + \epsilon_{it},$$

for bank i in quarter t. *High REIT Commitments* is an indicator that takes a value of one if the share of total bank credit lines originated to REITs to total assets is above the median. Control variables are the same as in Table 7 which includes Fama-French 3 factors, term loan exposure to REITs and direct CRE exposure.

Panel A - GFC



Panel B - COVID-19

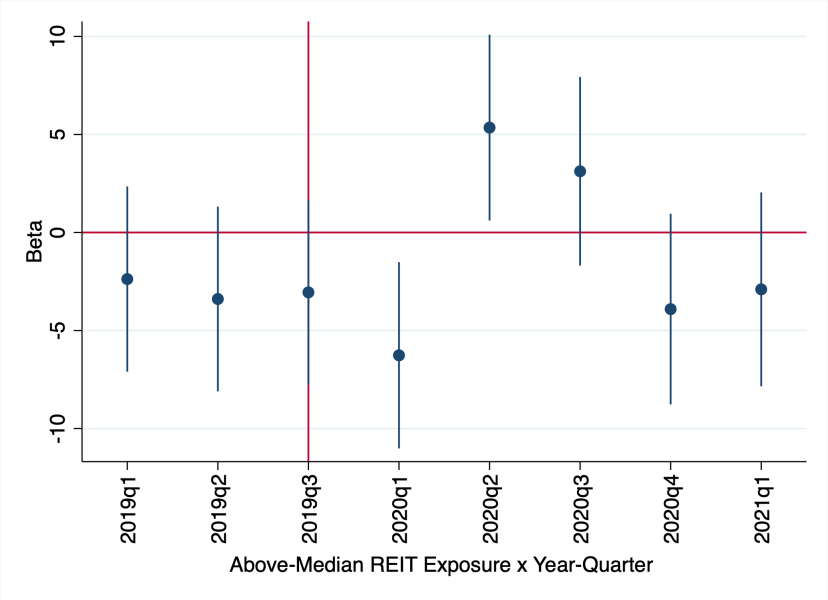
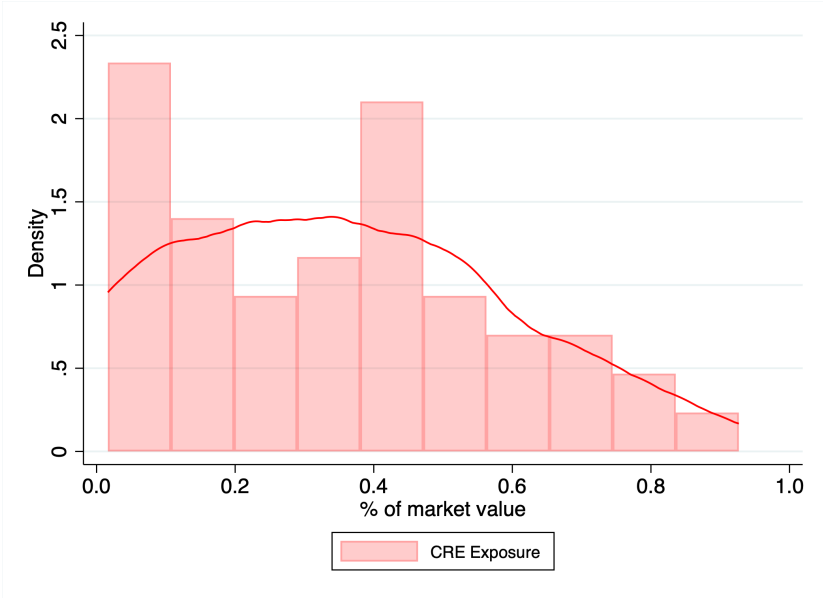


Figure 9: Incremental SRISK (market revaluation effect) relative to current market equity value

This figure depicts the distribution of the market impact of the three scenarios analyzed in Panel D of Table 10 relative to banks' market valuation as of 2023Q4, both as histograms (bars) and as kernel density estimates (lines). Panel A shows the distribution for direct CRE exposure. Panel B shows the distributions for banks' credit line business with or without considering REIT heterogeneity.

Panel A - Direct CRE exposure



Panel B - Credit line business

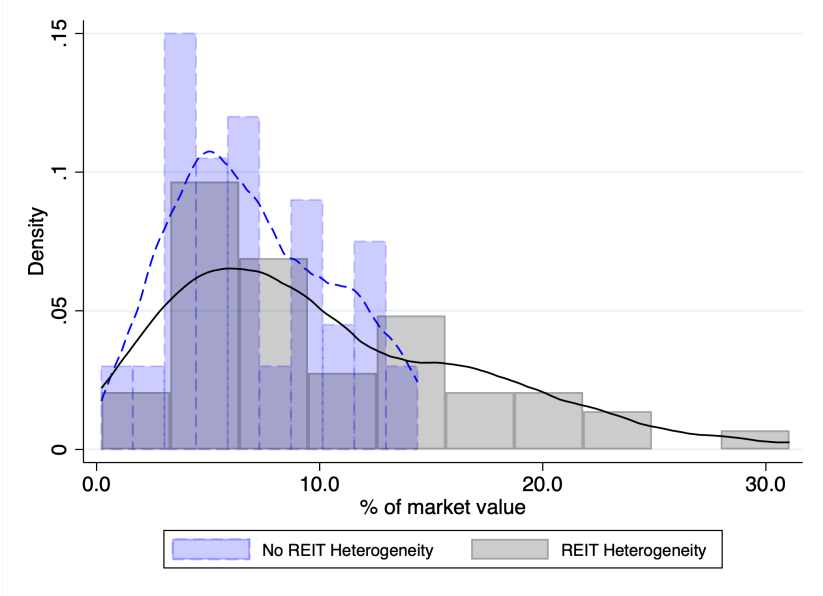


Table 1: Summary Statistics - Borrower and Loan Characteristics

This table displays descriptive statistics of our dataset. Panel A shows descriptive statistics at the borrower-quarter level taken from Capital IQ and Compustat. Numbers are averages over the 2005–2023 period. Panel B shows descriptive statistics on the credit line contract terms from DealScan. We split borrowers into three groups: REITs, NBFIs excluding REITs, and non-financial companies.

Panel A - Firm Characteristics

Log(Assets in mil.) measures firm size, *Debt/Equity* measures firm leverage, *Credit Line/Assets* measures the ratio of bank credit lines to firm assets, *Secured Facility Share* measures the share of total committed credit line volume that is issued as a secured facility, *Liquidity/Assets* measures the amount of liquidity available to the firm as cash and cash equivalents minus debt in current liabilities, *Short Term Debt Ratio* measures the share of short term (maturity of less than 1 year) debt to total debt of the firm, and *Debt Issuance/Assets* measures the average size of a firm's bond issuance. These variables are winsorized at the 1% and 99% level. *Unrated* is the share of firms without a credit rating. *Rating* is the average rating of the firm after converting credit ratings to a numerical scale with 1 for AAA, 2 for AA, and so on. Unrated firms are given a rating value of 10.

	Equal-Weighted			Value-Weighted		
	REIT	NBFI Ex-REIT	Non-financial	REIT	NBFI Ex-REIT	Non-financial
Log(Assets in mil.)	8.11	8.81	7.80	9.42	12.05	10.67
Debt/Equity	1.80	1.79	1.07	2.77	4.43	1.32
Credit Line/Assets	0.17	0.16	0.19	0.13	0.02	0.08
Secured Facility Share	0.20	0.31	0.47	0.17	0.08	0.18
Liquidity/Assets	-0.00	0.07	0.05	-0.01	-0.01	0.04
Short Term Debt Ratio	0.09	0.19	0.14	0.08	0.32	0.14
Debt Issuance/Assets	0.14	0.11	0.14	0.12	0.03	0.07
Unrated	0.11	0.21	0.17	0.06	0.07	0.09
Rating	4.39	3.84	4.59	4.21	3.09	3.64
Observations	1118	1352	13696	1118	1352	13695

Panel B - Loan Characteristics

Loan size (mil.) measures size of the credit line balance, *(Un)drawn spread* is the cost on the (un)drawn portion of the credit line. *Maturity* is the average maturity of the credit line in months. These variables are winsorized at the 1% and 99% level. *Financial (General) Covenants* measures the share of credit lines that have any financial (general) covenant.

	Equal-Weighted			Value-Weighted		
	REIT	NBFI Ex-REIT	Non-financial	REIT	NBFI Ex-REIT	Non-financial
Loan Size (mil.)	613.03	755.03	344.82	1,240.74	1,758.05	1,846.24
Drawn spreads (bps)	168.31	167.57	239.83	148.03	97.93	135.51
Undrawn spreads (bps)	26.05	24.37	31.42	22.04	13.08	17.89
Maturity (months)	42.76	41.63	47.84	44.27	36.80	44.67
Financial Covenanats	0.60	0.45	0.22	0.64	0.25	0.37
General Covenanats	0.22	0.27	0.14	0.19	0.05	0.13
Observations	1228	1627	49710	1222	1556	15675

Table 2: Credit line utilization by company types and rating group

Panel A - Full sample

The table shows the average number, total committed balance on credit lines (in mil. of $), and credit line utilization rates (in percentage), for borrowers by rating. The average is calculated over the sample from 2005Q1 to 2023Q4. We differentiate between three borrower groups: non-financial companies, REITs, and non-REIT NBFIs. Rating groups are: all As, BBB, non-IG, and unrated.

	All	AAA-A	BBB	Non-IG	Unrated
Number of REITs in a quarter	92.81	7.00	45.91	26.33	125.24
REIT - Total CL balance ($ mil.)	650.65	2,160.85	1,041.88	736.87	415.52
REIT - Avg. Utilization (%)	29.42	8.07	20.17	25.39	34.71
REIT - Wt. Avg. Utilization (%)	27.60	11.61	22.47	30.17	33.21
Number of NBFI Ex-REIT in a quarter	399.91	36.98	50.26	34.07	488.04
NBFI Ex-REIT - Total CL balance ($ mil.)	708.68	2,461.15	1,230.86	859.16	355.13
NBFI Ex-REIT - Avg. Utilization (%)	34.54	8.80	17.34	24.87	42.41
NBFI Ex-REIT - Wt. Avg. Utilization (%)	26.08	12.62	20.83	36.10	40.99
Number of Non-financials in a quarter	1,635.29	141.47	294.54	539.06	2,203.69
Non-financial - Total CL balance ($ mil.)	506.98	1,809.61	1,399.36	583.93	233.49
Non-financial - Avg. Utilization (%)	22.37	5.14	9.83	19.35	26.73
Non-financial - Wt. Avg. Utilization (%)	16.87	3.18	9.75	26.10	24.17

Panel B - Crisis vs. normal times

The table shows the credit line utilization rates (in percentage) for borrowers by rating and by time period. The sample ranges from 2005Q1 to 2023Q4, where 2020Q1 is classified as the Covid-19 episode and 2007Q3 to 2009Q2 as the Global Financial Crisis (GFC) episode. We differentiate between three borrower groups: non-financial companies, REITs, and non-REIT NBFIs. Rating groups are: all As, BBB, non-IG, unrated.

	All	AAA-A	BBB	Non-IG	Unrated
REIT - Utilization (%) - normal times	28.36	7.00	19.27	24.56	33.74
REIT - Utilization (%) - GFC	37.96	20.43	27.18	31.71	41.66
REIT - Utilization (%) - Covid-19	47.91	24.04	42.88	56.87	51.08
NBFI Ex-REIT - Utilization (%)- normal times	34.76	8.57	16.48	24.64	42.90
NBFI Ex-REIT - Utilization (%) - GFC	31.32	10.38	24.80	25.48	36.57
NBFI Ex-REIT - Utilization (%) - Covid-19	41.18	10.86	25.52	34.41	49.17
Non-financial - Utilization (%) - normal times	21.66	4.35	8.75	18.24	26.30
Non-financial - Utilization (%) - GFC	27.24	12.51	19.00	27.08	29.32
Non-financial - Utilization (%) - Covid-19	32.90	12.48	18.66	39.35	35.38

Table 3: Differential credit line utilization of REITs

The table presents results of running regression specification 1. The sample ranges from 2005Q1 to 2023Q4. *REIT* takes a value of one for REITs and zero for all other financial and non-financial firms. *NBFI Ex-REIT* takes a value of one for non-bank financial firms excluding REITs, and zero otherwise. Panel A compares REITs with all other companies. Panel B splits companies into three groups: REITs, non-financial firms, and NBFIs excluding REITs. The omitted group is non-financial borrowers in both Panels. We add the logarithm of total assets, firm leverage (debt to equity), the level of liquid assets over total assets, short-term debt to total debt, return on assets, quarterly debt issuance to assets as borrower controls, as well as an indicator for whether the remaining volume-weighted maturity on outstanding credit lines is less than 1 year as control variable starting in Column (2). All continuous variables are standardized to have a mean of 0 and standard deviation of 1. Columns (1) to (4) sequentially add fixed effects as indicated at the bottom of the table. Column (5) restricts the sample to the years 2010–2019. Standard errors are clustered at the borrower level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - REITs compared non-REIT borrowers

	Utilization Rate (%)				
	(1)	(2)	(3)	(4)	(5)
REIT	5.547***	5.245**	5.219**	5.109**	5.263*
	(0.274)	(2.165)	(2.165)	(2.170)	(2.711)
Log(Assets in mil.)		−4.273***	−4.282***	−4.316***	−4.297***
		(0.414)	(0.421)	(0.418)	(0.513)
Debt/Equity		0.673***	0.655***	0.599***	0.588***
		(0.169)	(0.169)	(0.170)	(0.217)
Liquidity/Assets		−8.723***	−8.622***	−8.650***	−8.579***
		(0.403)	(0.402)	(0.402)	(0.504)
Short Term Debt Ratio		2.475***	2.544***	2.556***	3.130***
		(0.303)	(0.303)	(0.302)	(0.377)
Return on Assets		−0.437	−0.291	−0.350	0.619
		(0.354)	(0.352)	(0.354)	(0.416)
Debt Issuance/Assets		3.957***	4.212***	4.192***	4.132***
		(0.192)	(0.203)	(0.204)	(0.251)
Maturity < 1 year		−1.067**	−0.928*	−0.791*	−0.685
		(0.479)	(0.477)	(0.477)	(0.622)
Rating FE	N	Y	Y	N	N
Rating Group FE	N	N	N	Y	Y
Year-Quarter FE	N	N	Y	Y	Y
Sample					2010-2019
Obs.	229,677	169,635	169,635	169,635	93,129
R^2	0.002	0.196	0.205	0.203	0.216

