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

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Abstract

We study the implications of banks extending credit lines to non-bank financial intermediaries (NBFIs), using real estate investment trusts (REITs) as an economically important example. While smaller banks hold significant direct exposures in CRE loans, the CRE exposure of large banks is also indirect via credit-line provision to REITs. REITs' credit-line utilization is substantially more sensitive to market stress than for other publicly-traded NBFIs and corporates. In turn, large banks suffer drawdowns on credit lines to REITs and attendant equity corrections in stress times. Ignoring this NBFI credit-line channel understates the exposure of large banks to aggregate stress.

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. 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, REITs are the biggest recipients of bank-originated credit lines out of all NBFIs. As shown in Panel A of Figure 1, CL commitments to REITs by banks have risen in im-

[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).

portance post-GFC, growing to around 40% of all credit lines originated to publicly listed NBFIs for the last several years. Third, REITs exhibit significantly higher utilization rates on bank credit lines (29%) compared to non-financial firms (22%). Moreover, Panel B of Figure 1 clearly shows that their credit line usage is markedly more sensitive to aggregate market performance, as indicated by the slope coefficients. 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.

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

[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.

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.[7] In Internet Appendix B, we discuss channels driving this market segmentation between large banks' involvement in REIT CLs and smaller banks' involvement in direct CRE lending.[8]

Why do bank credit line exposures to REITs matter? While outstanding credit lines of REITs are large in absolute amounts, their default risk (based on historical default rates) is low. Thus, one could assume that banks are not adversely impacted by elevated default risks even when committed credit line exposures are large. However, as we discuss in detail in the paper, credit lines of REITs exhibit a higher utilization rate 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). These credit line drawdowns encumber bank capital away from more lucrative intermediation opportunities because of capital requirements and loan loss provisions, when credit lines of REITs become loans on bank balance sheets. This is due to the fact that off-balance-sheet exposures only require partial capital funding and loan loss provisioning as long as they remain commitments. However, when they are drawn down and turn into on-balance-sheet loans during stress periods, capital and loan loss provisions therefore need to be built up, even

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

[7]Internet Appendix Figures IA.A.1 to IA.A.6 provide a more detailed description of banks' exposures.

[8]Establishing causality of these channels in driving the preference of large banks for CRE exposure via REIT CLs requires further detailed analysis. This, however, is not the central aspect of the paper. Instead, we are interested in the implications of these credit lines for NBFIs and systemic risk.

without an increase in default probabilities of the borrower (see Acharya, Engle, Jager, and Steffen (2024b) for a detailed discussion). This, in turn, reduces banks' expected earnings.

When credit line drawdowns are large, we observe a significant decline in bank stock returns reflecting banks' lower expected earnings (see, for example, Acharya et al. (2024b)). Moreover, credit line contracts to REITs do not reflect elevated drawdowns during these periods as loan pricing is not different vis-a-vis other NBFIs or non-financial corporates. As a result, the largest U.S. banks experience a significant capital shortfall 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.[9] This leads to a disproportionately large dependence of REITs on bank credit lines for liquidity during stress periods. 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 suggesting they use both their cash and the liquidity from credit lines to acquire properties and pay out dividends. We interact credit line drawdowns with a crisis indicator (taking a value of one during the GFC and COVID-19), and find that REITs start building cash buffers during stress periods and they discontinue 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. The

[9]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.

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 returns 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. 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 in response to idiosyncratic shocks within specific REIT subsectors.

To identify which underlying mechanism is associated with the decline in stock returns, we run local projections of bank balance sheet and income statement items to gauge the impact REIT drawdowns have on banks. We find that banks' return on assets reduces as a consequence of lower net income which, in turn, is a consequence of higher loan loss provisions. Because of the IFRS 9 accounting standard, banks have to increase loan loss provisions as soon as credit line drawdowns enter the balance sheet, regardless of changes to borrower default probabilities, and the encumbrance of this capital affects both their income statement immediately and their future intermediation capacity. In an additional horserace-type analysis, we identify capital, not liquidity, as a key driver of bank stock returns, in line with the erosion of capital through lower profits/higher loan loss provisions being more

[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.

problematic for banks with lower equity levels.[11]

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? 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. To benchmark pricing per unit of bank capital, we compute a capital-normalized return on equity (RoE) for each loan, with risk weights from the Standardized Approach. Comparing loans to REITs and non-REITs, capital-adjusted returns are similar, implying banks charge comparable spreads per dollar of required equity. These results highlight an important component in banks' pricing incentives. While banks very cautiously price the cyclicality of drawdown behavior for non-financial borrowers (Acharya, Gopal, and Steffen (2025)), they benefit from preferential capital treatment for financial, i.e. NBFI, borrowers allowing them to be less sensitive to those companies' drawdowns.[12] Our credit line utilization results, however, suggest that while lower capital requirements may make sense for non-REIT NBFIs, it seems less justifiable for REITs, who have both higher and more cyclical credit line usage than both NBFIs and non-financial firms. This, in turn, leads to higher capital encumbrance.

In the final part, therefore, we estimate the market-implied increase in banks' capital requirements during aggregate stress periods due to credit lines to REITs. To do this, 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 the S&P 500) vis-a-vis a benchmark capital requirement, by incorporating REIT and non-REIT credit lines in stress test scenarios. We compare three models: one treating

[11] We are not arguing that liquidity is unimportant in understanding the impact of credit line drawdowns on banks. Our results, however, emphasize a more prominent role of bank capital. This is consistent with, for example, Acharya et al. (2024b) who also highlight the role of the Federal Reserve as lender of last resort alleviating immediate liquidity problems of banks during stress periods.

[12] For example, in the standardized approach, B-rated financial firms have a risk weight of 100% while non-financial corporations are given a risk weight of 150%.

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. In particular, the preferential treatment of financial borrowers in the capital requirement framework does not seem to be justified for REITs.

2 Related Literature

Our study relates to different strands of literature. We first relate to the literature highlighting the role of banks in liquidity provision. Kashyap, Rajan, and Stein (2002) and Gatev and Strahan (2006) propose a unique role for banks as liquidity providers to both households and firms, given efficiency in risk management (via cash holdings) and access to government backstops (which induces a flight to safety in deposits), respectively. However, the exposure to (undrawn) 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).[13] We document that REITs, in particular, have higher drawdown rates as compared to other NBFIs and non-financial corporates, which leads to encumbered capital and a drop in stock prices during periods of aggregate stress. We also document that this elevated risk of REIT credit lines does not seem to be priced by banks.

[13]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.

Our paper also related to the literature on bank and NBFI funding relationships. Acharya et al. (2024a), Jiang, Matvos, Piskorski, and Seru (2020) and Jiang, Matvos, Piskorski, and Seru (2023), for example, document that NBFIs (including mortgage lenders) obtain significant funding from traditional banks through credit lines. While Jiang et al. (2023) shows that non-bank mortgage lenders receive most of their debt funding through credit lines from the same banks that compete with them in loan origination markets, Jiang et al. (2020) focuses on understanding banks' capital structure decisions. Banks also extend liquidity to money market funds (Jacewitz, Unal, and Wu, 2021), broker-dealers (Caglio, Copeland, and Martin, 2021) and private debt lenders (Chernenko, Ialenti, and Scharfstein, 2025; Rintamäki and Steffen, 2025). We contribute to this literature examining the financial stability implications of these funding arrangements, a dimension not fully explored in prior work. This helps to understand of how bank-REIT credit relationships might amplify systemic risk during stress periods.[14]

Our paper finally relates to the broader literature of CRE exposure and bank risk. Two findings appear to be most relevant. First, CRE exposure amplifies bank risk: real-estate investments shape bank stock risk pricing (Mei and Saunders, 1995), and CRE concentration predicts bank failure across episodes (Cole and White, 2012; Altunbas, Manganelli, and Marques-Ibanez, 2017). We add a distinct channel – indirect CRE exposure via off-balance-sheet credit lines to REITs – showing how shocks migrate to banks even when direct CRE lending is unchanged.

Second, recent structural and rate shocks have reshaped CRE: work-from-home depresses office valuations (Gupta, Mittal, and Van Nieuwerburgh, 2022), rising rates stress banks through CRE holdings (Jiang et al., 2023), and recourse improves resilience (Glancy, Kurtzman, Loewenstein, and Nichols, 2023). We show that REIT credit-line drawdowns – at the

[14]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)).

borrower's discretion – transmit these shocks to bank balance sheets in real time, with risks concentrated at large banks that supply credit lines to NBFIs (including REITs).