Panel B - REITs compared to other NBFIs and non-financial borrowers

	Utilization Rate (%)				
	(1)	(2)	(3)	(4)	(5)
REIT	5.547***	5.856***	5.826***	5.716***	5.947**
	(0.274)	(2.176)	(2.176)	(2.181)	(2.723)
NBFI Ex-REIT		6.750***	6.683***	6.687***	8.190***
		(0.993)	(0.991)	(0.993)	(1.234)
Log(Assets in mil.)		−4.619***	−4.629***	−4.665***	−4.692***
		(0.415)	(0.422)	(0.419)	(0.511)
Debt/Equity		0.574***	0.557***	0.501***	0.484**
		(0.169)	(0.169)	(0.170)	(0.217)
Liquidity/Assets		−8.759***	−8.659***	−8.688***	−8.626***
		(0.404)	(0.403)	(0.404)	(0.507)
Short Term Debt Ratio		2.342***	2.411***	2.423***	3.005***
		(0.302)	(0.302)	(0.302)	(0.376)
Return on Assets		−0.386	−0.239	−0.298	0.666
		(0.355)	(0.352)	(0.354)	(0.417)
Debt Issuance/Assets		3.917***	4.171***	4.150***	4.089***
		(0.191)	(0.203)	(0.203)	(0.251)
Maturity < 1 year		−1.182**	−1.045**	−0.908*	−0.903
		(0.476)	(0.475)	(0.474)	(0.615)
Rating FE	N	Y	Y	N	N
Rating Group FE	N	N	N	Y	Y
Year-Quarter FE	N	N	Y	Y	Y
Sample					2010-2019
Obs.	229,677	169,635	169,635	169,635	93,129
R^2	0.002	0.199	0.209	0.206	0.221

Table 4: Differential credit line utilization of REITs as a function of stock returns

The table presents results on the impact of market conditions on borrower credit line utilization. The sample period is 2005Q1 to 2023Q4. In Column (1), we analyze the sensitivity of credit line drawdowns to stock market performance (S&P 500). In Column (2), we separate the impact of positive and negative market perfomance on credit line utilization. In Column (3), we analyze the sensitivity of credit line utilization to market volatility (VIX). In Column (4), we analyze the sensitivity of credit line utilization in crisis times. *Crisis* is an indicator that takes a value of one during the GFC (2007Q3-2009Q2) and COVID-19 (2020Q1). In Column (5), we analyze credit line utilization to a borrower's industry performance (sub-sector return) after excluding the borrower from the calculations of industry performance. Sub-sector return is measured as a weighted average of quarterly stock returns for firms in the same 2-digit SIC code for non-REITs and REIT-sub group classification for REITs. For REITs, sub-sector return is based on REIT classification into one of 9 sub-groups - Health Care, Industrial, Lodging/Resorts, Mortgage, Office, Residential, Retail, Diversified, or Commercial- Other. We then look at the impact of own industry conditions on borrower utilization. In column (6), (7) and (8), we include measures of aggregate credit conditions as measured by the Excess Bond Premium (EBP, see Gilchrist and Zakrajšek (2012)), Excess Loan Premium (ELP, see Saunders et al. (Forthcoming)), and spreads on financial commercial paper. *REIT* takes a value of one for REITs and zero for all other NBFI and non-financial firms. We add the logarithm of total assets, the level of liquid assets over total assets, firm leverage (debt to equity), short term debt over total debt ratio, the return of assets and debt issuance over total assets as control variables in all columns. All continuous variables are standardized to have a mean of 0 and standard deviation of 1. Standard errors are clustered at the borrower level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

	Utilization Rate (%)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
REIT	4.758***	3.844**	4.792***	4.188***	3.733**	4.743***	4.950***	4.796***
	(1.410)	(1.504)	(1.410)	(1.505)	(1.654)	(1.414)	(1.472)	(1.407)
REIT x S&P 500 return	-2.187***					-2.228***	-2.145***	-2.315***
	(0.504)					(0.503)	(0.545)	(0.499)
REIT x Positive S&P 500 return		-0.410						
		(1.223)						
REIT x Negative S&P 500 return		-3.065***						
		(0.790)						
REIT x VIX			1.913***					
			(0.715)					
REIT x Crisis				5.043**				
				(2.339)				
REIT x Sub-sector return					-2.978***			
					(0.885)			
REIT x EBP						-0.109		
						(0.662)		
REIT x ELP							0.584	
							(0.938)	
REIT x CP Spread								-0.344
								(0.822)
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Rating Group FE	Y	Y	Y	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y
Obs.	174,686	174,686	174,686	174,686	115,514	174,686	161,521	174,686
R^2	0.195	0.195	0.195	0.195	0.194	0.195	0.192	0.195

Table 5: Effect of share redemption on REIT drawdowns

This table shows results of regressing the log change in the drawn credit line volume for each REIT on the shares redeemed measued as the log change in the number of common shares between the previous and current quarter. The sample period is 2005Q1 to 2023Q4. Column (2) adds REIT fixed effects. Column (3) adds time fixed effects. Column (4) adds the logarithm of total assets, firm leverage (total debt to equity), the level of liquid assets over total assets, the ratio of short-term debt to total debt, and the size of quarterly debt issuance over total assets as control variables. Column (5) adds interaction terms of the controls added in column (4) and a crisis indicator that takes a value of one during the GFC (2007Q3-2009Q2) and COVID-19 (2020Q1). Control variables are standardized to have a mean of 0 and standard deviation of 1. Standard errors are clustered at the REIT-level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

	Δ Drawn CL Volume				
	(1)	(2)	(3)	(4)	(5)
Shares Redeemed	0.435***	0.540***	0.547***	0.685**	0.635*
	(0.166)	(0.180)	(0.182)	(0.330)	(0.344)
Log(Assets in mil.)				0.049	0.049
				(0.088)	(0.088)
Liquidity/Assets				-0.138**	-0.142**
				(0.066)	(0.068)
Debt/Equity				-0.015	-0.019
				(0.017)	(0.016)
Short Term Debt Ratio				-0.061	-0.060
				(0.052)	(0.053)
Debt Issuance/Assets				-0.004	-0.005
				(0.015)	(0.016)
Shares Redeemed x Crisis					1.087
					(0.776)
Log(Assets in mil.) x Crisis					0.028
					(0.059)
Liquidity/Assets x Crisis					0.115
					(0.111)
Debt/Equity x Crisis					0.016
					(0.026)
Short Term Debt Ratio x Crisis					0.002
					(0.063)
Debt Issuance/Assets x Crisis					0.011
					(0.025)
REIT FE	N	Y	Y	Y	Y
Year-Quarter FE	N	N	Y	Y	Y
Obs.	8,628	8,621	8,621	3,056	3,056
R^2	0.001	0.023	0.054	0.113	0.113

Table 6: Reasons for credit line utilization by REITs - Crisis vs. normal times

The table presents results of running regression specification 4. The sample period is 2005Q1 to 2023Q4. Crisis takes a value of one for the GFC (2007Q3 to 2009Q2) and the Covid-19 period (2020Q1) and zero otherwise. Drawdown is the change in the dollar value of used credit line balance between the current and previous quarter. Panel A shows the results for investments, Panel B shows the results for cash and cash equivalents, and Panel C shows the results for total dividend payout. Standard errors are clustered at the firm-level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - Investment ($)

	(1) h=0	(2) h=1	(3) h=2	(4) h=3	(5) h=4
Drawdown (in USD) in t	0.339***	0.331***	0.336***	0.374***	0.408***
	(0.080)	(0.090)	(0.086)	(0.095)	(0.114)
Drawdown (in USD) in t x Crisis	-0.263	-0.219	-0.260	-0.248	-0.267
	(0.169)	(0.181)	(0.209)	(0.246)	(0.295)
Firm FE	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y
Obs.	12,979	12,611	12,227	11,949	11,577
R^2	0.069	0.110	0.147	0.186	0.226

Panel B - Cash and cash equivalents ($)

	(1) h=0	(2) h=1	(3) h=2	(4) h=3	(5) h=4
Drawdown (in USD) in t	-0.0663	-0.0520**	-0.00724	-0.0166	-0.0247
	(0.040)	(0.021)	(0.021)	(0.036)	(0.022)
Drawdown (in USD) in t x Crisis	0.719***	0.339***	0.145	0.113	0.0839
	(0.129)	(0.087)	(0.105)	(0.103)	(0.090)
Firm FE	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y
Obs.	13,277	12,919	12,543	12,219	11,887
R^2	0.264	0.311	0.353	0.387	0.413

Panel C - Total Dividend Payout ($)

	(1) h=0	(2) h=1	(3) h=2	(4) h=3	(5) h=4
Drawdown (in USD) in t	0.00623	-0.00145	-0.00226	-0.000199	0.00334
	(0.004)	(0.003)	(0.003)	(0.002)	(0.003)
Drawdown (in USD) in t x Crisis	0.0227**	-0.00784	-0.0135	-0.0180**	-0.0162*
	(0.009)	(0.018)	(0.008)	(0.009)	(0.010)
Firm FE	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y
Obs.	12,988	12,617	12,242	11,907	11,580
R^2	0.196	0.207	0.222	0.200	0.254

Table 7: Effect of REIT Exposure on Bank Stock Returns – Crisis

This table shows results of regressing bank stock returns on bank credit line commitment levels scaled by total assets as well as on a crisis indicator. The sample period is 2005Q1 to 2023Q4. The crisis indicator takes the value 1 for the GFC (2007Q3 to 2009Q2) and the Covid-19 period (2020Q1). Column (2) replaces the overall credit line commitments by REIT credit line commitments scaled by total assets. Column (3) adds non-REIT credit line commitments scaled by total assets. Column (4) adds term loans to REITs scaled by total assets. Column (5) adds the on-balance sheet exposure to CRE scaled by total assets. All these terms are added jointly with an interaction with the crisis dummy. All columns employ bank and time fixed effects, a set of controls close to the setup in Acharya et al. (2024b) and the Fama-French 3-factor model. All continuous variables are standardized to have a mean of 0 and a standard deviation of 1. Standard errors are clustered at the bank-level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

	Quarterly bank stock returns (%)				
	(1)	(2)	(3)	(4)	(5)
Overall Commitments (std.)	0.176				
	(0.223)				
Overall Commitments (std.) x Crisis	-0.794*				
	(0.425)				
REIT CL Exposure (std.)		-0.104	-0.157	-0.141	-0.122
		(0.147)	(0.152)	(0.153)	(0.148)
REIT CL Exposure (std.) x Crisis		-1.422***	-1.242***	-1.273***	-1.306***
		(0.360)	(0.416)	(0.404)	(0.383)
Non-REIT CL Exposure (std.)			0.175	0.173	0.142
			(0.235)	(0.234)	(0.226)
Non-REIT CL Exposure (std.) x Crisis			-0.522	-0.516	-0.849**
			(0.365)	(0.368)	(0.347)
REIT TL Exposure (std.)				-0.157	-0.0788
				(0.141)	(0.145)
REIT TL Exposure (std.) x Crisis				0.0210	-0.479
				(0.374)	(0.440)
CRE Exposure (std.)					0.145
					(0.311)
CRE Exposure (std.) x Crisis					-2.096***
					(0.512)
Constant	40.13***	41.33***	41.35***	41.53***	41.79***
	(7.759)	(7.834)	(5.937)	(5.945)	(6.024)
Controls	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y
Obs.	8,983	8,983	8,983	8,983	8,983
R^2	0.607	0.608	0.608	0.608	0.609

Table 8: Effect of REIT Exposure on Bank Stock Returns – REIT subsector shocks

This table shows results of regressing bank stock returns on bank credit line commitment levels scaled by total assets as well as on a bank-level shock calculated from exposure to various subsector performances. The sample period is 2005Q1 to 2023Q4. Column (2) replaces the overall credit line commitments by REIT credit line commitments scaled by total assets. Column (3) adds non-REIT credit line commitments scaled by total assets. Column (4) adds term loans to REITs scaled by total assets. Column (5) adds the on-balance sheet exposure to CRE scaled by total assets. All these terms are added jointly with an interaction with the crisis dummy. All columns employ bank and time fixed effects, a set of controls close to the setup in Acharya et al. (2024b) and the Fama-French 3-factor model. All continuous variables are standardized to have a mean of 0 and a standard deviation of 1. Standard errors are clustered at the bank-level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

	Quarterly bank stock returns (%)				
	(1)	(2)	(3)	(4)	(5)
Overall Commitments (std.)	-0.0318				
	(0.234)				
Overall Commitments (std.) x REIT Subsector Shock (std.)	0.0233				
	(0.109)				
REIT CL Exposure (std.)		-0.247*	-0.234	-0.227	-0.221
		(0.148)	(0.158)	(0.158)	(0.149)
REIT CL Exposure (std.) x REIT Subsector Shock (std.)		0.187***	0.197***	0.198***	0.168***
		(0.0637)	(0.0513)	(0.0512)	(0.0458)
Non-REIT CL Exposure (std.)			0.0216	0.0167	0.00861
			(0.206)	(0.205)	(0.206)
Non-REIT CL Exposure (std.) x REIT Subsector Shock (std.)			-0.0491	-0.0500	-0.0128
			(0.0714)	(0.0729)	(0.0657)
REIT TL Exposure (std.)				-0.0866	-0.101
				(0.145)	(0.142)
REIT TL Exposure (std.) x REIT Subsector Shock (std.)				-0.0323	-0.00217
				(0.0279)	(0.0283)
CRE Exposure (std.)					-0.310
					(0.312)
CRE Exposure (std.) x REIT Subsector Shock (std.)					0.206*
					(0.111)
Constant	40.47***	42.01***	41.92***	42.01***	40.73***
	(7.787)	(7.849)	(5.993)	(6.006)	(6.199)
Controls	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y
Obs.	8,983	8,983	8,983	8,983	8,983
R^2	0.607	0.607	0.607	0.607	0.608

Table 9: Loan Pricing

This table compares the various components of loan pricing for REITs and other financial firms to non-financial firms. To obtain the estimation sample we constrain the raw data to only include lead arranger banks. The dependent variable is the all-in-spread drawn (*AISD*) in column (1), the all-in-spread undrawn (*AISU*) in column (2), the commitment fee in column (3), the total cost of borrowing (*TCB*) following Berg et al. (2016) in column (4) and the spread over the reference rate (*Loan spread*) of the term loan in column (5). Columns (1)-(4) provide information on credit line pricing and column (5) shows pricing for term loans. We include the loan maturity in months, loan size measured as the log facility amount, an indicator for whether the loan has a financial covenant, an indicator for whether the loan base rate is linked to SOFR, the firm stock market beta, distance to default, whether the credit line is secured, (Cooperman, Duffie, Luck, Wang, and Yang (2023)) as control variables which we interact with a REIT dummy in Panel B. Further, the logarithm of total assets, the cash-over-assets ratio, leverage, profitability (defined as income over sales), the market-to-book ratio, and share of tangible assets (property, plant, equipment over assets) are included as standalone controls (unreported). Standard errors are clustered at the borrower-level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - baseline