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. Between 2013 and 2023, bank credit lines to NBFIs increased from 15% to 20% of their overall commitments (Acharya et al., 2024a). Among public firms, this share is even larger. NBFIs constituted 25 (33)% of bank credit commitments in 2010 (2023). Among the financial institutions, REITs are the largest category by size of credit line commitments with their relative share having grown from 30% in 2010 to almost 40% in 2023 (see Panel A of Figure 1).

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. 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 (Source: https://www.sec.gov/files/reits.pdf).

Background on Market Structure. Large banks dominate REIT lending while smaller banks remain focused on property-level CRE, reflecting differences in regulation, scale, and business models. First, on the regulatory side, REIT credit lines are treated favorably in the US bank capital frameworks since the implementation of the Basel II regulatory package in 2008, with particularly strong advantages for larger banks that use internal risk models.

Second, the credit line business is strongly concentrated at the top with the 50 largest banks by assets accounting for 99% of the commitments. Therefore, credit lines to any borrower class will be concentrated among large banks.

Third, REITs are large publicly-listed entities which smaller banks cannot easily cater to; median REIT loans exceed $400 million, far beyond the concentration limits of community and mid-sized banks. At the same time, REITs demand very large, programmatic credit lines, which only large banks can provide given their funding bases and market access.

Fourth, large banks also bundle ancillary services, providing not only credit lines but also bond underwriting, equity programs, and derivatives, making the overall REIT relationship profitable even with thin loan spreads. Smaller banks, by contrast, concentrate on property-level CRE lending that better matches their balance sheets, risk tolerance, and relationship-

based model. These loans are smaller, higher margin, and rely on local knowledge and close borrower ties.

In Internet Appendix B, we lay out each of these arguments in detail, and provide suggestive evidence in the form of descriptive figures and panel regressions that each of the above reasons appears to have played a role in fueling the shift from on-balance sheet CRE lending to off-balance sheet credit lines to REITs for the largest banks.

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') 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 Internet Appendix Table IA.A.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 informa-

tion of the key firm characteristics in Internet Appendix Figure IA.A.7. Internet Appendix Tables IA.A.2 and IA.A.3 provide further statistics for median and by firm ratings.

Panel B of Internet Appendix Table IA.A.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 Table 11.

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 *BHDM415* 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.[15]

Thus, we have an estimated exposure to REITs through term loans and credit lines by combining Call Report data on total lending with the relative share of lending to REITs from Dealscan. Importantly, the exposures that result from this exercise are comparable in size and ranking of banks to the ones reported in Acharya et al. (2024a) using Fed data.

Other than term loans where the literature is debating the share of the loan that remains with the lead arranger bank (Blickle, Fleckenstein, Hillenbrand, and Saunders (2020)), credit lines are not sold off to other (nonbank) investors and remain with the bank(s). The lead

[15]Dealscan is a database of syndicated loans – a line of business mostly undertaken by large banks. In our sample, the top 10 banks are responsible for 79% of all undrawn credit line commitments, as reported in the Call Reports. That is, the credit line business is also heavily concentrated at larger banks, which are well represented in DealScan. Therefore, for the purposes of matching credit line exposures, our approach appears unaffected by selection bias.

arranger bank is then usually the so-called fronting bank (Kiernan, Yankov, and Zikes (2021)) that takes the liquidity risk of providing the credit to borrowers before collecting the pro rata contributions from the other syndicate members.

In an optimal world, Call Reports would provide us with term loan exposure, drawn credit line exposure, and undrawn credit line exposure separately. However, call reports only report the sum of the former two as the on-balance sheet loan book and the latter as a standalone category. Thus, in the calculations above, we make the simplifying assumption that the on-balance sheet loan book is dominated by term loans. In a robustness exercise, we apply average drawdown rates of REIT and non-REIT borrowers to split the credit line exposure between the undrawn credit line commitments and the drawn credit line exposure that is part of the loan book. We then calculate REIT term loan exposure using only the on balance sheet lending coming from term loans (after subtracting the drawn credit line commitments). This has no qualitative impact on our results.

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 2023Q4. In addition, Internet Appendix Figure IA.A.8 shows the sum of direct and indirect CRE exposure, over time, for the three bank size groups. Internet Appendix Figure IA.A.9 shows the distribution of exposures within bank size groups.

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 line commitment.

4.1 Average utilization levels

In Panel B of Figure 1, we saw persistently higher levels and higher cyclicality of REIT credit line utilization. In Internet Appendix Figure IA.A.10, we depict the average and median utilization rates from 2010Q1 to 2023Q4 by borrower type.[16] These average differences are stark but mask significant heterogeneity across credit ratings. In Panel A of Table 1 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 1, 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

[16] 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 of other borrowers, suggesting that the utilization of credit lines by REITs is very sensitive to market conditions.

characteristics, we run the following regression on utilization rates:

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

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 Table 2. Column (1) runs a simplified version of specification 1 without fixed effects and controls. 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).[17] 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 5.3 percentage points.

In Internet Appendix Table IA.A.4, 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 Internet Appendix Table

[17] We want to stress that while credit ratings are an important predictor of drawdown behavior as demonstrated, e.g., in Table 1, we could not detect a differential gradient in utilization rates to credit ratings between REITs and non-REITs.

IA.A.5, in addition to the controls described above, we interact an indicator for REIT with 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, Panel B of Figure 1 and Table 1 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).[18]

The results of estimating the specification in Equation 2 are shown in Table 3. 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 2.98ppt 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[19]) or by financial frictions, in Column (6), (7), and (8), we study how credit supply affects borrower utilization. We measure aggregate credit supply con-

[18]For detailed performance illustrations of various REIT categories see Internet Appendix Figures IA.A.11 and IA.A.12. Internet Appendix Figure IA.A.13 shows comovement of REIT stock returns with S&P 500.

[19]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.

ditions using either the Excess Bond Premium (EBP. see Gilchrist and Zakrajšek (2012)), 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, Internet Appendix Table IA.A.6 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, Internet Appendix Table IA.A.7 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.[20] 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, 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.[21] We will get back to this pricing evidence in a more systematic fashion in Section 6.3. 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.[22]

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.[23] 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

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

[21]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.

[22]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.

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

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.[24]

This shows how redemptions of fund shares can affect the drawdown behavior 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 4. 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

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

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 Internet Appendix Table IA.A.8. 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 5:

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

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 5 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 behavior cannot be linked to price stabilizing behavior 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, 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 Internet Appendix Table IA.A.9, we interact credit line drawdowns with aggregate S&P 500 market returns. While economically smaller in magni-

tude, 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 Internet Appendix Table IA.A.10, 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.[25] 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

[25]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%.

(2021), Acharya et al. (2024b), Chodorow-Reich et al. (2022), and Greenwald, Krainer, and Paul (2023)). To test the impact on banks, we look at the impact of REIT drawdowns on bank stock returns, balance sheet/income statement, and investigate credit line pricing.

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. However, if there is a correlated drawdown of credit lines, it can have a large negative effect on bank balance sheets. Credit line drawdowns encumber bank capital away from more lucrative intermediation opportunities because of capital requirements and loan loss provisions, when credit lines of REITs become loans on bank balance sheets. This is due to the fact that for off-balance-sheet exposures banks are only required to hold capital for 50% of the committed amount for an undrawn line but for 100% of the amount for a drawn line (see Internet Appendix Table IA.A.15). The same conversion factor of 50% applies to loan loss provision accounts which therefore need to be stocked up as soon as the drawdown occurs, even without an increase in default probabilities of the borrower. This, in turn, reduces banks' expected earnings. Building on these regulatory forces, we therefore expect REIT drawdowns to negatively affect banks' future earnings potential. Thus, we test the impact of REIT drawdowns on stock returns.

For this purpose, we run the following regression

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

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.[26] μ_i and μ_t are bank and time fixed effects, respectively.

Table 6 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 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

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

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 Internet Appendix Table IA.A.11 which serves as an input for the SRISK exercise in Section 7) as well as different sets of control variables (see Internet Appendix Table IA.A.12).

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 7 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.

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 4, 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 GFC.

To probe the transmission channel, Internet Appendix Table IA.A.13 rescales REIT credit-line drawdowns by bank equity and by liquid assets. Equity scaling captures capital encumbrance from drawdowns that cannot be redeployed; liquidity scaling captures forced rebalancing toward liquid assets. Relative to the asset-scaled baseline in Column (1), drawdowns still predict lower bank stock returns under both equity (Column (2)) and liquidity (Column (3)) scaling, though standardized effects are smaller for liquidity. In a horse race (Column (4)) – after orthogonalizing equity and liquidity – equity-scaled drawdowns dominate, pointing to capital encumbrance as the primary channel, consistent with Acharya et al. (2024b).

6.2 Impact on Bank Balance Sheet

To explain why bank stock returns react more negatively when banks are more exposed to REITs in crises, we further trace the balance-sheet channel. In Table 8, we estimate local

projections for bank income- and balance-sheet outcomes, conditioning on direct CRE loans and on credit-line exposures to non-REIT borrowers.

Panel A of Table 8 shows that banks with higher REIT credit-line exposure experience a near-immediate decline in RoA during crises, with a magnitude comparable to direct CRE exposure. Panel B indicates a concurrent rise in total assets – mechanically consistent with drawdowns converting off-balance-sheet commitments into loans – so RoA falls via both a weaker numerator and a larger denominator. Despite this, Panel D documents higher operating revenue (consistent with interest and fee income on drawn lines), while Panel C shows net income declines in subsequent quarters. Panel E reconciles the pattern: loan-loss provisions rise with REIT drawdowns, offsetting the increase in revenues and pulling profits down. It is important to note that loan loss provisions, just as capital requirements, mechanically increase from drawdowns without any change to the borrower's probability of default. That is, these results do not necessarily reflect a deterioration in REIT creditworthiness but a regulatory effect.

Overall, the evidence points to a credit-cost/capital-encumbrance channel as the key mechanism linking REIT exposure to lower bank stock returns in crises.

6.3 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).

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 indicator and various control variables. 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.

To benchmark pricing per unit of bank capital, we compute a capital-normalized return on equity (ROE) for each loan, with risk weights from the Standardized Approach (varying by rating and by financial vs. non-financial borrower).[27] Importantly, the Standardized Approach prescribes only a 100% risk weight for financial companies rated BB or B while a non-financial borrower with the same rating would require a risk weight of 150%. Comparing loans to REITs and non-REITs, capital-adjusted returns are similar, implying banks charge comparable spreads per dollar of required equity (Column (6)).

In Internet Appendix Table IA.A.14 we investigate whether (the absence of) the pricing difference arises because certain characteristics of the contract, such as the maturity, the vol-

[27] We calculate return on equity as follows $\frac{LoanAmount \times Spread(in\%)}{LoanAmount \times 0.08 \times RiskWeight}$.

ume, 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. We detect no pattern of the interaction coefficients across the columns, however, that would indicate that banks consistently apply different pricing mechanisms for REITs.

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 would be necessary. This, however, goes beyond the scope of this paper.

A possible explanation for REITs not paying a substantial premium, despite their high utilization behaviour, is one stemming from regulatory forces. Table IA.A.15 in the Internet 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 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.[28] 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. This explanation is also suggested by our results on return on equity for banks being similar for REIT and non-REIT borrowers applying the risk weights from the Standardized Approach.

[28]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.

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 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 ad-

justments 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 drawdowns in crises periods. As documented in Section 4, these utilization rates differ significantly between REITs ($REIT$) and non-REIT companies ($Non\text{-}REIT$). 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 (non-)REIT commitments as we described in Section 3.3. We use the estimate drawdown sensitivity 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:

$$IncrementalSRISK_{i,t}^{LRMES^C} = (1 - K) \times Equity_{i,t} \times$$
$$- 0.4 \times [\gamma^{REIT} \times REIT\ Commitments_{i,t} + \gamma^{Non-REIT} \times Non - REIT\ Commitments_{i,t}] \quad (9)$$

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 $k = \{REIT, Non\text{-}REIT\}$.

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 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 Internet Appendix Table IA.A.11. 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.

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 depicted in Internet Appendix Figures IA.A.14 and IA.A.15 underscore these findings as indirect CRE exposure from credit lines to REITs carries a higher importance for capital shortfall than direct CRE exposure across

the whole distribution.

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 potentially revise current policies regarding uniform capital requirements for credit lines. Conversion factors from credit lines to capital requirements should reflect their expected drawdown intensity which can differ substantially as we have documented for REITs vs. non-REIT borrowers. 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 deserve further attention in terms of efficient policy responses to contain systemic risk implications.

While our paper focuses on an important class of publicly traded NBFIs, viz. REITs, it 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. 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.

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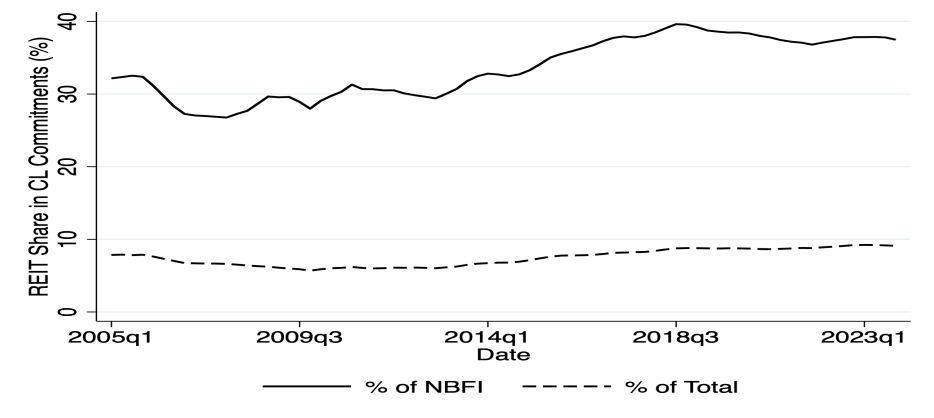
Figure 1: REITs – an important type of NBFIs

Panel A of this figure plots the share of credit line commitments made to REITs out of total credit line commitments made to publicly listed (NBFI) borrowers. Panel B of 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.

Panel A – Relevance of REIT credit lines



Panel B – Credit line utilization as a function of aggregate market performance

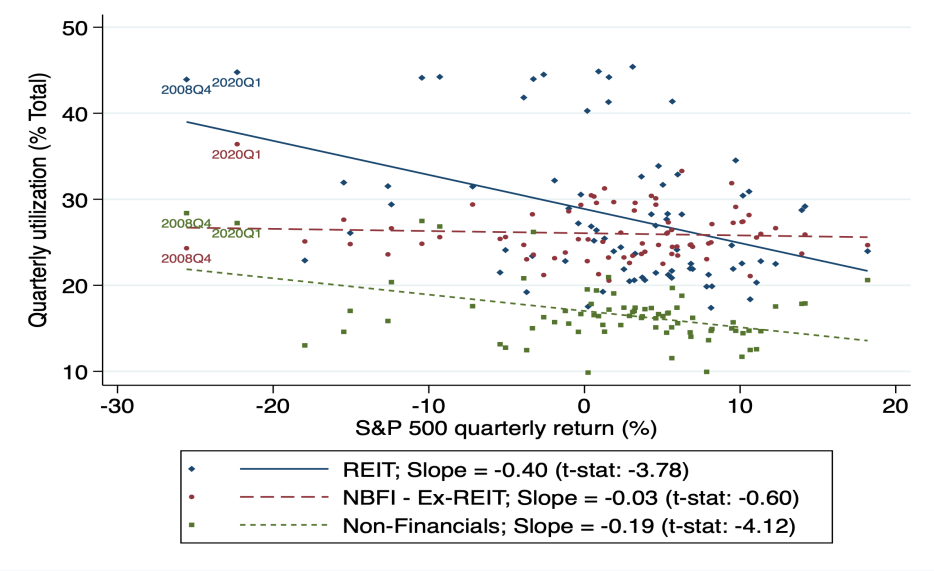
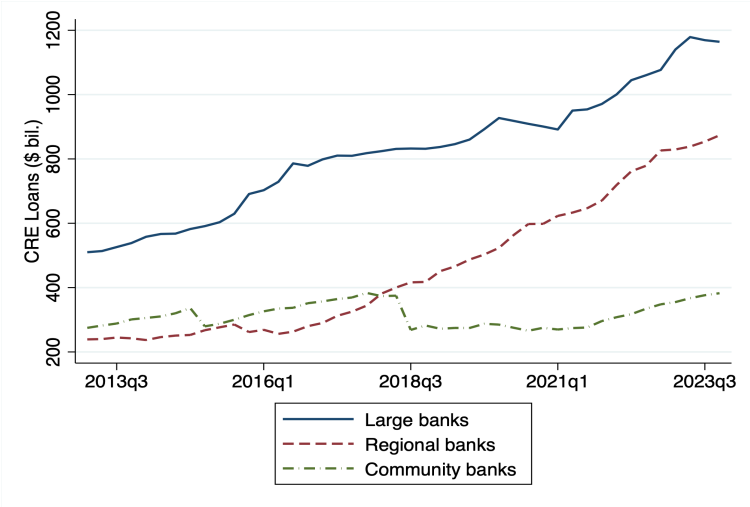