	AISD (bps)	AISU(bps)	Commitment fee (bps)	TCB	Loan spread
	(1)	(2)	(3)	(4)	(5)
REIT	8.565	3.524**	0.457	-6.437	-24.06*
	(7.406)	(1.715)	(2.581)	(7.446)	(13.56)
NBFI (Ex-REIT)	3.577	3.995***	3.152***	18.30***	14.46
	(5.200)	(1.243)	(1.079)	(4.366)	(14.13)
Maturity (months, std.)	-7.796***	-0.107	0.517	-24.14***	-3.946
	(1.633)	(0.367)	(0.317)	(1.788)	(3.797)
Loan Size ($ millions, std.)	-6.934***	-1.056***	-0.430*	-0.773	-3.789***
	(1.889)	(0.321)	(0.247)	(1.089)	(1.465)
Financial Covenant	-12.88***	-1.816***	1.570***	-12.11***	-54.14***
	(2.175)	(0.462)	(0.500)	(1.765)	(5.668)
SOFR linked	10.11	1.962	0.961	42.41***	0.611
	(9.895)	(1.797)	(1.611)	(8.667)	(25.24)
Firm Beta	14.37***	2.752***	1.289**	14.72***	23.54***
	(2.378)	(0.479)	(0.504)	(2.135)	(6.013)
Distance to Default	-1.018***	-0.210***	-0.155***	-1.100***	-1.419
	(0.248)	(0.0533)	(0.0495)	(0.190)	(1.049)
Secured facility	33.04***	8.677***	10.76***	33.25***	72.34***
	(2.746)	(0.614)	(0.619)	(2.576)	(6.929)
Constant	224.8***	31.87***	15.52***	166.9***	327.7***
	(11.02)	(2.479)	(2.226)	(10.40)	(23.34)
Credit Line	Y	Y	Y	Y	N
Rating Group FE	Y	Y	Y	Y	Y
Lender x Year-Quarter FE	Y	Y	Y	Y	Y
Obs.	9,035	7,525	9,738	7,022	4,436
R^2	0.605	0.609	0.482	0.647	0.582

Panel B - adding interactions

	AISD (bps)	AISU(bps)	Commitment fee (bps)	TCB	Loan spread
	(1)	(2)	(3)	(4)	(5)
REIT	-44.43	2.112	5.414	10.87	-80.79
	(31.47)	(5.973)	(7.902)	(24.23)	(60.33)
NBFI (Ex-REIT)	19.70	-1.281	1.200	4.396	-19.01
	(14.41)	(3.732)	(4.107)	(13.56)	(41.22)
Maturity (months, std.)	-9.047***	-0.150	0.399	-24.84***	-3.603
	(1.763)	(0.389)	(0.337)	(1.964)	(3.995)
Loan Size ($ millions, std.)	-7.297***	-1.061***	-0.418	-0.998	-3.868**
	(2.041)	(0.346)	(0.261)	(1.103)	(1.535)
Financial Covenant	-13.51***	-1.831***	1.655***	-12.10***	-55.88***
	(2.228)	(0.465)	(0.518)	(1.848)	(5.874)
SOFR linked	9.812	1.873	0.959	42.28***	5.222
	(9.974)	(1.806)	(1.627)	(8.589)	(25.57)
Firm Beta	15.06***	2.735***	1.250**	14.74***	24.51***
	(2.506)	(0.509)	(0.524)	(2.233)	(6.288)
Distance to Default	-1.004***	-0.222***	-0.156***	-1.128***	-1.685
	(0.251)	(0.0546)	(0.0514)	(0.193)	(1.066)
Secured facility	32.92***	8.663***	10.97***	33.04***	72.67***
	(2.891)	(0.643)	(0.635)	(2.687)	(7.230)
REIT x Maturity (months, std.)	-10.90	-0.691	3.617	9.593	1.491
	(8.972)	(2.314)	(2.526)	(8.193)	(12.25)
REIT x Loan Size ($ millions, std.)	6.830	-0.359	1.829	5.837	3.502
	(6.370)	(0.855)	(2.028)	(3.794)	(27.56)
REIT x Financial Covenant	1.310	0.00775	-1.774	-0.502	26.38
	(12.36)	(2.350)	(3.400)	(11.03)	(31.36)
REIT x SOFR linked	31.40*	7.244***	4.023	7.791	35.23
	(16.94)	(2.725)	(5.395)	(21.67)	(29.30)
REIT x Firm Beta	41.38*	1.171	0.902	-20.39	14.34
	(22.69)	(3.866)	(5.240)	(15.36)	(38.68)
REIT x Distance to Default	3.871	0.251	-0.847	-0.886	-8.570
	(4.781)	(0.858)	(0.988)	(2.667)	(9.059)
REIT x Secured facility	18.14	-7.310**	-15.87***	-7.566	-22.72
	(18.45)	(3.630)	(5.657)	(15.43)	(53.67)
REIT x All As	11.08	1.871	1.096	4.741	4.144
	(18.23)	(4.136)	(6.316)	(20.93)	(103.0)
REIT x BBB	-22.33	-2.170	-8.468	-2.228	47.75
	(15.25)	(3.440)	(5.363)	(11.46)	(39.19)
REIT x NonIG	4.714	3.910	4.070	22.04	51.80
	(23.67)	(5.088)	(6.317)	(19.19)	(50.06)
Constant	224.6***	31.62***	15.48***	167.5***	324.1***
	(11.05)	(2.472)	(2.250)	(10.54)	(23.69)
Credit Line	Y	Y	Y	Y	N
Rating Group FE	Y	Y	Y	Y	Y
Lender x Year-Quarter FE	Y	Y	Y	Y	Y
Obs.	9,035	7,525	9,738	7,022	4,436
R^2	0.607	0.611	0.484	0.648	0.585

Table 10: Incremental SRISK for US banks due to REIT Credit Line Exposure as of 2023Q4

The table presents results of applying our incremental SRISK methodology described in Equations 8 and 9. Panel A reports the estimated parameters we use as inputs for the incremental SRISK calculations. For $E[Utilization^k|Crisis]$ we estimate a quarterly regression for the respective firm type of the utilization rate on the S&P 500 return and predict the fitted value for a 40% market downturn. For γ^k we use the results from Table A4. Panel B shows the results for treating all borrowers equally in calculating the stress scenario. Panel C shows the results where we consider REITs as a separate group of borrowers with different drawdown properties. Panel D indicates the percentage increase from the baseline SRISK when considering the credit line business without borrower heterogeneity in the first column, with borrower heterogeneity in the second column, and the increase in the incremental values between borrower heterogeneity and no heterogeneity in the third column. Panel E compares the impact on the market valuation of banks from considering the credit line business without heterogeneity, the incremental effect of considering REITs as a separate borrower class, and the incremental effect of considering on-balance sheet CRE loans. Large banks refers to the sum of the impact on the banks in our sample classified as large and, respectively, classified as regional for Regional banks. Numbers are in USD billion unless stated otherwise. The calculations are using inputs as of 2023Q4.

Panel A – Estimated parameters

$E[Utilization^{REIT}\|Crisis]$	$E[Utilization^{Non-REIT}\|Crisis]$	γ^{REIT}	$\gamma^{Non-REIT}$
0.451	0.308	9.18	8.50
$E[Utilization^{All}\|Crisis]$		γ^{All}	γ^{CRE}
0.316		8.88	0.62

Panel B – No heterogeneity in borrowers

Bank (Group)	$\text{SRISK}^{Baseline}$	SRISK^{LRMES}	SRISK^{CL}	$\text{SRISK}^{LRMES+CL}$
JPMORGAN CHASE & CO.	30.8	24.5	8.1	32.6
BANK OF AMERICA CORPORATION	121.0	18.9	9.5	28.4
WELLS FARGO & COMPANY	53.1	16.9	7.7	24.6
GOLDMAN SACHS GROUP, INC., THE	66.5	5.6	3.1	8.7
MORGAN STANLEY	31.6	6.6	2.2	8.8
All banks (N = 47)	624.8	125.1	55.1	180.2
Large banks (N = 21)	598.9	115.6	51.9	167.5
Regional banks (N = 26)	25.9	9.6	3.2	12.7

Panel C – Reflecting REIT vs non-REIT borrowers

Bank (Group)	$SRISK^{Baseline}$	$SRISK^{LRMES}$	$SRISK^{CL}$	$SRISK^{LRMES+CL}$
JPMORGAN CHASE & CO.	30.8	29.5	8.1	37.6
BANK OF AMERICA CORPORATION	121.0	23.1	9.5	32.5
WELLS FARGO & COMPANY	53.1	21.0	7.7	28.7
GOLDMAN SACHS GROUP, INC., THE	66.5	6.8	3.1	9.8
MORGAN STANLEY	31.6	8.7	2.2	10.9
All banks (N = 47)	624.8	160.8	55.7	216.5
Large banks (N = 21)	598.9	144.9	52.3	197.2
Regional banks (N = 26)	25.9	15.9	3.4	19.3

Panel D – Comparison to CRE Exposure (absolute values)

Bank (Group)	$SRISK^{Baseline}$	$SRISK^{LRMES}$ No Heterogeneity	$SRISK^{LRMES}$ REIT Heterogeneity	$SRISK^{LRMES}$ CRE Exposure
JPMORGAN CHASE & CO.	30.8	24.5	29.5	0.4
BANK OF AMERICA CORPORATION	121.0	18.9	23.1	0.2
WELLS FARGO & COMPANY	53.1	16.9	21.0	0.3
GOLDMAN SACHS GROUP, INC., THE	66.5	5.6	6.8	0.0
MORGAN STANLEY	31.6	6.6	8.7	0.0
All banks (N = 47)	624.8	125.1	160.8	2.3
Large banks (N = 21)	598.9	115.6	144.9	1.7
Regional banks (N = 26)	25.9	9.6	15.9	0.6

Panel E – Comparison to CRE Exposure (in % of baseline SRISK)

Bank (Group)	$SRISK^{Baseline}$	$SRISK^{LRMES}$ No Heterogeneity	$SRISK^{LRMES}$ REIT Heterogeneity	$SRISK^{LRMES}$ CRE Exposure
JPMORGAN CHASE & CO.	30.8	79.6	95.7	1.4
BANK OF AMERICA CORPORATION	121.0	15.7	19.1	0.1
WELLS FARGO & COMPANY	53.1	31.9	39.5	0.5
GOLDMAN SACHS GROUP, INC., THE	66.5	8.4	10.2	0.0
MORGAN STANLEY	31.6	21.0	27.4	0.1
All banks (N = 47)	624.8	20.0	25.7	0.4
Large banks (N = 21)	598.9	19.3	24.2	0.3
Regional banks (N = 26)	25.9	36.9	61.4	2.4

A Additional Tables and Figures

Figure A1: Banks' total exposure to CRE - 2023 Q4

Panel A of this figure plots the total exposure of the largest 25 banks in the US to the CRE market split into three categories: their direct on-balance sheet CRE exposure, their term loans to REITs and their credit lines to REITs. Panel B then displays the share of the term loan and credit line exposure to REITs in the total CRE market exposure.

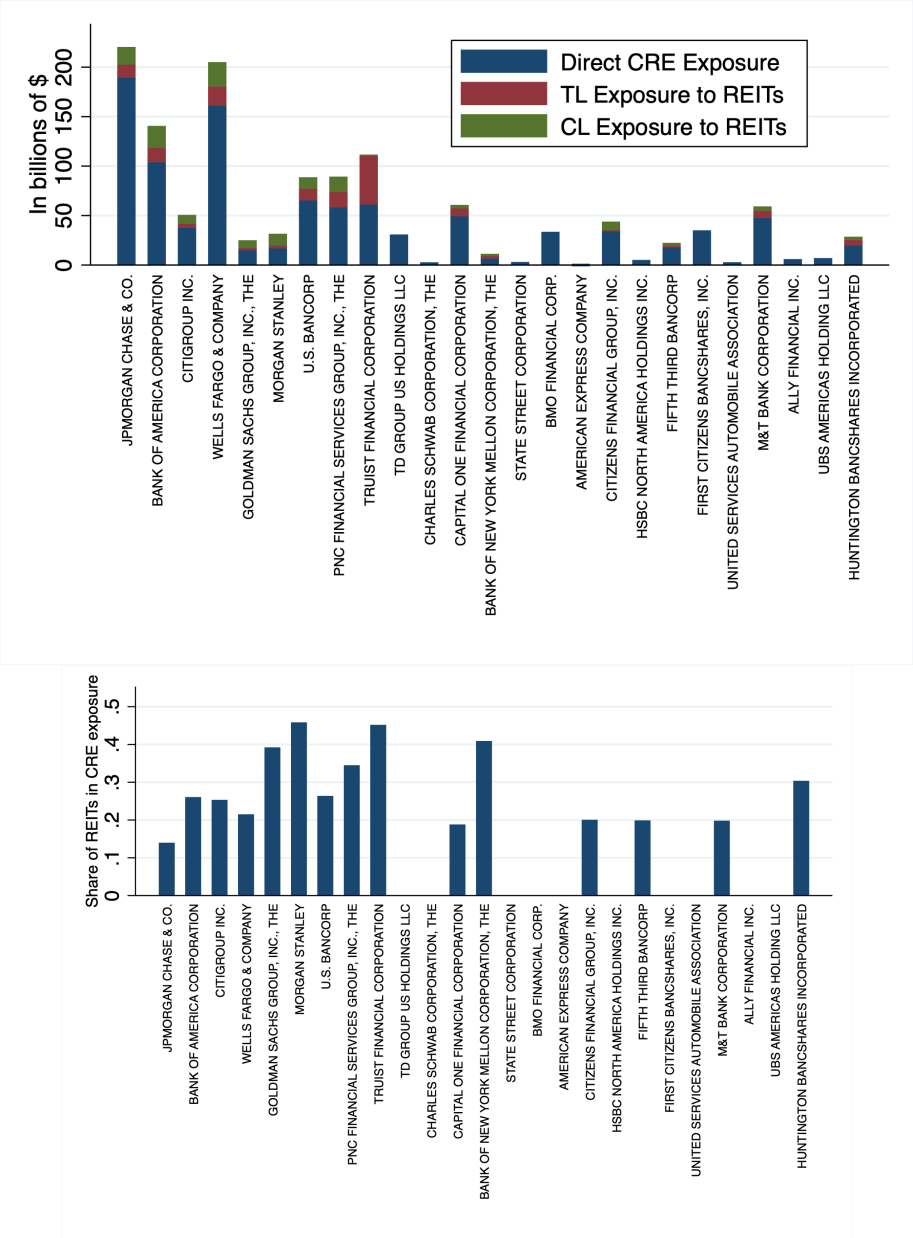


Figure A2: SRISK comparison bank-by-bank

This figure shows comparisons between the market revaluation effect from the SRISK exercise for three scenarios: considering credit line commitments without heterogeneity, considering credit line commitments with REIT heterogeneity, and considering CRE exposure. The banks are ordered by their market value as of 2023Q4.