Figure 2: Commercial Real Estate (CRE) loans by bank type

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

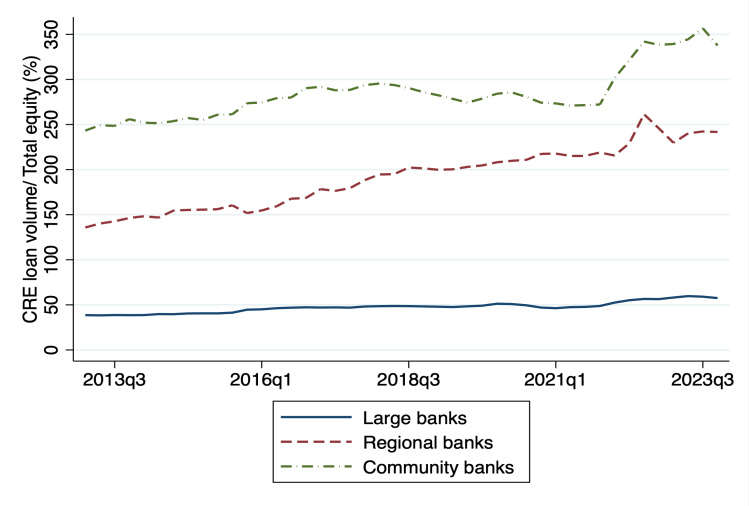


Figure 3: Banks' Exposure to Commercial Real Estate (CRE) by bank type

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.

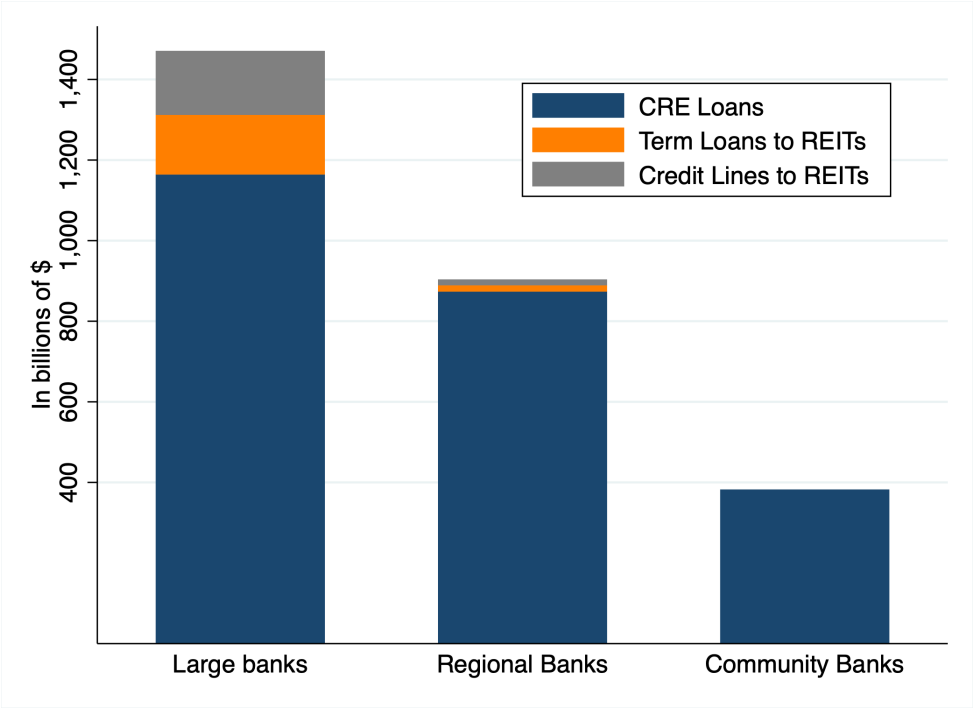


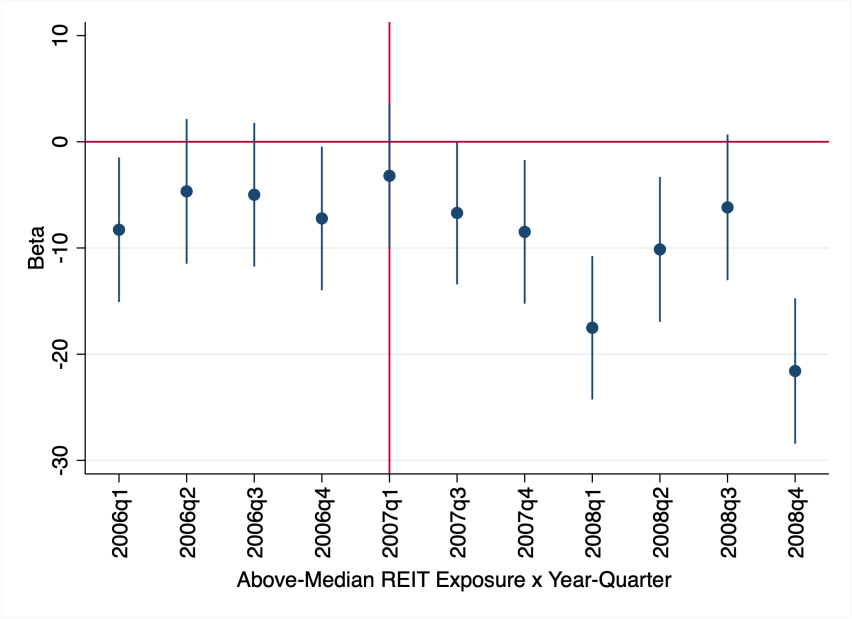
Figure 4: Bank stock market performance by REIT exposure

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 6 which includes Fama-French 3 factors, term loan exposure to REITs and direct CRE exposure.

Panel A - GFC



Panel B - COVID-19

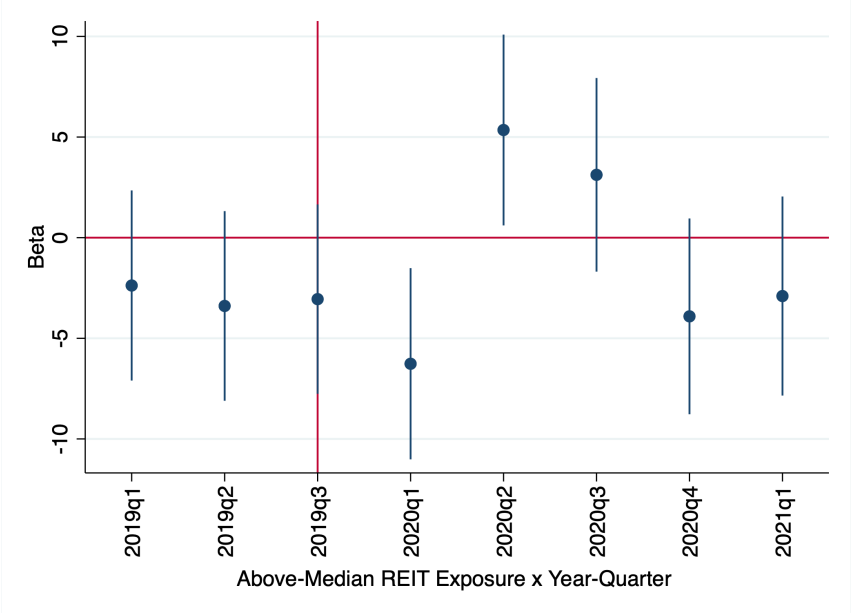


Table 1: Credit line utilization by company types and rating group

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	385	12	99	75	339
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	1,318	77	128	120	1,217
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	7,175	302	668	1,577	6,299
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 2: 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. We compare REITs with all other companies. The omitted group is non-financial borrowers. 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).

	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

Table 3: 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 4: 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 5: 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. All specifications include firm fixed effects and year-quarter fixed effects. 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)
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)
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)
Obs.	12,988	12,617	12,242	11,907	11,580
R^2	0.196	0.207	0.222	0.200	0.254

Table 6: 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.)		0.127	-0.0105	-0.0179	0.00898
		(0.125)	(0.163)	(0.187)	(0.188)
REIT CL Exposure (std.) x Crisis		-1.409***	-1.133**	-0.847*	-0.966**
		(0.418)	(0.477)	(0.507)	(0.430)
Non-REIT CL Exposure (std.)			0.546**	0.550**	0.545**
			(0.259)	(0.254)	(0.248)
Non-REIT CL Exposure (std.) x Crisis			-0.867**	-0.886**	-1.267***
			(0.393)	(0.390)	(0.396)
REIT TL Exposure (std.)				-0.00135	0.0147
				(0.0820)	(0.0811)
REIT TL Exposure (std.) x Crisis				-0.411	-0.597
				(0.649)	(0.689)
CRE Exposure (std.)					0.232
					(0.320)
CRE Exposure (std.) x Crisis					-2.033***
					(0.496)
Constant	40.13***	39.61***	39.31***	39.45***	40.09***
	(7.759)	(7.812)	(5.921)	(5.883)	(6.035)
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	0.608	0.608	0.610

Table 7: 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.)		-0.00374	-0.0609	-0.0809	-0.0769
		(0.127)	(0.158)	(0.201)	(0.195)
REIT CL Exposure (std.) x REIT Subsector Shock (std.)		0.165***	0.157***	0.183***	0.163***
		(0.0536)	(0.0465)	(0.0550)	(0.0505)
Non-REIT CL Exposure (std.)			0.270	0.273	0.254
			(0.238)	(0.237)	(0.237)
Non-REIT CL Exposure (std.) x REIT Subsector Shock (std.)			0.00561	-0.00692	0.0141
			(0.0599)	(0.0614)	(0.0597)
REIT TL Exposure (std.)				0.0253	0.0254
				(0.103)	(0.100)
REIT TL Exposure (std.) x REIT Subsector Shock (std.)				-0.0386	-0.0505**
				(0.0308)	(0.0242)
CRE Exposure (std.)					-0.259
					(0.318)
CRE Exposure (std.) x REIT Subsector Shock (std.)					0.236**
					(0.0909)
Constant	40.47***	40.07***	39.53***	39.57***	38.49***
	(7.787)	(7.830)	(5.985)	(5.994)	(6.179)
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 8: Real Effects of REIT CL Commitments in crisis

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. This table summarizes income statement items of banks to gauge the impact of REIT CL commitments during a crisis. Panel A shows the results for return on assets, Panel B shows the results for total assets, Panel C shows the results for net income, Panel D shows the results for operating revenue, and Panel E shows the results for loan loss provisioning. For all variables, except the return on assets, the logarithm is taken for scaling. Standard errors are clustered at the firm-level. All specifications include firm fixed effects and year-quarter fixed effects. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - Return on Assets

	(1) h=0	(2) h=1	(3) h=2	(4) h=3	(5) h=4
REIT CL Exposure (std.) x Crisis	-0.000348***	-0.000594**	-0.000689*	-0.000771	-0.000771
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)

Panel B - Total Assets

	(1) h=0	(2) h=1	(3) h=2	(4) h=3	(5) h=4
REIT CL Exposure (std.) x Crisis	0.00651**	0.0127***	0.0145**	0.0148*	0.0165
	(0.003)	(0.004)	(0.006)	(0.008)	(0.010)

Panel C - Net Income

	(1) h=0	(2) h=1	(3) h=2	(4) h=3	(5) h=4
REIT CL Exposure (std.) x Crisis	-0.0277*	-0.0485**	-0.0531*	-0.0582*	-0.0556
	(0.015)	(0.024)	(0.027)	(0.032)	(0.036)

Panel D - Operating Revenue

	(1) h=0	(2) h=1	(3) h=2	(4) h=3	(5) h=4
REIT CL Exposure (std.) x Crisis	0.00358	0.0126**	0.0156*	0.0195*	0.0221*
	(0.004)	(0.005)	(0.008)	(0.011)	(0.013)

Panel E - Loan Loss Provisioning

	(1) h=0	(2) h=1	(3) h=2	(4) h=3	(5) h=4
REIT CL Exposure (std.) x Crisis	0.0312**	0.0685***	0.0775**	0.0867**	0.0944**
	(0.015)	(0.023)	(0.031)	(0.035)	(0.046)

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. 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 unreported controls. Standard errors are clustered at the borrower-level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

	AISD (bps)	AISU(bps)	Commitment fee (bps)	TCB	Loan spread	RoE
	(1)	(2)	(3)	(4)	(5)	(6)
REIT	8.565	3.524**	0.457	-6.437	-24.06*	0.113
	(7.406)	(1.715)	(2.581)	(7.446)	(13.56)	(0.0975)
NBFI (Ex-REIT)	3.577	3.995***	3.152***	18.30***	14.46	-0.0156
	(5.200)	(1.243)	(1.079)	(4.366)	(14.13)	(0.131)
Maturity (months, std.)	-7.796***	-0.107	0.517	-24.14***	-3.946	0.0228
	(1.633)	(0.367)	(0.317)	(1.788)	(3.797)	(0.0255)
Loan Size ($ millions, std.)	-6.934***	-1.056***	-0.430*	-0.773	-3.789***	-0.106***
	(1.889)	(0.321)	(0.247)	(1.089)	(1.465)	(0.0368)
Financial Covenant	-12.88***	-1.816***	1.570***	-12.11***	-54.14***	-0.365***
	(2.175)	(0.462)	(0.500)	(1.765)	(5.668)	(0.0374)
SOFR linked	10.11	1.962	0.961	42.41***	0.611	-0.0504
	(9.895)	(1.797)	(1.611)	(8.667)	(25.24)	(0.183)
Firm Beta	14.37***	2.752***	1.289**	14.72***	23.54***	0.150***
	(2.378)	(0.479)	(0.504)	(2.135)	(6.013)	(0.0398)
Distance to Default	-1.018***	-0.210***	-0.155***	-1.100***	-1.419	-0.0116**
	(0.248)	(0.0533)	(0.0495)	(0.190)	(1.049)	(0.00488)
Secured facility	33.04***	8.677***	10.76***	33.25***	72.34***	0.703***
	(2.746)	(0.614)	(0.619)	(2.576)	(6.929)	(0.0632)
Constant	224.8***	31.87***	15.52***	166.9***	327.7***	2.421***
	(11.02)	(2.479)	(2.226)	(10.40)	(23.34)	(0.387)
Credit Line	Y	Y	Y	Y	N	N
Rating Group FE	Y	Y	Y	Y	Y	Y
Lender x Year-Quarter FE	Y	Y	Y	Y	Y	Y
Obs.	9,035	7,525	9,738	7,022	4,436	14,615
R^2	0.605	0.609	0.482	0.647	0.582	0.526

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 IA.A.11. 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

Table 11: 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
Debt/Equity	Long-term debt plus debt in current liabilities divided by stockholders' equity: $\frac{dlttq+dlcq}{seqq}$	Compustat

Variable Definitions - continued

Name	Definition	Source
Credit Line/Assets	Total credit line balance divided by total assets: $\frac{outstandingbalrrevolvingcredit}{atq}$	CapIQ + 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
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

Variable Definitions - continued

Name	Definition	Source
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
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
Maturity (months)	Maturity of the loan at origination in months [*tenor_maturity*]	DealScan

Variable Definitions - continued

Name	Definition	Source
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
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

Internet Appendix

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

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Manasa Gopal
Maximilian Jager
Sascha Steffen

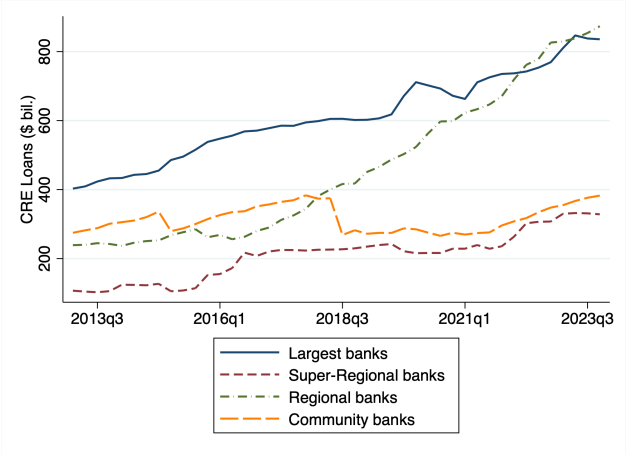
This version: October 6, 2025

A Additional Figures and Tables

Figure IA.A.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

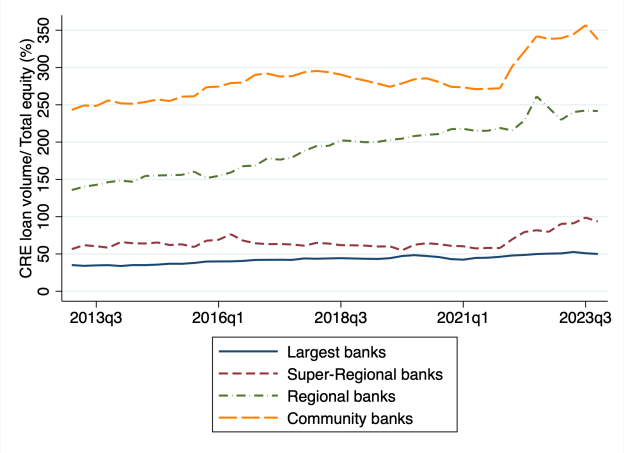


Figure IA.A.2: Banks' total exposure to CRE - 2023 Q4

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.