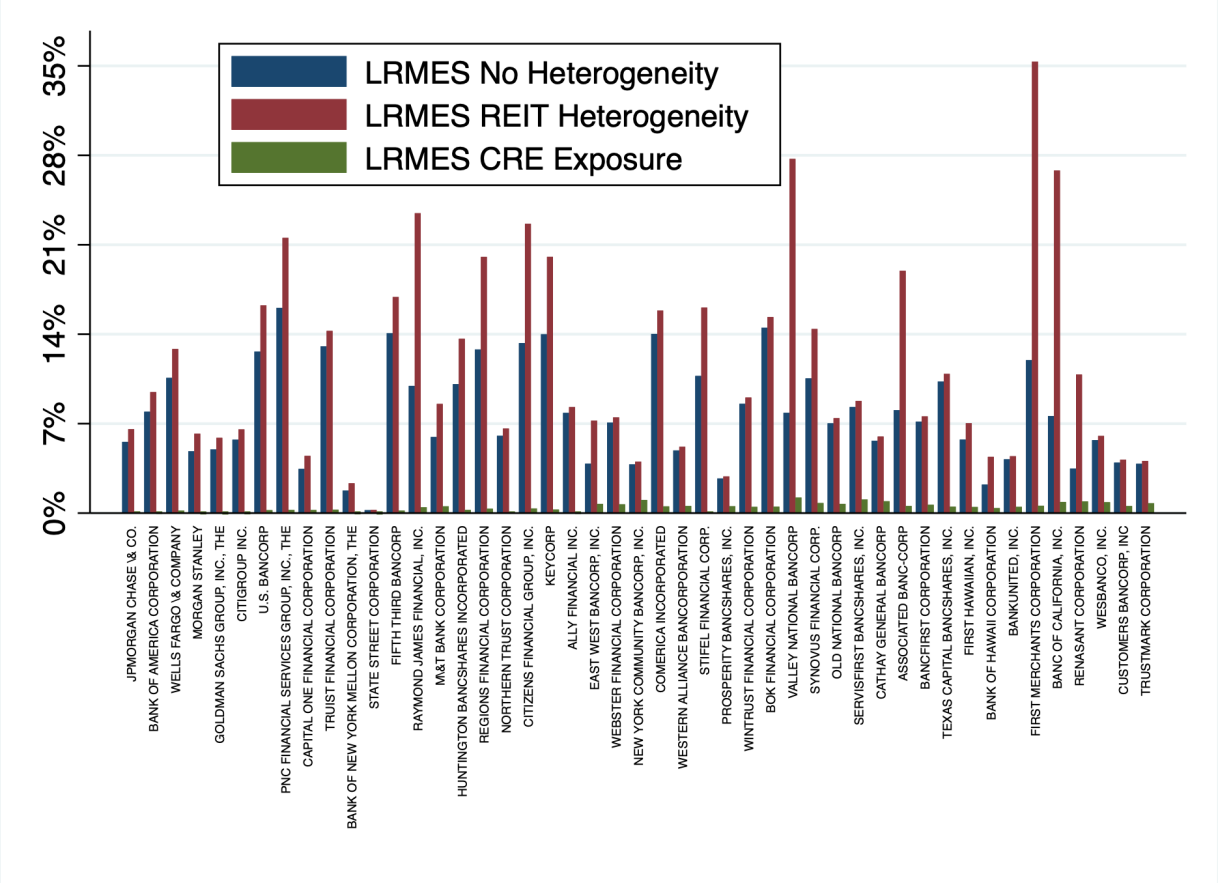


Table A1: Variable Definitions

Name	Definition	Source
S&P 500 Return	Quarterly change in the S&P 500 price with quarterly price calculated as closing price for S&P 500 in that quarter	CRSP
VIX	CBOE Volatility Index averaged over the quarter	FRED
Sub-sector Return	Calculated for each borrower as the weighted average quarterly return of firms in their sub-sector excluding the borrower itself. Sub-sectors are defined as the same 2-digit SIC code for non-REITs. REITs are classified into 9 sub-sectors - Mortgage REITs (mREITs), Health Care, Industrial, Lodging/Resorts, Office, Residential, Retail, Diversified, or Commercial- Other, where Commercial-Other includes REITs in Self Storage, Specialty, Telecommunications, Timberland, Data Centers, Gaming, and Infrastructure	CRSP + Nareit
EBP	Excess Bond Premium à la Gilchrist and Zakrajšek (2012)	Fed
ELP	Excess Loan Premium à la Saunders et al. (Forthcoming)	Authors
CP spread	Spread between 3-Month AA Financial Commercial Paper and Effective Federal Funds Rate	FRED
GFC	Takes a value of 1 between 2007Q2 and 2009Q2	-
COVID-19	Takes a value of 1 in 2020Q1	-
REIT Index	FTSE Nareit U.S. Real Estate Index Series	Nareit
Quarterly bank stock return	Quarterly change in the bank stock price with quarterly price calculated as the closing stock price in that quarter	CRSP
REIT Subsector shock	Calculated at the bank-level as the weighted average of sub-sector returns of borrowers in the bank's portfolio weighted by the total outstanding credit line commitment from the bank to the borrower in a given quarter	CRSP + DealScan

Table A1: Variable Definitions

Name	Definition	Source
Debt/Equity	Long-term debt plus debt in current liabilities divided by stockholders' equity: $\frac{dlttq+dlcq}{seqq}$	Compustat
Credit Line/Assets	Total credit line balance divided by total assets: $\frac{outstandingbalrrevolvingcredit}{atq}$	Capital IQ + Compustat
Liquidity/Assets	Cash and short-term investments minus debt in current liabilities divided by total assets: $\frac{cheq-dclq}{atq}$	Compustat
Short Term Debt Ratio	Debt in current liabilities divided by long-term debt plus debt in current liabilities: $\frac{dclq}{dclq+dlttq}$	Compustat
Debt Issuance/Assets	Long-term debt issuance divided by total assets: $\frac{dltisy}{atq}$	Compustat
Rating Group	Group classification based on local currency long-term issuer rating. Group is "All As" if the rating is between AAA and A, group is "BBB" if the rating is BBB, group is "non-IG" for all ratings below BBB, and group is "unrated" for missing ratings.	Standard & Poors
Utilization or Utilization Rate	One minus undrawn credit line balance divided by total credit line balance: 1-$\frac{undrawncrdtportionrevolvingcrdt}{outstandingbalrrevolvingcredit}$. We fill missing Q1 to Q3 values in one calendar year with Q4 values or missing Q1 values with Q2 values and missing Q3 values with Q4 values if available.	Capital IQ
Δ Drawn CL Volume	Log difference of drawn credit line balance between quarters t and $t-1$	Capital IQ
Firm Beta	Coefficient from a firm-level monthly regression of firm log-stock return onto the log-S&P 500 return using data from 1990M1 to 2022M12	CRSP
Distance to Default	Applying the Bharath and Shumway (2008) methodology to quarterly data	Compustat
Shares redeemed	Negative log-difference in common shares outstanding between quarters t and $t-1$: -(log($cshoq_{i,t}$) - log($cshoq_{i,t-1}$))	Compustat
Δ Shareholder Equity	Log-difference in stockholders' equity between quarters t and $t-1$: log($teqq_{i,t}$) - log($teqq_{i,t-1}$)	Compustat

Table A1: Variable Definitions

Name	Definition	Source
Δ Shareholder Equity (Modified)	Log-difference in stockholders' equity minus retained earnings between quarters t and $t-1$: $\log(teqq_{i,t} - req_{i,t})$ - $\log(teqq_{i,t-1} - req_{i,t-1})$	Compustat
Δ Market Value	Log-difference in market value between quarters t and $t-1$: $\log(mkvaltq_{i,t})$ - $\log(mkvaltq_{i,t-1})$	Compustat
Δ Stock Price	Log-difference in stock price between quarters t and $t-1$: $\log(prccq_{i,t})$ - $\log(prccq_{i,t-1})$	Compustat
REIT	Takes a value of 1 if the SIC code of the firm is 6798	Compustat
NBFI Ex-REIT	Takes a value of 1 if the SIC code of the firm is between 6000 and 7000 and the firm is not a REIT and not a bank (SIC codes between 6000 and 6100)	Compustat
Non-financial	Any firm for who REIT and NBFI Ex-REIT are 0	Compustat
Large bank	A bank whose total assets exceed USD 250 (100) billion depending on whether the Super-Regional category is present (or not) in the Figure/Table	Call Reports
Super-Regional bank	A bank whose total assets exceed USD 100 billion but are below USD 250 billion	Call Reports
Regional bank	A bank whose total assets exceed USD 10 billion but are below USD 100 billion	Call Reports
Community bank	A bank whose total assets are below USD 10 billion	Call Reports
CRE Exposure	The construction of this variable is discussed in detail in Section 3.3	Call Reports
CRE Exposure/Equity	CRE Exposure divided by total equity: $\frac{CRE\ Exposure}{bhck3210}$	Call Reports
Loan Size (mil.)	Size of loan facility in millions of dollars [*tranche_amount*]	DealScan
Drawn spreads / AISD	Spread on term loans or the drawn portion of credit lines - sum of spread plus facility fee (annual fee paid on the entire committed amount) [*all_in_spread_drawn_bps*]	DealScan
Undrawn spreads / AISU	Spread on the undrawn portion of credit lines - sum of commitment fee plus facility fee [*all_in_spread_drawn_bps*]	DealScan

Table A1: Variable Definitions

Name	Definition	Source
Commitment Fee	The fee paid by borrowers on unused loan commitments [*commitment_fee_bps*]	DealScan
TCB	Total Cost of Borrowing accounting for spreads and fees as per Berg et al. (2016)	DealScan + author calculations
Maturity (months)	Maturity of the loan at origination in months [*tenor_maturity*]	DealScan
Financial Covenants	Takes a value of one if one of the following financial covenants are part of the loan contract - leverage ratio, debt to cash flow, senior debt to cash flow, tangible net worth, net worth, fixed charge coverage ratio, debt service coverage ratio, interest coverage ratio, cash interest coverage ratio, debt to tangible net worth ratio, debt to equity ratio, current ratio, max. loan to value ratio [*all_covenants_financial=1*]	DealScan
General Covenants	Takes a value of one if one of the following general covenants are part of the loan contract - excess cash flow sweep, asset sales sweep, material restrictions, debt issue sweep, equity issue sweep, insurance proceeds sweep [*all_covenants_general=1*]	DealScan
SOFR-linked	Takes a value of one if the spread is tied to SOFR [*base_reference_rate =Term SOFR*]	DealScan
Secured facility	Takes a value of one for secured loans [*secured=1*]	DealScan
Total CL Balance	Total balance on credit lines (sum of drawn and undrawn portion) outstanding for the borrower [Sum of *tranche_amount* if *tranche_type* = Limited Line, Revolver/Line < 1 Yr., Revolver/Line >= 1 Yr., 364-Day Facility, Standby Letter of Credit]	DealScan
Overall Commitments	Sum of off-balance sheet commitments in the C&I market (*bhckj457*) and to other financial institutions (*bhckj458*)	Call Reports

Table A1: Variable Definitions

Name	Definition	Source
REIT CL Exposure	The construction of this variable is discussed in detail in Section 3.3	DealScan + Call Reports
Non-REIT CL Exposure	Overall Commitments minus REIT CL Exposure	DealScan + Call Reports
REIT TL Exposure	The construction of this variable is discussed in detail in Section 3.3	DealScan + Call Reports

Table A2: Differential credit line utilization of REITs as a function of stock returns

The table presents results on the impact of market conditions on borrower credit line utilization. The sample period is 2005Q1 to 2023Q4. In Column (1), we analyze the sensitivity of credit line drawdowns to stock market performance (S&P 500). In Column (2), we separate the impact of positive and negative market perfomance on credit line utilization. In Column (3), we analyze the sensitivity of credit line utilization to market volatility (VIX). In Column (4), we analyze the sensitivity of credit line utilization in crisis times. *Crisis* is an indicator that takes a value of one during the GFC (2007Q3-2009Q2) and COVID-19 (2020Q1). In Column (5), we analyze credit line utilization to a borrower's industry performance (sub-sector return) calculated after excluding the borrower from the calculations of industry performance. Sub-sector return is measured as a weighted average of quarterly stock returns for firms in the same 2-digit SIC code for non-REITs and REIT-sub group classification for REITs. For REITs, sub-sector return is based on REIT classification into one of 9 sub-groups - Health Care, Industrial, Lodging/Resorts, Mortgage, Office, Residential, Retail, Diversified, or Commercial- Other. We then look at the impact of own industry conditions on borrower utilization. In column (6), (7) and (8), we include measures of aggregate credit conditions as measured by the Excess Bond Premium (EBP, see Gilchrist and Zakrajšek (2012)) and Excess Loan Premium (ELP, see Saunders et al. (Forthcoming)) and average spreads on commercial paper. *REIT* takes a value of one for REITs and zero for all other financial and non-financial firms. *NBFI Ex-REIT* takes a value of one for NBFIs excluding REITs, and zero otherwise. All variables are standardized to have a mean of 0 and standard deviation of 1. We add the logarithm of total assets, the level of liquid assets over total assets, firm leverage (debt to equity), short term debt over total debt ratio, and debt issuance over total assets as control variables in all columns. Standard errors are clustered at the borrower level.

	Utilization Rate (%)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
REIT	5.431***	4.552***	5.467***	4.889***	4.599***	5.577***	5.869***	5.374***
	(1.417)	(1.509)	(1.417)	(1.514)	(1.666)	(1.413)	(1.460)	(1.420)
REIT x S&P 500 return	-2.153***							
	(0.505)							
NBFI Ex-REIT	6.670***	7.148***	6.668***	7.069***	8.039***	6.647***	6.727***	6.808***
	(0.950)	(1.051)	(0.950)	(0.982)	(1.100)	(0.953)	(0.979)	(0.954)
NBFI Ex-REIT x S&P 500 return	0.531**							
	(0.253)							
REIT x Positive S&P 500 return		-0.440						
		(1.221)						
REIT x Negative S&P 500 return		-2.997***						
		(0.789)						
NBFI Ex-REIT x Positive S&P 500 return		-0.358						
		(0.742)						
NBFI Ex-REIT x Negative S&P 500 return		1.001*						
		(0.516)						
REIT x VIX			1.882***					
			(0.713)					
NBFI Ex-REIT x VIX			-0.524					
			(0.482)					
REIT x Crisis				4.802**				
				(2.346)				
NBFI Ex-REIT x Crisis				-3.443**				
				(1.593)				
REIT x Sub-sector return					-2.827***			
					(0.881)			
NBFI Ex-REIT x Sub-sector return					0.455			
					(0.442)			
REIT x EBP						0.895		
						(0.649)		
NBFI Ex-REIT x EBP						-0.232		
						(0.481)		
REIT x ELP							1.134	
							(0.910)	
NBFI Ex-REIT x ELP							0.341	
							(0.657)	
REIT x CP Spread								0.888
								(0.789)
NBFI Ex-REIT x CP Spread								-0.661*
								(0.387)
$\text{roa}_l ag$								0.848
								(2.953)
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Rating Group FE	Y	Y	Y	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y
Obs.	174,881	174,881	174,881	174,881	115,575	174,881	161,706	174,686
R^2	0.199	0.199	0.199	0.199	0.196	0.199	0.196	0.199

Table A3: Effect of equity erosion on REIT drawdowns

This table shows results of regressing the log change in the drawn credit line volume for each REIT on changes in REIT equity value. In Column (1), we measure the log change in its shareholder equity. In Column (2), we measure the log change in its shareholder equity, after correcting this change for retained earnings – reflecting erosion in equity value or stock repurchases by the issuer. In Column (3), we measure the log change in its market value. In Column (4), we measure the log change in its market price. Column (5) features both shareholder equity from Column (1) and market value from Column (3) simultaneously. The sample period is 2005Q1 to 2023Q4. We include the logarithm of total assets, firm leverage (total debt to equity), the level of cash over total assets, the ratio of short-term debt to total debt, and the size of quarterly debt issuance over total assets as control variables. Control variables are standardized to have a mean of 0 and standard deviation of 1. Standard errors are clustered at the REIT-level.