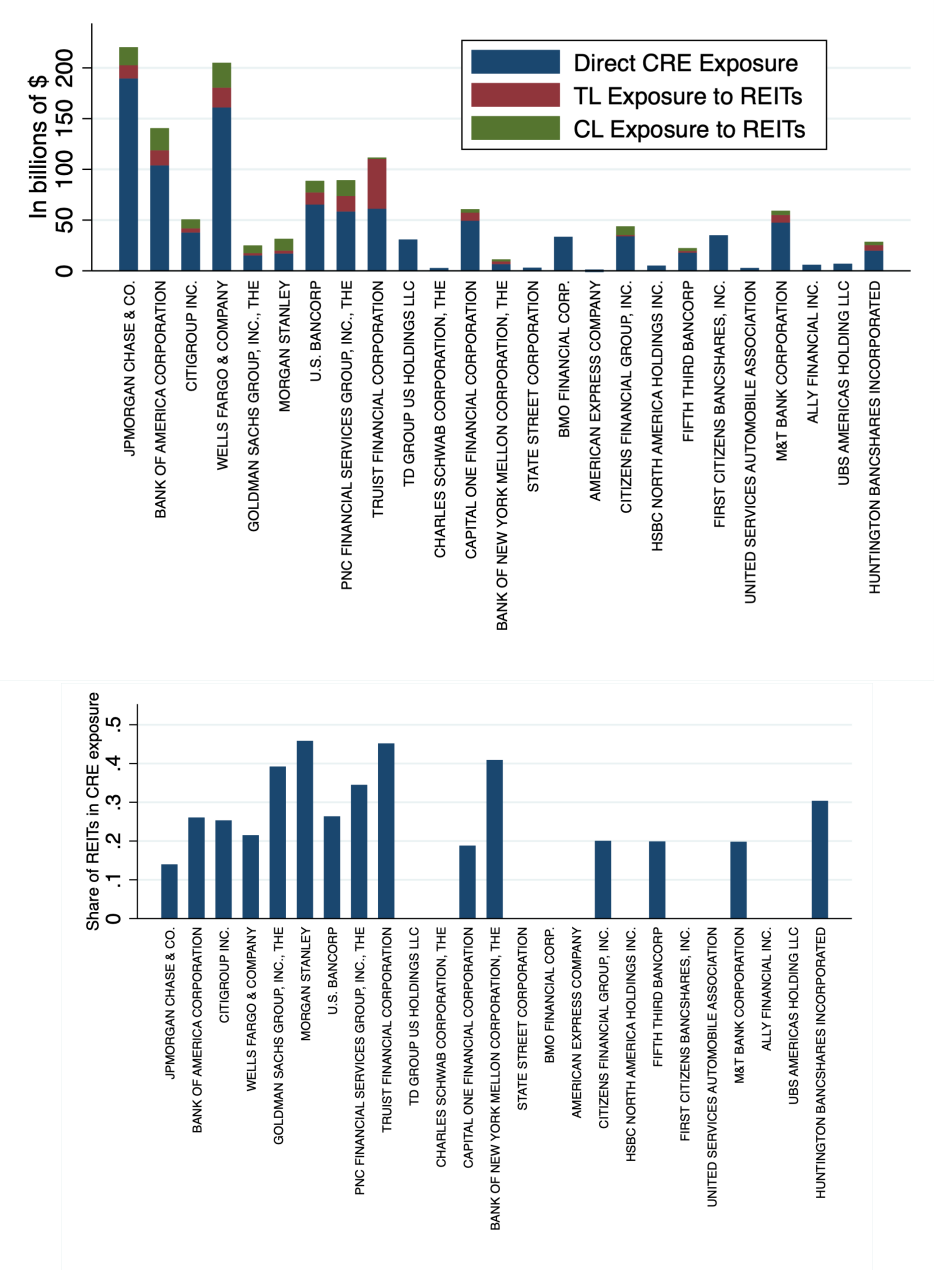


Figure IA.A.3: Banks' Exposure to Commercial Real Estate (CRE) by bank type

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), 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

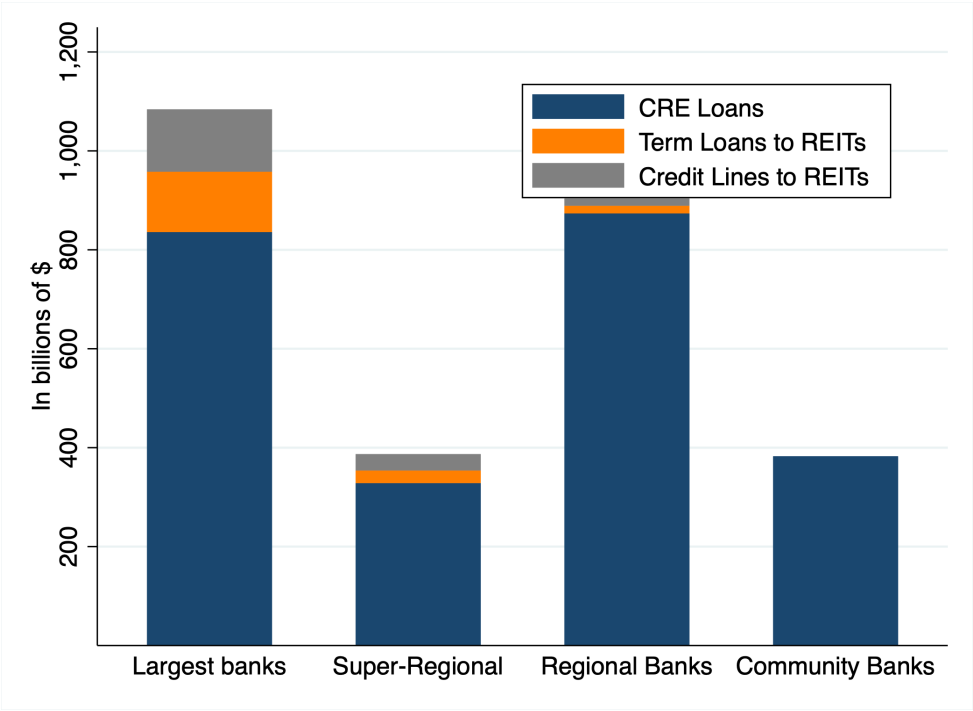


Figure IA.A.4: Banks' Exposure to Commercial Real Estate (CRE) by bank type

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.

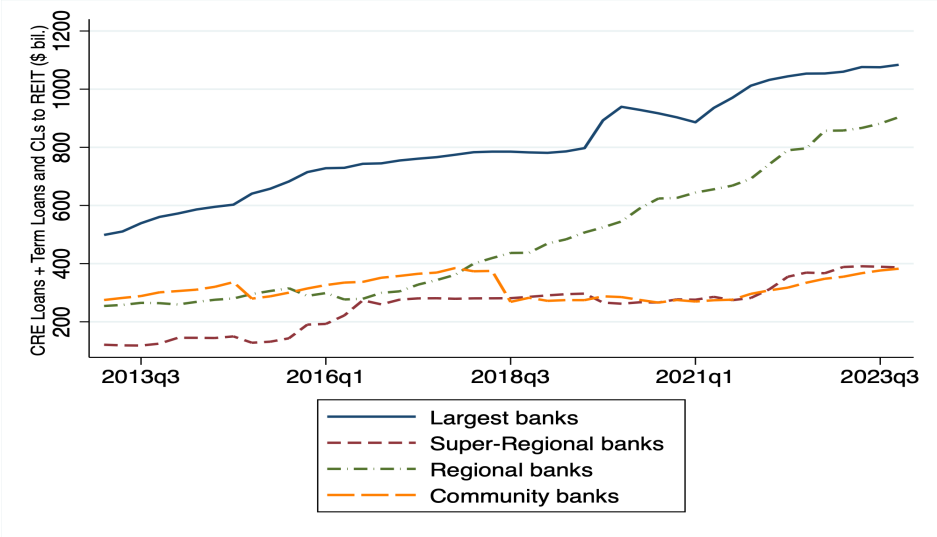
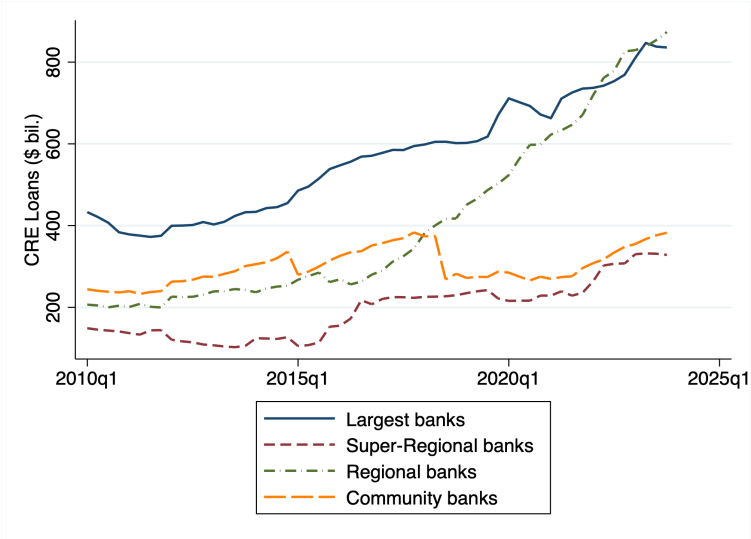


Figure IA.A.5: Commercial Real Estate (CRE) loans by bank type

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

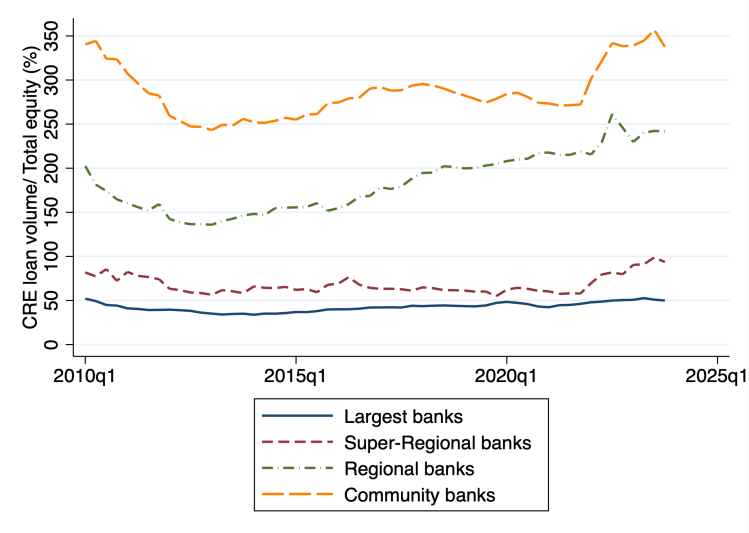


Figure IA.A.6: Banks' Term Loan and Credit Line Exposure to REITs - Scaled by Equity

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).

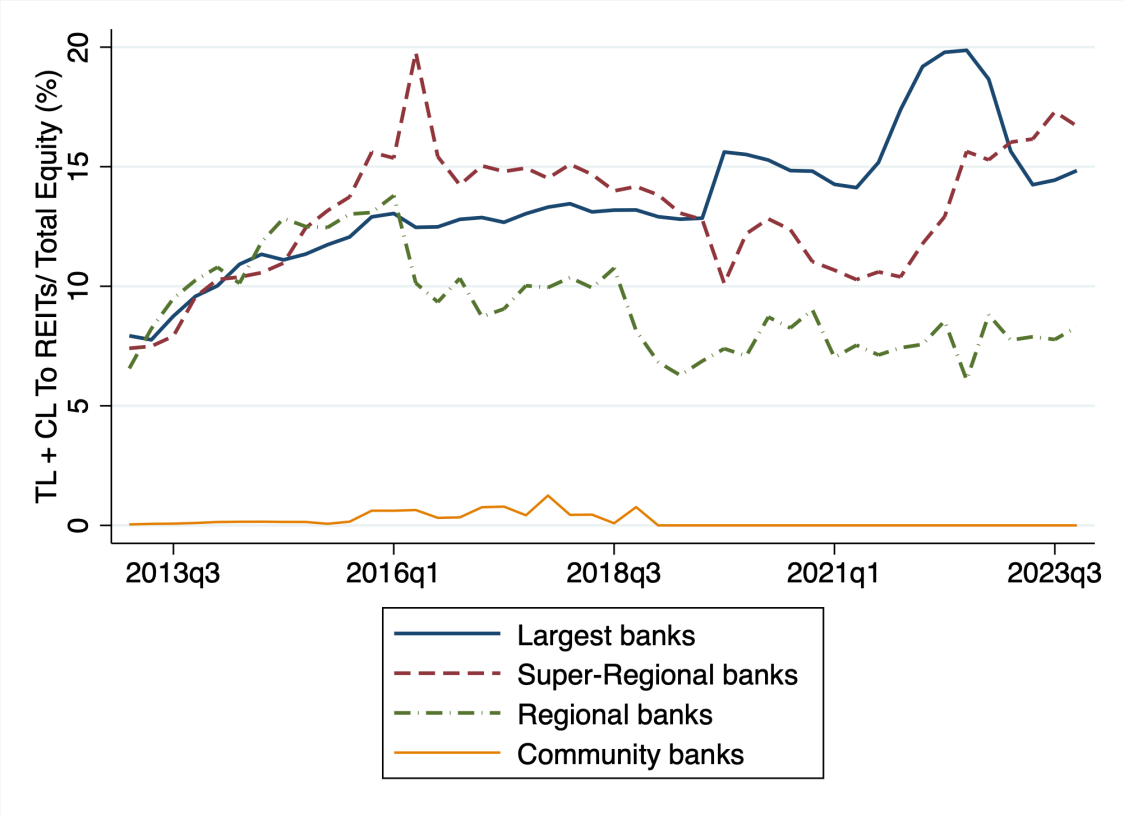
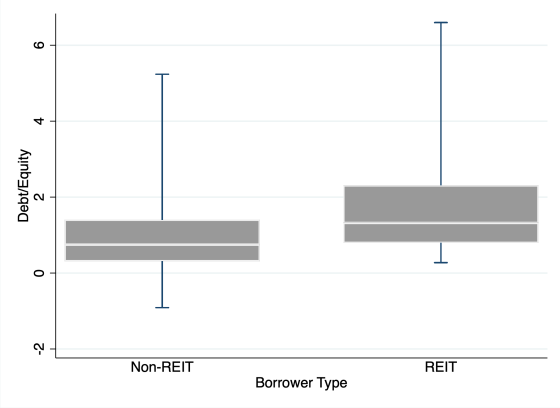
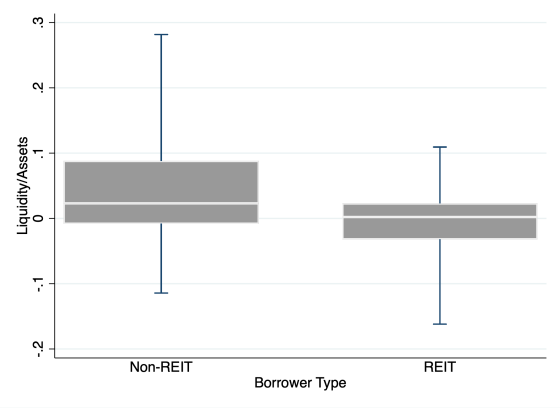


Figure IA.A.7: Comparing REITs to non-REITs

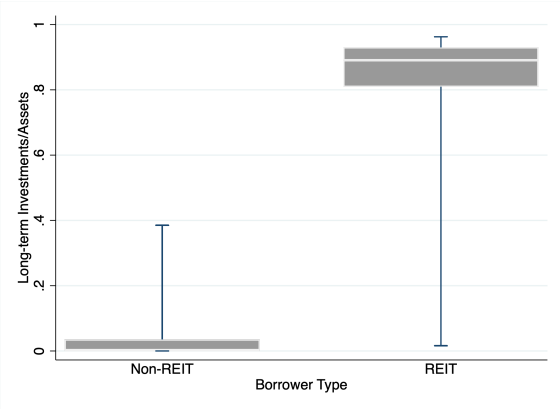
This figure compares the distribution of REIT and non-REIT financial characteristics. The box plots the 25th, median, and 75th percentile, while the caps denote the 5th and 95th percentile of the distribution. The distribution is based on the full sample between 2005 and 2023 and data is from Capital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