	Δ Drawn CL Volume				
	(1)	(2)	(3)	(4)	(5)
Δ Shareholder Equity	-0.467**				-0.496**
	(0.207)				(0.237)
Δ Shareholder Equity (modified)		-0.237***			
		(0.084)			
Δ Market Value			-0.137**		-0.071
			(0.062)		(0.078)
Δ Stock Price				-0.089	
				(0.078)	
Log(Assets in mil.)	0.013	-0.098	0.067	0.056	0.032
	(0.108)	(0.116)	(0.105)	(0.095)	(0.132)
Liquidity/Assets	-0.258***	-0.232**	-0.118*	-0.126*	-0.214*
	(0.098)	(0.099)	(0.070)	(0.070)	(0.115)
Debt/Equity	-0.031	0.028	-0.013	-0.013	-0.029
	(0.029)	(0.036)	(0.018)	(0.017)	(0.032)
Short Term Debt Ratio	-0.086	-0.075	-0.040	-0.038	-0.070
	(0.058)	(0.059)	(0.057)	(0.057)	(0.068)
Debt Issuance/Assets	0.004	-0.003	-0.009	-0.010	-0.004
	(0.020)	(0.019)	(0.016)	(0.015)	(0.020)
REIT FE	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y
Obs.	2,469	2,420	2,682	2,875	2,231
R^2	0.130	0.128	0.112	0.110	0.131

Table A4: Effect of REIT Exposure on Bank Stock Returns - S&P 500 version

This table serves as the input for the SRISK results in Table 10 and Figure 9 and shows results of regressing bank stock returns on bank credit line commitment levels scaled by total assets as well as on the return of the S&P 500. The sample period is 2005Q1 to 2023Q4. Column (2) adds the on-balance sheet exposure to CRE scaled by total assets. Column (3) replaces the overall credit line commitments by REIT credit line commitments scaled by total assets. Column (4) replaces REIT credit line commitments by non-REIT credit line commitments scaled by total assets. All these terms are added jointly with an interaction with the return of the S&P 500. All columns employ a set of controls close to the setup in Acharya et al. (2024b) and the Fama-French 3-factor model. All continuous variables are standardized to have a mean of 0 and a standard deviation of 1. Standard errors are clustered at the bank-level.

	Quarterly bank stock returns (%)			
	(1)	(2)	(3)	(4)
Overall Commitments (std.)	-0.471***	-0.525**		
	(0.121)	(0.208)		
Overall Commitments (std.) x S&P 500 return	8.877***	8.754***		
	(1.399)	(1.889)		
CRE Exposure (std.)		-0.641***		
		(0.215)		
CRE Exposure (std.) x S&P 500 return		-0.561		
		(2.948)		
REIT CL Exposure (std.)			-0.367***	
			(0.110)	
REIT CL Exposure (std.) x S&P 500 return			9.176***	
			(1.539)	
Non-REIT CL Exposure (std.)				-0.460**
				(0.221)
Non-REIT CL Exposure (std.) x S&P 500 return				8.496***
				(1.777)
Constant	-13.27***	-14.23***	-12.79***	-13.16***
	(2.652)	(3.143)	(2.693)	(3.206)
Controls	Y	Y	Y	Y
Bank FE	N	N	N	N
Time FE	N	N	N	N
Obs.	8,983	8,983	8,983	8,983
R^2	0.489	0.489	0.488	0.489

Table A5: Regulatory treatment of various exposures

This table summarizes the treatment of bank exposure to various borrower types under the Basel III regime. TL refers to term loan, CL refers to credit line. The entries in the credit risk columns specify the treatment of the respective exposure type when calculating regulatory risk weights for, e.g., risk-weighted capitalization ratios. The entries in the liquidity risk column specify the treatment of the respective exposure type – committed through a credit line – when calculating the liquidity coverage ratio. Default rates taken from https://www.spglobal.com/ratings/en/research/articles/240624-default-transition-and-recovery-2023-annual-global-financial-services-default-and-rating-transition-study-13137806.

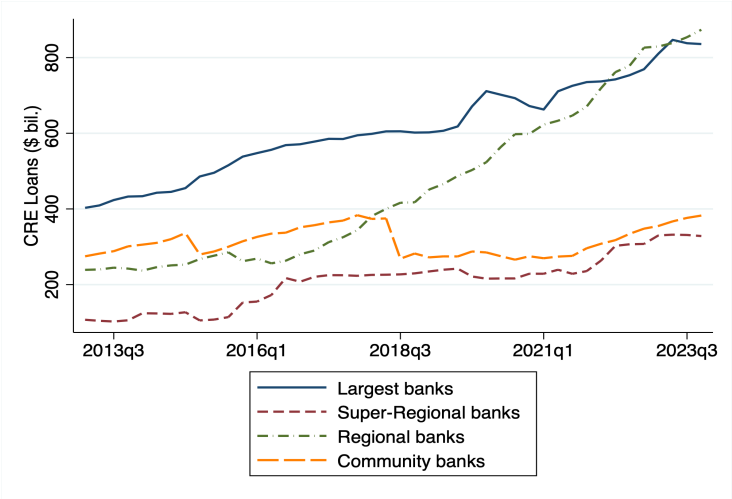
Borrower type	Credit risk TL	Credit risk CL	Liquidity risk
REIT	"IRBA: Banks calculate own risk weight, NBFIs historically low default rates (1.03%) SA: CRE 20.43. Risk weight 75% for BBB"	"Credit Conversion Factor 20% for maturity less than one year. Credit Conversion Factor 50% for maturity of more than one year."	40% outflow assumption
Financial	"IRBA: Banks calculate own risk weight, NBFIs historically low default rates (1.03%) SA: CRE 20.18. Risk weight 50% for BBB"	"Credit Conversion Factor 20% for maturity less than one year. Credit Conversion Factor 50% for maturity of more than one year."	40% outflow assumption
Non-financial	"IRBA: Banks calculate own risk weight, NFC historically higher default rates (1.94%) SA: CRE 20.43. Risk weight 75% for BBB"	"Credit Conversion Factor 20% for maturity less than one year. Credit Conversion Factor 50% for maturity of more than one year."	10% outflow assumption
CRE loans	"IRBA: Banks calculate own risk weight SA: CRE 20.87. Risk weight LTV-dependent with 90% for medium LTV"	"Credit Conversion Factor 20% for maturity less than one year. Credit Conversion Factor 50% for maturity of more than one year."	10% outflow assumption

Online Appendix

Figure OA.1: Commercial Real Estate (CRE) loans by bank type

This figure shows the total reported on-balance sheet exposure to the commercial real estate market (CRE, Panel A) and CRE exposure scaled by the total book value of equity of the bank (Panel B). Data is from the FR Y-C (FDIC Call Reports) at the quarterly frequency from 2013Q1 to 2023Q4. Banks are classified as follows: community banks (assets $<$ \$10 billion), regional banks (assets between \$10 and \$100 billion), super-regional banks (assets between \$100 billion and \$250 billion), and largest banks (assets greater than \$250 billion).

Panel A - Total CRE Exposure - by bank size



Panel B - CRE Exposure Scaled By Equity - by bank size

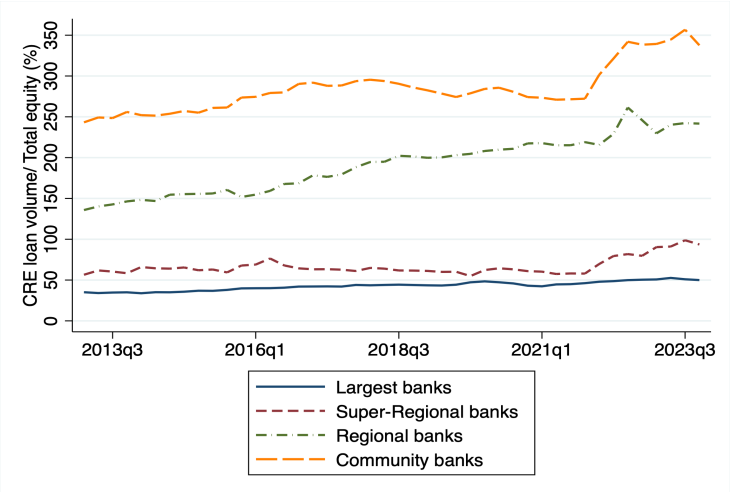


Figure OA.2: Banks' Exposure to Commercial Real Estate (CRE) by bank type

This figure shows the total exposure of banks to commercial real estate (CRE) by stacking their direct exposure through on-balance sheet CRE loans and indirect exposure through banks' term loans and credit lines to Real Estate Investment Trusts (REITs). Banks are classified as follows: community banks (assets < $10 billion), regional banks (assets between $10 and $100 billion), super-regional banks (assets between $100 billion and $250 billion), and largest banks (assets greater than $250 billion). Data is from DealScan, FR-Y9C filings, and Capital IQ. Data as of 2023Q4

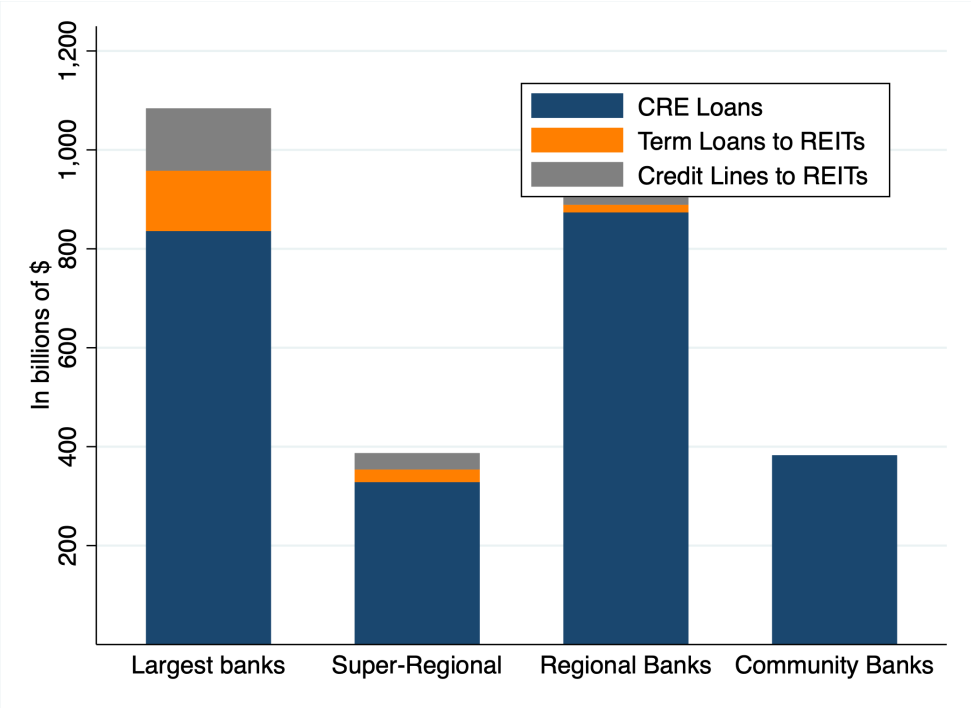


Figure OA.3: Banks' Exposure to Commercial Real Estate (CRE) by bank type

This figure shows the total exposure of banks to commercial real estate (CRE) including their direct exposure through on-balance sheet CRE loans and indirect exposure through banks' term loans and credit lines to Real Estate Investment Trusts (REITs). Banks are classified as follows: community banks (assets < $10 billion), regional banks (assets between $10 and $100 billion), super-regional banks (assets between $100 billion and $250 billion), and largest banks (assets greater than $250 billion). In Panel B, we document the direct CRE exposure as well as total CRE exposure (direct CRE + REIT CL and TL exposure) for large banks. Data is from DealScan, FR-Y9C filings, and Capital IQ.

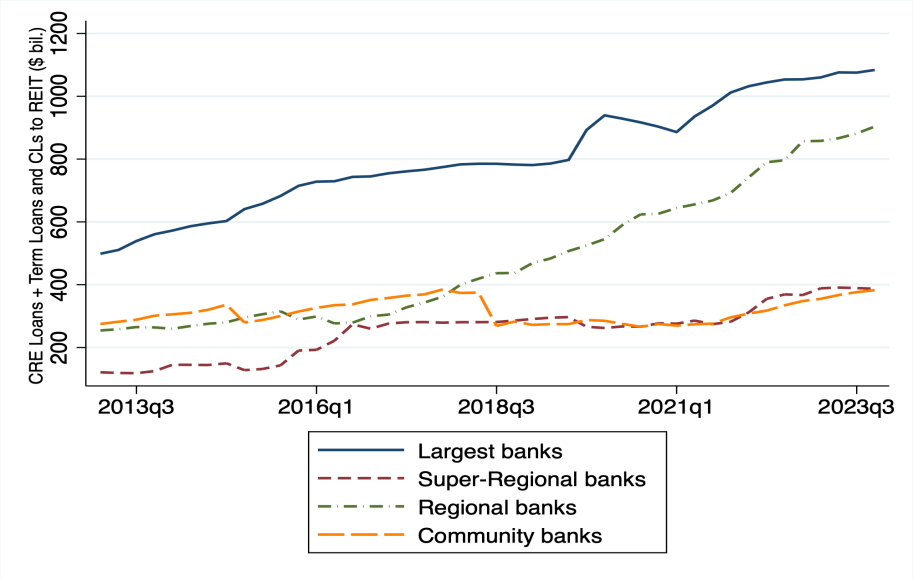
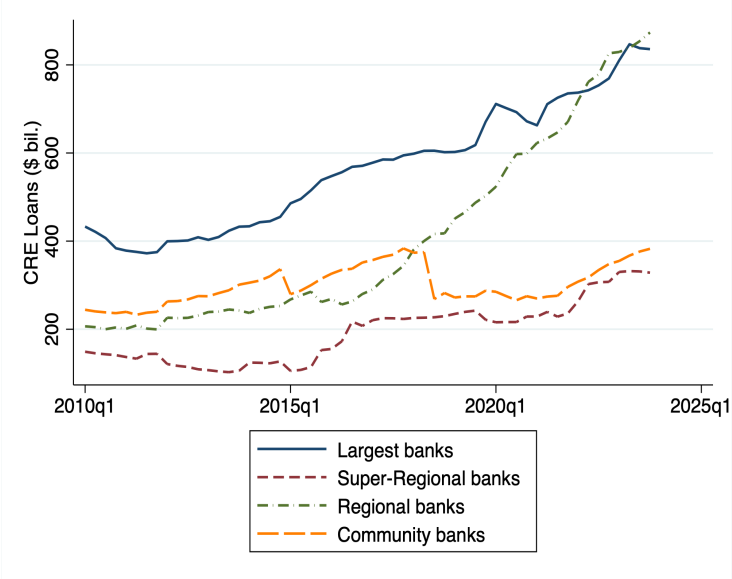


Figure OA.4: Commercial Real Estate (CRE) loans by bank type

This figure shows the total reported on-balance sheet exposure to the commercial real estate market (CRE, Panel A) and CRE exposure scaled by the total book value of equity of the bank (Panel B). Data is from the FR Y-C (FDIC Call Reports) at the quarterly frequency from 2010Q1 to 2023Q4. Banks are classified as follows: community banks (assets $<$ \$10 billion), regional banks (assets between \$10 and \$100 billion), super-regional banks (assets between \$100 billion and \$250 billion), and largest banks (assets greater than \$250 billion).

Panel A - Total CRE Exposure - by bank size



Panel B - CRE Exposure Scaled By Equity - by bank size

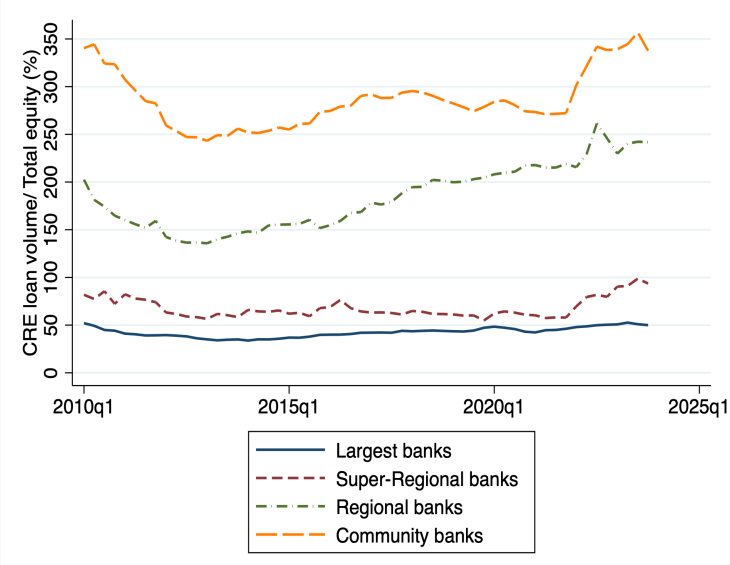


Figure OA.5: Banks' Term Loan and Credit Line Exposure to REITs - Scaled by Equity

This figure plots the combined term loan and credit line exposure of banks to REITs scaled by the total equity of the bank. Data is from the FR Y-C at the quarterly frequency from 2013Q1 to 2023Q4. Banks are classified as follows: community banks (assets < $10 billion), regional banks (assets between $10 and $100 billion), super-regional banks (assets between $100 billion and $250 billion), and largest banks (assets greater than $250 billion).

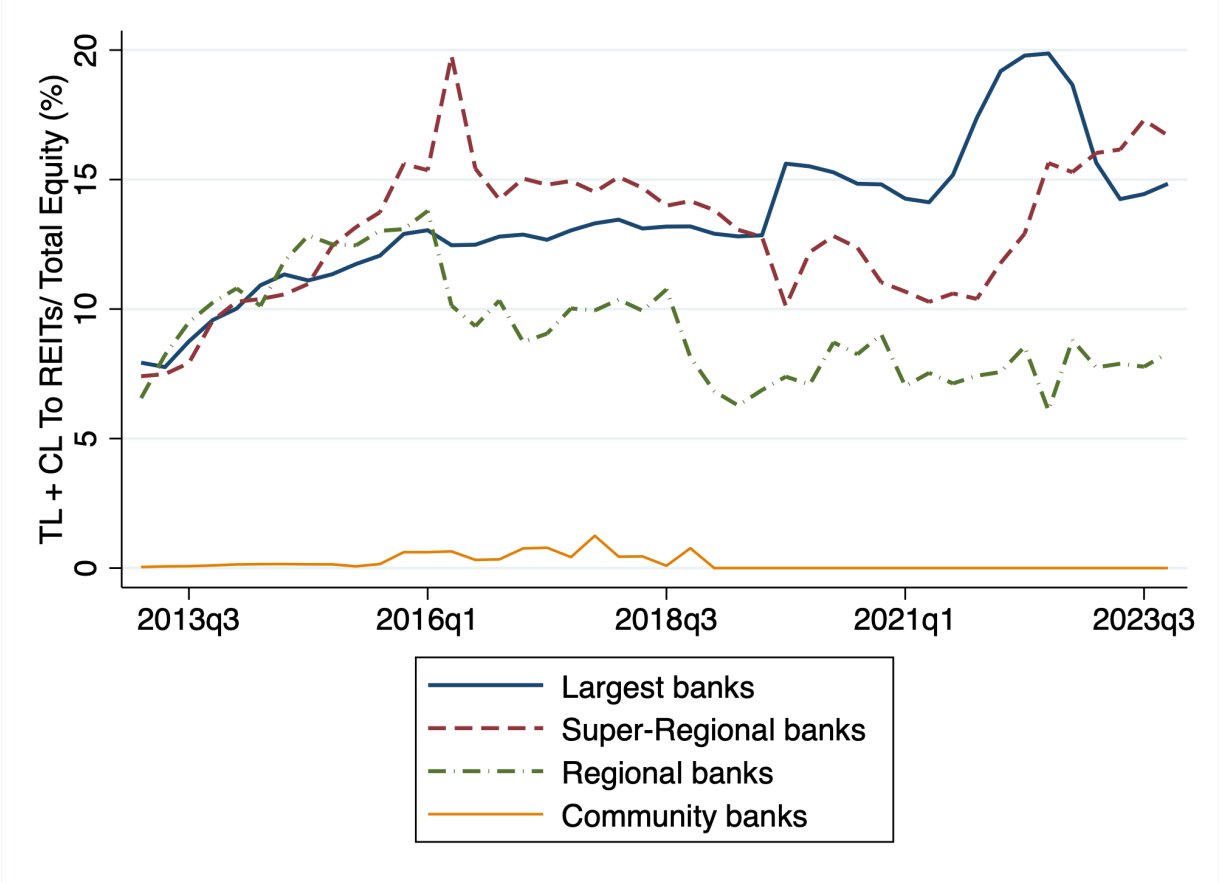
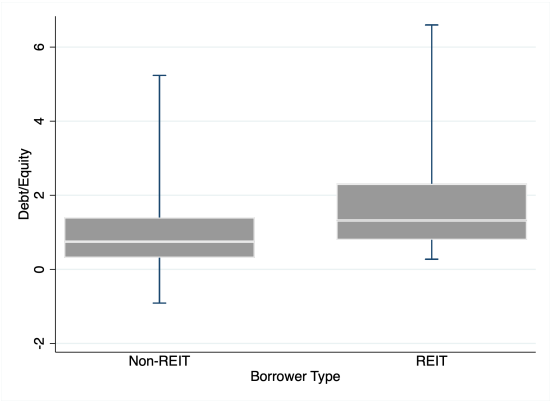
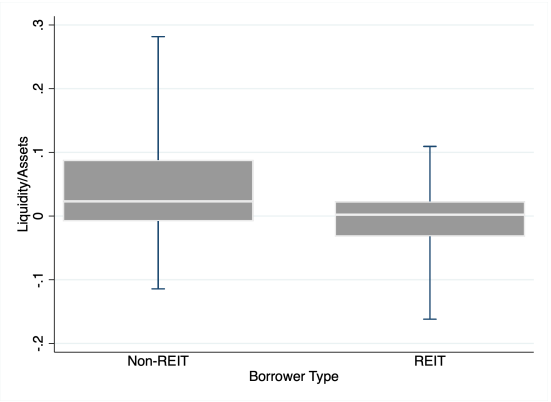


Figure OA.6: Comparing REITs to non-REITs

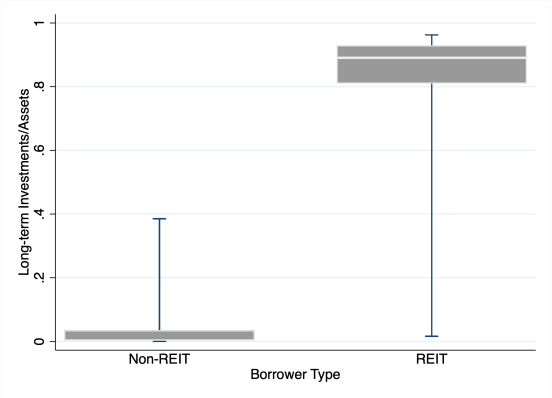
This figure compares the distribution of REIT and non-REIT financial characteristics. The box plots the 25th, median, and 75th percentile, while the caps denote the 5th and 95th percentile of the distribution. The distribution is based on the full sample between 2005 and 2023 and data is from Capital IQ and Compustat.



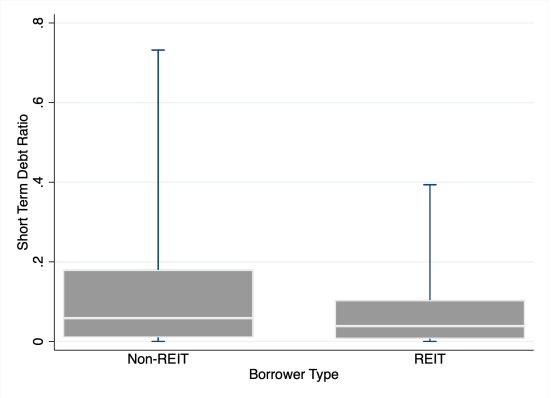
(a) Leverage



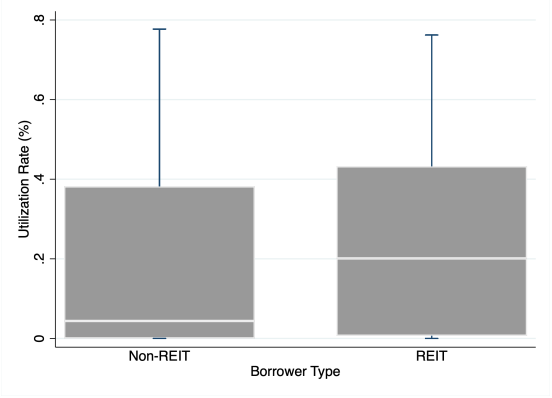
(b) Liquidity to Assets



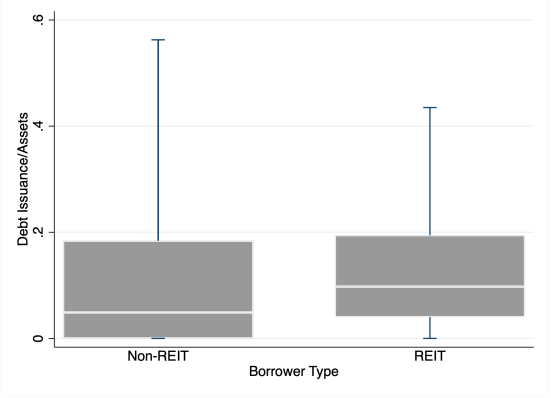
(c) Long-term Investments to Assets



(d) Short-term debt to Total Debt



(e) Credit Line Utilization Rate

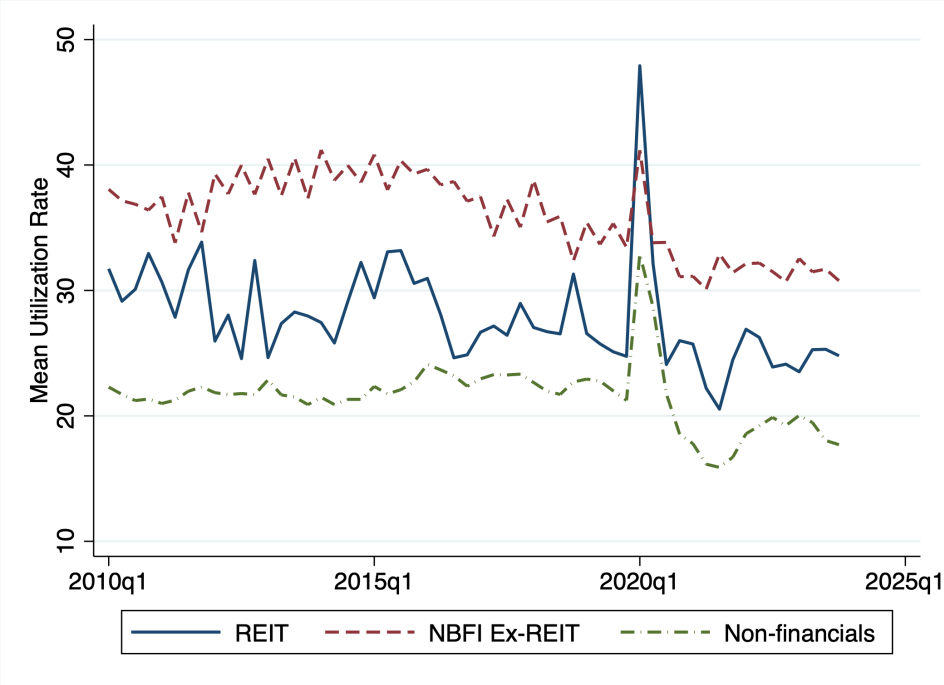


(f) Long-term Debt Issuance to Assets

Figure OA.7: Credit line utilization rates by borrower category

This figure plots the equal-weighted (Panel A) and median (Panel B) credit line utilization rate by borrowers in each quarter. We define the utilization rate as the drawn portion of total credit line commitments and plot the median utilization rates. We separate borrowers into three groups - REITs, NBFIs excluding REITs, and non-financial firms. Data is from 2010Q1 to 2023Q4 and is obtained from Capital IQ.

Panel A - Equal-weighted average



Panel B - Median

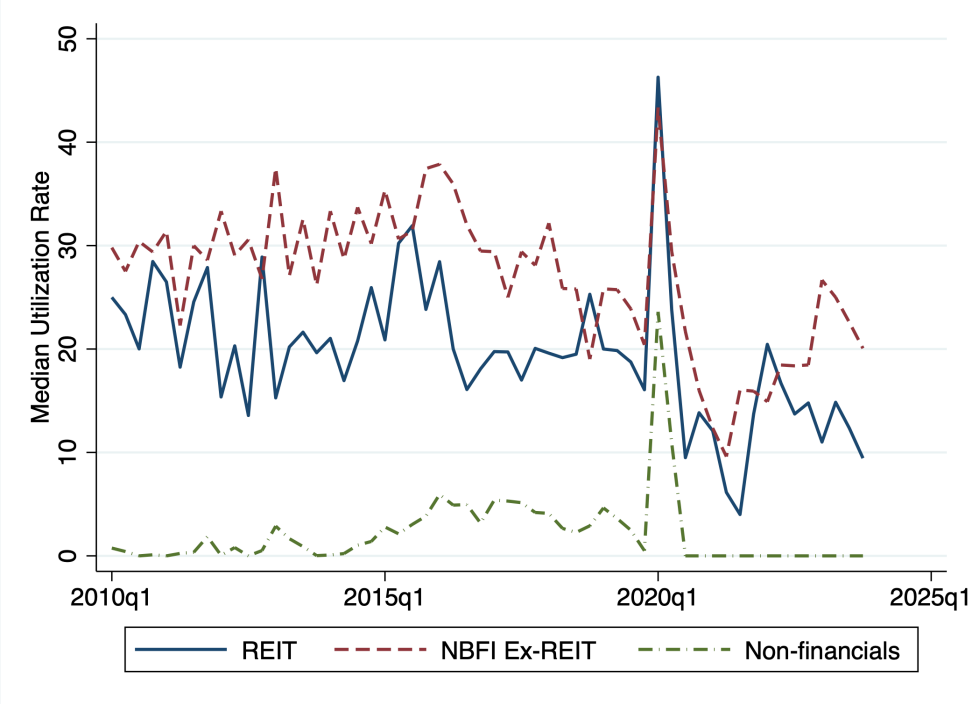
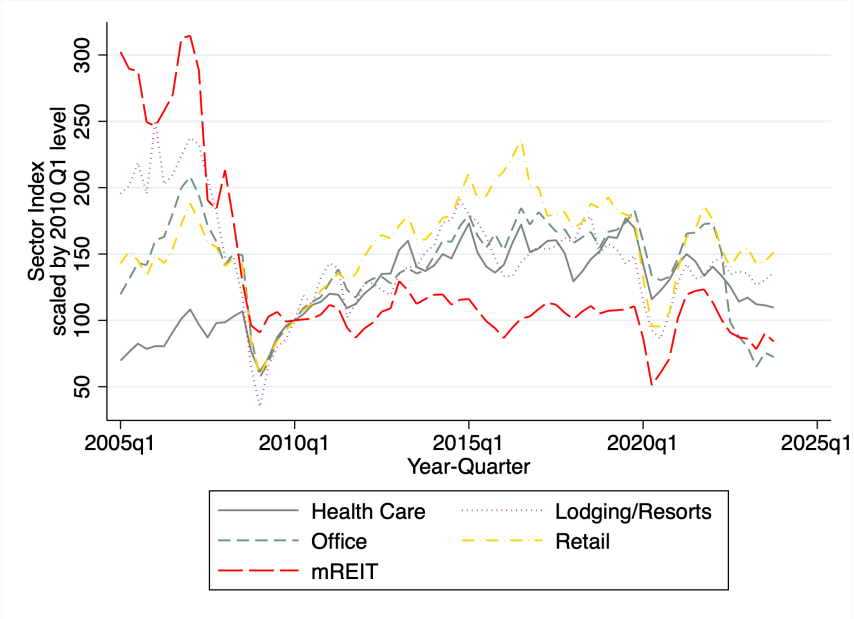


Figure OA.8: REIT long-term stock market performance by subsector

This figure plots the quarterly stock market returns of various REIT subsectors from 2005Q1 to 2023Q4. All stock prices are scaled by values in 2010Q1. Indices are created as a weighted average of individual REIT prices, with the weights corresponding to the market capitalization of each REIT in 2010Q1. Panel A plots REIT subsectors with less than 200% growth rate between 2010 and 2022, and Panel B plots REIT subsectors with more than 200% growth. Stock price data is from CRSP.

Panel A - Small growth REITs



Panel B - Large growth REITs

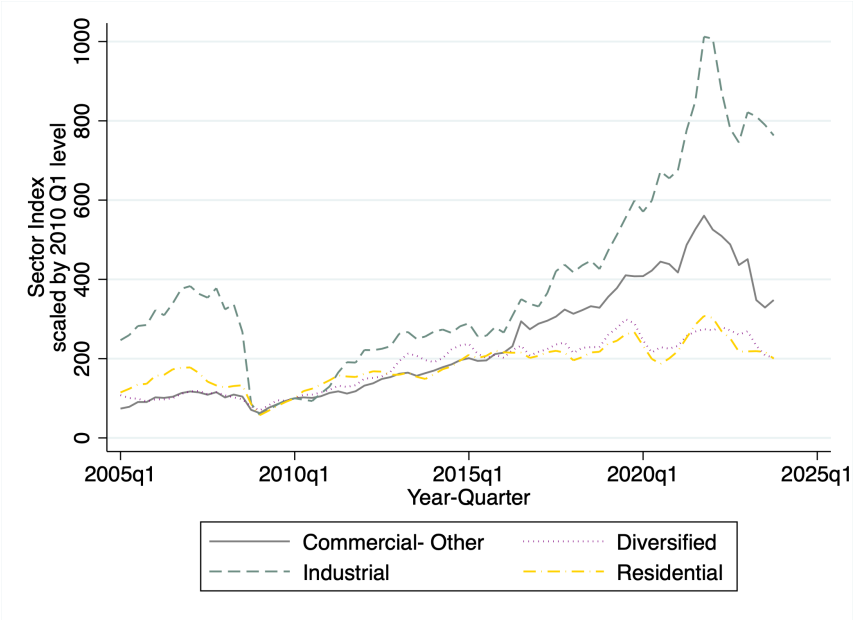
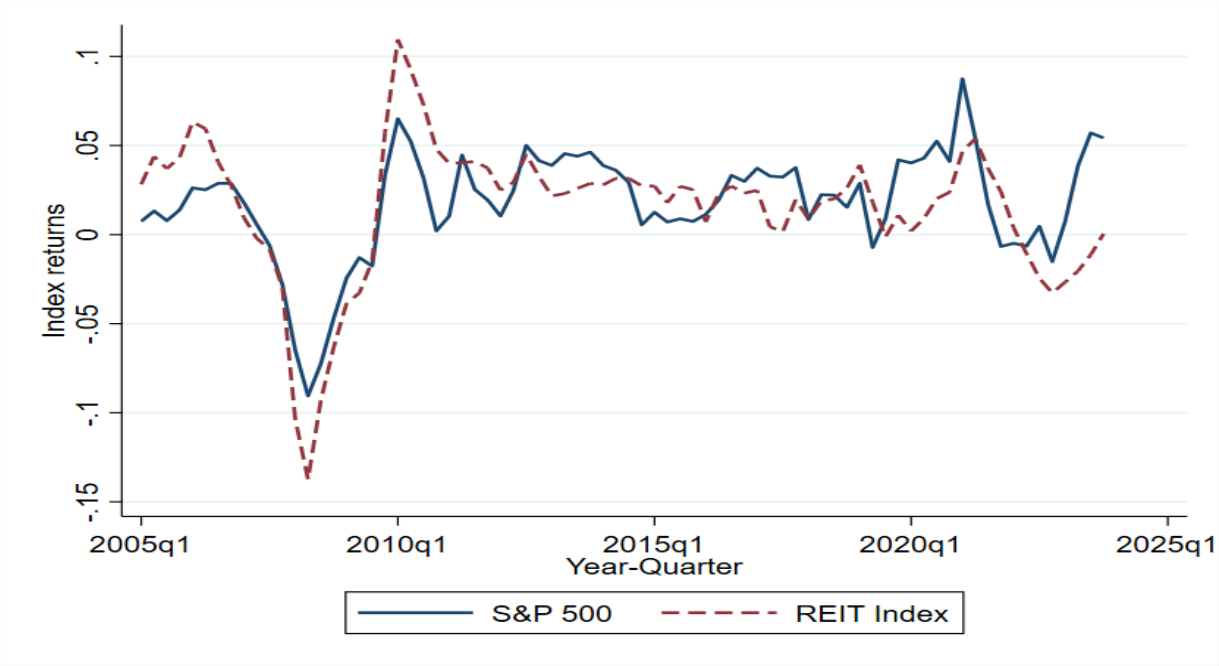


Figure OA.9: Co-Movement of the S&P 500 and REIT stock market performance

This figure shows comparisons between the S&P 500 and a REIT stock market index. Panel A plots the quarterly return smoothed with a symmetric 7-quarter moving average. Panel B plots a 2-year backward-looking moving average of the volatility of quarterly returns. Data is from 2005Q1 to 2023Q4 and is obtained from CRSP.

Panel A - Quarterly index return



Panel B - Volatility of Returns

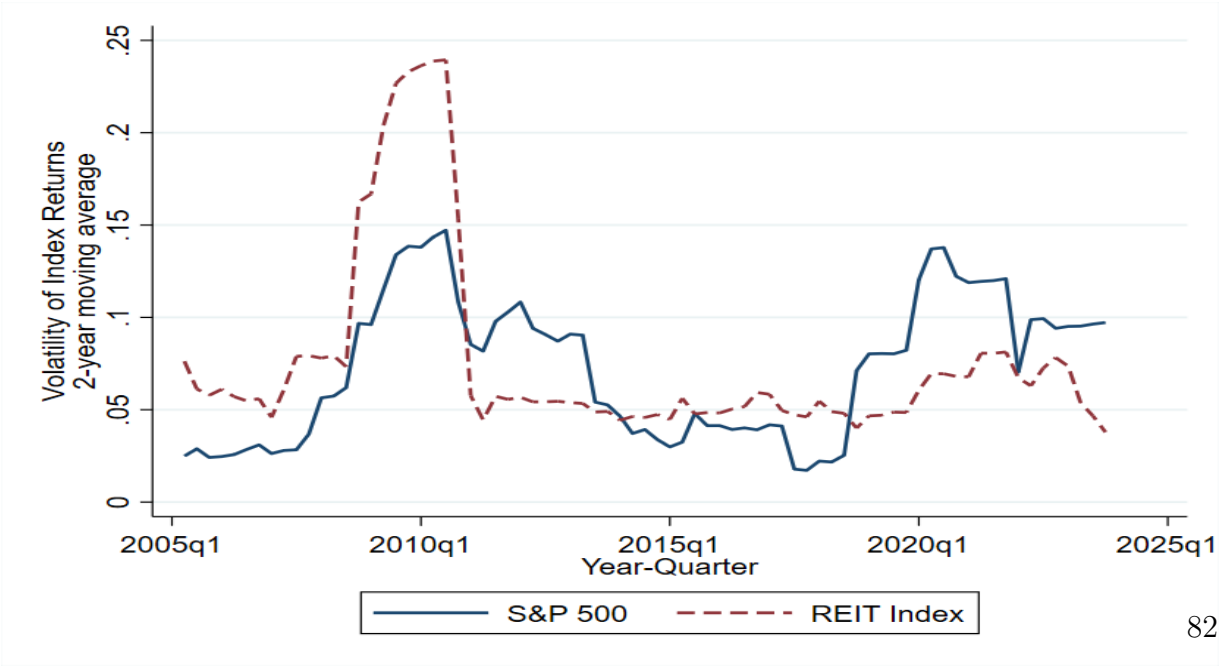


Table OA.1: Summary Statistics - Borrower and Loan Characteristics - Median

This table displays descriptive statistics of our dataset. Panel A shows descriptive statistics at the borrower-quarter level taken from Capital IQ and Compustat. Numbers are averages over the 2005–2023 period. Panel B shows descriptive statistics on the credit line contract terms from DealScan. We split borrowers into three groups: REITs, NBFIs excluding REITs (SIC Code 60-67), and non-financial companies.

Panel A - Firm Characteristics

Log(Assets in mil.) measures firm size, *Debt/Equity* measures firm leverage, *Credit Line/Assets* measures the ratio of bank credit lines to firm assets, *Secured Facility Share* measures the share of total committed credit line volume that is issued as a secured facility, *Liquidity/Assets* measures the amount of liquidity available to the firm as cash and cash equivalents minus debt in current liabilities, *Short Term Debt Ratio* measures the share of short term (maturity of less than 1 year) debt to total debt of the firm, and *Debt Issuance/Assets* measures the average size of a firm's bond issuance. These variables are winsorized at the 1% and 99% level. *Unrated* is the share of firms without a credit rating. *Rating* is the average rating of the firm after converting credit ratings to a numerical scale with 1 for AAA, 2 for AA, and so on. Unrated firms are given a rating value of 10.

	Median		
	REIT	NBFI Ex-REIT	Non-financial
Log(Assets in mil.)	8.09	8.77	7.71
Debt/Equity	1.21	0.59	0.72
Credit Line/Assets	0.15	0.08	0.14
Secured Facility Share	0.00	0.00	0.00
Liquidity/Assets	0.00	0.04	0.02
Short Term Debt Ratio	0.04	0.07	0.05
Debt Issuance/Assets	0.10	0.03	0.05
Unrated	0.00	0.00	0.00
Rating	4.00	4.00	5.00
Observations	1118	1352	13696

Panel B - Loan Characteristics

Loan size (mil.) measures size of the credit line balance, *(Un)drawn spread* is the cost on the (un)drawn portion of the credit line. *Maturity* is the average maturity of the credit line in months. These variables are winsorized at the 1% and 99% level. *Financial (General) Covenants* measures the share of credit lines that have any financial (general) covenant.

	Median		
	REIT	NBFI Ex-REIT	Non-financial
Loan Size (mil.)	415.00	350.00	105.00
Drawn spreads (bps)	150.00	150.00	200.00
Undrawn spreads (bps)	25.00	20.00	25.00
Maturity (months)	48.00	48.00	60.00
Financial Covenanats	1.00	0.00	0.00
General Covenanats	0.00	0.00	0.00
Observations	1228	1627	49710

Table OA.2: Summary Statistics - Borrower and Loan Characteristics

This table displays descriptive statistics by rating categories: all As, BBB, non-IG, unrated. Variables and data sources are identical to Panel A of Table 1.

Panel A - All A rated

	REIT	NBFI Ex-REIT	Non-financial
	Mean	Mean	Mean
Log(Assets in mil.)	8.65	10.66	8.96
Debt/Equity	3.16	2.66	1.06
Credit Line/Assets	0.14	0.05	0.15
Liquidity/Assets	0.00	0.07	0.02
Secured Facility Share	0.22	0.14	0.17
Short Term Debt Ratio	0.05	0.23	0.17
Debt Issuance/Assets	0.16	0.04	0.08
Loan Size (mil.)	978.39	1,386.44	954.24
Drawn spreads (bps)	145.87	121.41	120.85
Undrawn spreads (bps)	21.36	14.50	17.02
Maturity (months)	45.66	39.55	48.13
Financial Covenanats	0.75	0.36	0.54
General Covenanats	0.40	0.11	0.20
Observations	125	302	2115

Panel B - BBB rated

	REIT	NBFI Ex-REIT	Non-financial
	Mean	Mean	Mean
Log(Assets in mil.)	8.47	9.50	8.66
Debt/Equity	1.82	1.34	1.05
Credit Line/Assets	0.19	0.12	0.17
Liquidity/Assets	0.01	0.11	0.05
Secured Facility Share	0.11	0.14	0.29
Short Term Debt Ratio	0.07	0.13	0.15
Debt Issuance/Assets	0.16	0.07	0.11
Loan Size (mil.)	837.22	732.52	865.91
Drawn spreads (bps)	150.03	142.39	147.86
Undrawn spreads (bps)	24.67	20.94	21.50
Maturity (months)	44.21	44.21	49.86
Financial Covenanats	0.61	0.50	0.54
General Covenanats	0.16	0.28	0.27
Observations	228	288	2382

Summary Statistics - Borrower and Loan Characteristics - Continued

Panel C - Non-IG rated

	REIT	NBFI Ex-REIT	Non-financial
	Mean	Mean	Mean
Log(Assets in mil.)	8.11	8.51	7.55
Debt/Equity	1.88	1.83	1.10
Credit Line/Assets	0.17	0.14	0.19
Liquidity/Assets	-0.02	0.07	0.06
Secured Facility Share	0.19	0.35	0.56
Short Term Debt Ratio	0.12	0.23	0.15
Debt Issuance/Assets	0.13	0.12	0.15
Loan Size (mil.)	516.21	487.37	510.50
Drawn spreads (bps)	172.23	193.60	206.58
Undrawn spreads (bps)	26.57	28.46	32.82
Maturity (months)	42.00	42.25	49.50
Financial Covenanats	0.58	0.59	0.56
General Covenanats	0.21	0.30	0.43
Observations	749	637	8760

Panel D - Unrated

	REIT	NBFI Ex-REIT	Non-financial
	Mean	Mean	Mean
Log(Assets in mil.)	7.68	8.02	7.73
Debt/Equity	1.46	2.11	1.24
Credit Line/Assets	0.18	0.28	0.20
Liquidity/Assets	-0.00	0.02	0.02
Secured Facility Share	0.37	0.42	0.31
Short Term Debt Ratio	0.09	0.19	0.11
Debt Issuance/Assets	0.18	0.19	0.17
Loan Size (mil.)	423.37	720.77	235.56
Drawn spreads (bps)	200.41	181.07	263.54
Undrawn spreads (bps)	31.19	29.28	33.71
Maturity (months)	41.81	40.36	47.29
Financial Covenanats	0.60	0.25	0.09
General Covenanats	0.25	0.35	0.06
Observations	126	400	36453

Table OA.3: Differential credit line utilization of REITs - Impact of Capital Structure

This table presents results of running regression specification 1 with additional interaction terms. The sample period is 2005Q1 to 2023Q4. REIT takes a value of one for REITs and zero for all other NBFI and non-financial firms. We add the logarithm of total assets, firm leverage (total debt to equity), the level of liquid assets over total assets, the ratio of short-term debt to total debt, the size of quarterly debt issuance over total assets, return on assets, and an indicator for whether the remaining volume-weighted maturity on outstanding credit lines is less than a year as control variables. All continuous variables are standardized to have a mean of 0 and standard deviation of 1. Columns (2) to (8) sequentially add interactions of the REIT indicator with capital structure characteristics. Standard errors are clustered at the borrower level.

	Utilization Rate (%)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
REIT	5.109**	4.936**	5.806**	5.725**	5.986***	5.466**	6.103**	5.173**
	(2.170)	(2.061)	(2.426)	(2.224)	(2.285)	(2.275)	(2.571)	(2.259)
Log(Assets in mil.)	−4.316***	−4.318***	−4.305***	−4.333***	−4.319***	−4.306***	−4.294***	−4.316***
	(0.418)	(0.418)	(0.419)	(0.418)	(0.418)	(0.418)	(0.419)	(0.418)
Debt/Equity	0.599***	0.591***	0.603***	0.594***	0.598***	0.602***	0.599***	0.599***
	(0.170)	(0.171)	(0.170)	(0.170)	(0.170)	(0.170)	(0.170)	(0.170)
Liquidity/Assets	−8.650***	−8.649***	−8.670***	−8.635***	−8.650***	−8.652***	−8.650***	−8.650***
	(0.402)	(0.403)	(0.406)	(0.403)	(0.402)	(0.402)	(0.402)	(0.402)
Short Term Debt Ratio	2.556***	2.554***	2.567***	2.525***	2.556***	2.565***	2.564***	2.556***
	(0.302)	(0.302)	(0.303)	(0.304)	(0.302)	(0.303)	(0.303)	(0.302)
Return on Assets	−0.350	−0.350	−0.345	−0.356	−0.338	−0.349	−0.356	−0.350
	(0.354)	(0.354)	(0.354)	(0.353)	(0.354)	(0.354)	(0.353)	(0.354)
Debt Issuance/Assets	4.192***	4.190***	4.197***	4.187***	4.192***	4.219***	4.198***	4.192***
	(0.204)	(0.204)	(0.204)	(0.204)	(0.204)	(0.207)	(0.204)	(0.204)
Maturity < 1 year	−0.791*	−0.794*	−0.792*	−0.786*	−0.791*	−0.793*	−0.792*	−0.775
	(0.477)	(0.478)	(0.477)	(0.477)	(0.477)	(0.477)	(0.477)	(0.481)
REIT x Debt/Equity		0.402						
		(1.303)						
REIT x Liquidity/Assets			1.824					
			(1.896)					
REIT x Short Term Debt Ratio				2.297				
				(2.013)				
REIT x Return on Assets					−5.464			
					(4.034)			
REIT x Debt Issuance/Assets						−1.409		
						(0.895)		
REIT x Log(Assets in mil.)							−2.080	
							(3.264)	
REIT x Maturity < 1 year								−0.824
								(3.688)
Rating Group FE	Y	Y	N	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y
Obs.	169,635	169,635	169,635	169,635	169,635	169,635	169,635	169,635
R^2	0.203	0.203	0.203	0.203	0.203	0.203	0.203	0.203

Table OA.4: Differential credit line utilization of REITs as a function of stock returns – robustness with interactions

The table presents results on the impact of market conditions on borrower credit line utilization. The sample period is 2005Q1 to 2023Q4. In Column (1), we analyze the sensitivity of credit line drawdowns to stock market performance (S&P 500). In Column (2), we separate the impact of positive and negative market perfomance on credit line utilization. In Column (3), we analyze the sensitivity of credit line utilization to market volatility (VIX). In Column (4), we analyze the sensitivity of credit line utilization in crisis times. *Crisis* is an indicator that takes a value of one during the GFC (2007Q3-2009Q2) and COVID-19 (2020Q1). In Column (5), we analyze credit line utilization to a borrower's industry performance (sub-sector return) calculated after excluding the borrower from the calculations of industry performance. Sub-sector return is measured as a weighted average of quarterly stock returns for firms in the same 2-digit SIC code for non-REITs and REIT-sub group classification for REITs. For REITs, sub-sector return is based on REIT classification into one of 9 sub-groups - Health Care, Industrial, Lodging/Resorts, Mortgage, Office, Residential, Retail, Diversified, or Commercial- Other. We regress sub-sector return against S&P 500 and estimate the residual. We then look at the impact of aggregate market conditions (S&P 500) and own industry conditions on borrower utilization. In column (6), (7) and (8), we include measures of aggregate credit conditions as measured by the Excess Bond Premium (EBP, see Gilchrist and Zakrajšek (2012)), Excess Loan Premium (ELP, see Saunders et al. (Forthcoming)), and spreads on financial commercial paper. *REIT* takes a value of one for REITs and zero for all other financial and non-financial firms. We add the logarithm of total assets, the level of liquid assets over total assets, firm leverage (debt to equity), short term debt over total debt ratio, the return of assets and debt issuance over total assets as well as the interaction of these variables with the respective indicator of market stress as control variables in all columns. All continuous variables are standardized to have a mean of 0 and standard deviation of 1. Standard errors are clustered at the borrower level.

	Utilization Rate (%)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
REIT	4.753***	3.840**	4.790***	4.319***	3.727**	4.735***	4.948***	4.791***
	(1.409)	(1.504)	(1.409)	(1.503)	(1.655)	(1.413)	(1.471)	(1.407)
REIT x S&P 500 return	-1.904***					-1.953***	-1.831***	-2.033***
	(0.504)					(0.505)	(0.544)	(0.499)
REIT x Positive S&P 500 return		-0.129						
		(1.219)						
REIT x Negative S&P 500 return		-2.782***						
		(0.792)						
REIT x VIX			1.548**					
			(0.716)					
REIT x Crisis				3.784				
				(2.347)				
REIT x Sub-sector return					-2.621***			
					(0.884)			
REIT x EBP						-0.128		
						(0.662)		
REIT x ELP							0.576	
							(0.937)	
REIT x CP Spread								-0.344
								(0.820)
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Rating Group FE	Y	Y	Y	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y
Obs.	174,686	174,686	174,686	174,686	115,514	174,686	161,521	174,686
R^2	0.196	0.196	0.196	0.196	0.195	0.196	0.193	0.196

Table OA.5: Reasons for credit line utilization by REITs - Dependence on S&P500

The table presents results of running regression specification 4. The sample period is 2005Q1 to 2023Q4. Crisis is replaced by the aggregate S&P500 stock market return. Drawdown is the change in the dollar value of used credit line balance between the current and previous quarter. Panel A shows the results for investments, Panel B shows the results for cash and cash equivalents, and Panel C shows the results for total dividend payout. Standard errors are clustered at the firm-level.

Panel A - Investment ($)

	(1) h=0	(2) h=1	(3) h=2	(4) h=3	(5) h=4
Drawdown (in USD) in t	0.315***	0.310***	0.311***	0.350***	0.381***
	(0.073)	(0.083)	(0.076)	(0.091)	(0.107)
Drawdown (in USD) in t x S&P500 return	0.0911	0.0439	0.0589	0.0523	0.0421
	(0.055)	(0.057)	(0.075)	(0.088)	(0.099)
Firm FE	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y
Obs.	12,979	12,611	12,227	11,949	11,577
R^2	0.069	0.110	0.147	0.186	0.226

Panel B - Cash and cash equivalents ($)

	(1) h=0	(2) h=1	(3) h=2	(4) h=3	(5) h=4
Drawdown (in USD) in t	0.00144	-0.0200	0.00651	-0.00551	-0.0162
	(0.042)	(0.021)	(0.021)	(0.034)	(0.021)
Drawdown (in USD) in t x S&P500 return	-0.141***	-0.0601***	-0.0331	-0.00871	-0.00568
	(0.032)	(0.021)	(0.022)	(0.021)	(0.017)
Firm FE	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y
Obs.	13,277	12,919	12,543	12,219	11,887
R^2	0.256	0.309	0.353	0.387	0.413

Panel C - Total Dividend Payout ($)

	(1) h=0	(2) h=1	(3) h=2	(4) h=3	(5) h=4
Drawdown (in USD) in t	0.00838**	-0.00216	-0.00350	-0.00182	0.00185
	(0.004)	(0.004)	(0.003)	(0.002)	(0.003)
Drawdown (in USD) in t x S&P500 return	-0.00203	0.00267	0.00529*	0.00704***	0.00786**
	(0.002)	(0.005)	(0.003)	(0.003)	(0.003)
Firm FE	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y
Obs.	12,988	12,617	12,242	11,907	11,580
R^2	0.195	0.207	0.222	0.200	0.255

Table OA.6: Reasons for credit line utilization by REITs - Dependence on EBP

The table presents results of running regression specification 4. The sample period is 2005Q1 to 2023Q4. Crisis is replaced by the excess bond premium from Gilchrist and Zakrajšek (2012). Drawdown is the change in the dollar value of used credit line balance between the current and previous quarter. Panel A shows the results for investments, Panel B shows the results for cash and cash equivalents, and Panel C shows the results for total dividend payout. Standard errors are clustered at the firm-level.

Panel A - Investment ($)

	(1) h=0	(2) h=1	(3) h=2	(4) h=3	(5) h=4
Drawdown (in USD) in t	0.309***	0.307***	0.305***	0.345***	0.378***
	(0.073)	(0.082)	(0.074)	(0.090)	(0.107)
Drawdown (in USD) in t x EBP	-0.0649	-0.0262	-0.0668	-0.0494	-0.0229
	(0.041)	(0.053)	(0.069)	(0.085)	(0.090)
Firm FE	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y
Obs.	12,979	12,611	12,227	11,949	11,577
R^2	0.068	0.110	0.147	0.186	0.226

Panel B - Cash and cash equivalents ($)

	(1) h=0	(2) h=1	(3) h=2	(4) h=3	(5) h=4
Drawdown (in USD) in t	0.00873	-0.0177	0.00467	-0.0104	-0.0210
	(0.044)	(0.020)	(0.022)	(0.033)	(0.023)
Drawdown (in USD) in t x EBP	0.0775***	0.0188	-0.0284	-0.0621	-0.0655
	(0.024)	(0.035)	(0.054)	(0.052)	(0.041)
Firm FE	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y
Obs.	13,277	12,919	12,543	12,219	11,887
R^2	0.245	0.308	0.353	0.387	0.414

Panel C - Total Dividend Payout ($)

	(1) h=0	(2) h=1	(3) h=2	(4) h=3	(5) h=4
Drawdown (in USD) in t	0.00880**	-0.00156	-0.00307	-0.00172	0.00170
	(0.003)	(0.004)	(0.003)	(0.002)	(0.003)
Drawdown (in USD) in t x EBP	0.00460	0.00760**	0.00623	0.00332	0.000498
	(0.005)	(0.003)	(0.004)	(0.004)	(0.005)
Firm FE	Y	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y	Y
Obs.	12,988	12,617	12,242	11,907	11,580
R^2	0.195	0.207	0.222	0.199	0.254

Table OA.7: Effect of REIT Exposure on Bank Stock Returns – Crisis (robustness with interaction terms)

This table shows results of regressing bank stock returns on bank credit line commitment levels scaled by total assets as well as on a crisis indicator. The sample period is 2005Q1 to 2023Q4. The crisis indicator takes the value 1 for the GFC (2007Q3 to 2009Q2) and the Covid-19 period (2020Q1). Column (2) replaces the overall credit line commitments by REIT credit line commitments scaled by total assets. Column (3) adds non-REIT credit line commitments scaled by total assets. Column (4) adds term loans to REITs scaled by total assets. Column (5) adds the on-balance sheet exposure to CRE scaled by total assets. All these terms are added jointly with an interaction with the crisis dummy. All columns employ bank and time fixed effects, a set of controls close to the setup in Acharya et al. (2024b) and the Fama-French 3-factor model. All columns further add an interaction term each between the crisis dummy and the log of total assets, the capitalization ratio and the return on assets. All continuous variables are standardized to have a mean of 0 and a standard deviation of 1. Standard errors are clustered at the bank-level.

	Quarterly bank stock returns (%)				
	(1)	(2)	(3)	(4)	(5)
Overall Commitments (std.)	0.132				
	(0.223)				
Overall Commitments (std.) x Crisis	-0.718				
	(0.468)				
REIT CL Exposure (std.)		-0.135	-0.183	-0.155	-0.149
		(0.146)	(0.149)	(0.148)	(0.140)
REIT CL Exposure (std.) x Crisis		-1.032**	-0.917**	-1.016***	-0.840**
		(0.419)	(0.360)	(0.355)	(0.336)
Non-REIT CL Exposure (std.)			0.169	0.162	0.130
			(0.232)	(0.231)	(0.219)
Non-REIT CL Exposure (std.) x Crisis			-0.630*	-0.575*	-0.700***
			(0.344)	(0.338)	(0.262)
REIT TL Exposure (std.)				-0.235	-0.221
				(0.151)	(0.145)
REIT TL Exposure (std.) x Crisis				0.554	0.508
				(0.360)	(0.381)
CRE Exposure (std.)					0.223
					(0.318)
CRE Exposure (std.) x Crisis					-2.279***
					(0.513)
Constant	37.29***	38.71***	38.80***	38.83***	39.28***
	(7.728)	(7.816)	(6.138)	(6.176)	(6.334)
Controls	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y
Obs.	8,983	8,983	8,983	8,983	8,983
R^2	0.609	0.610	0.610	0.610	0.611