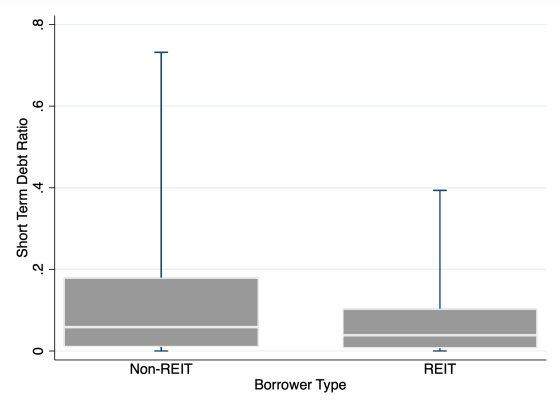
(a) Leverage



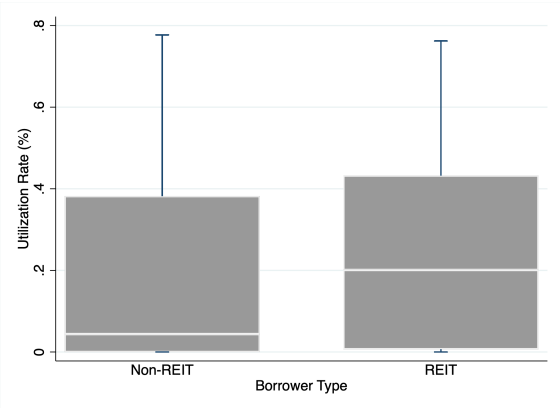
(b) Liquidity to Assets



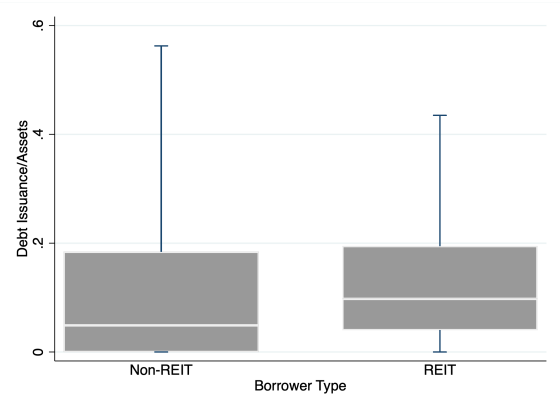
(c) Long-term Investments to Assets



(d) Short-term debt to Total Debt



(e) Credit Line Utilization Rate

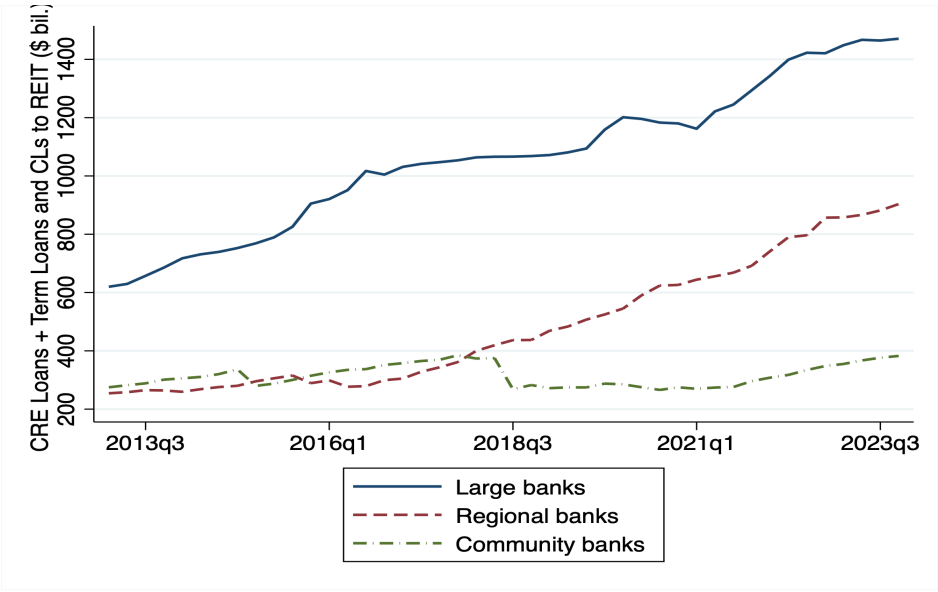


(f) Long-term Debt Issuance to Assets

Figure IA.A.8: 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

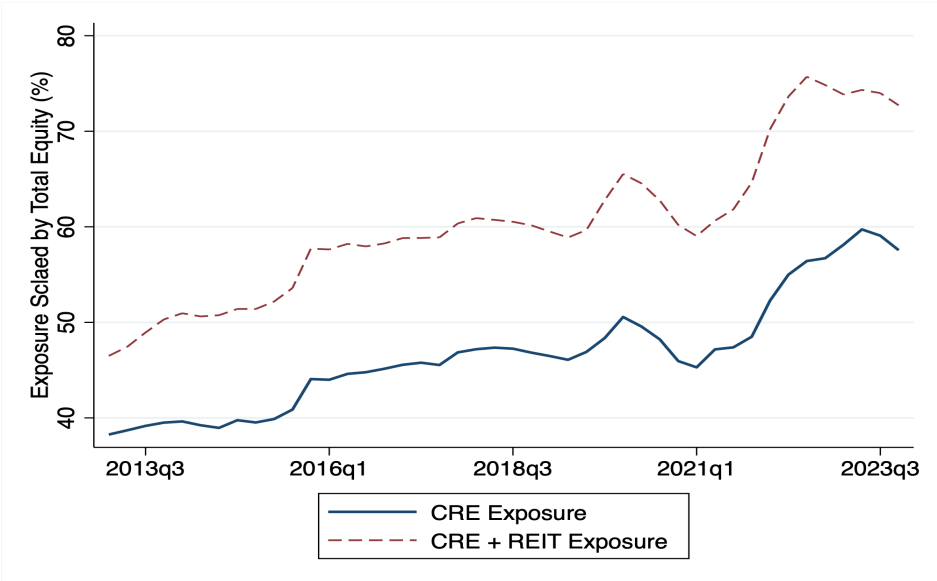
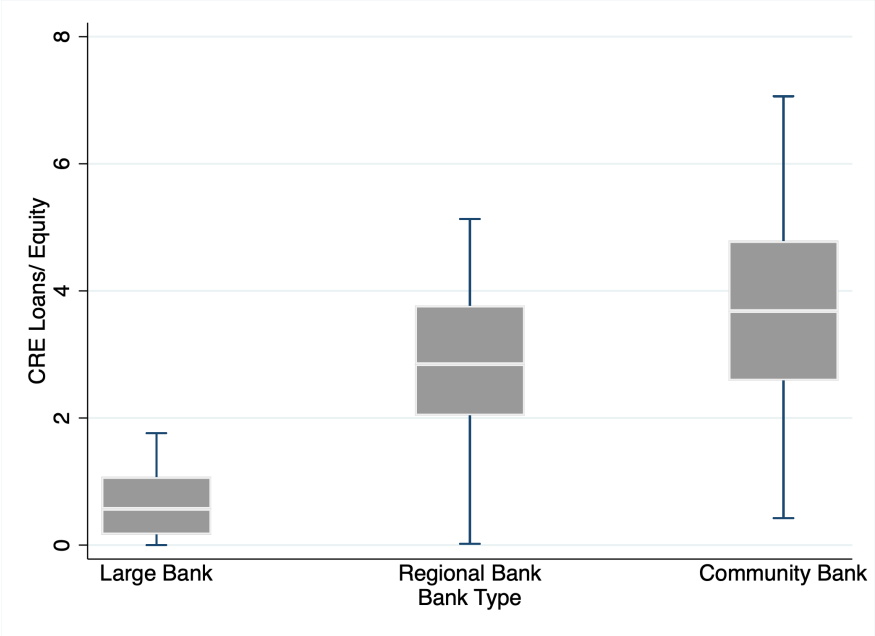
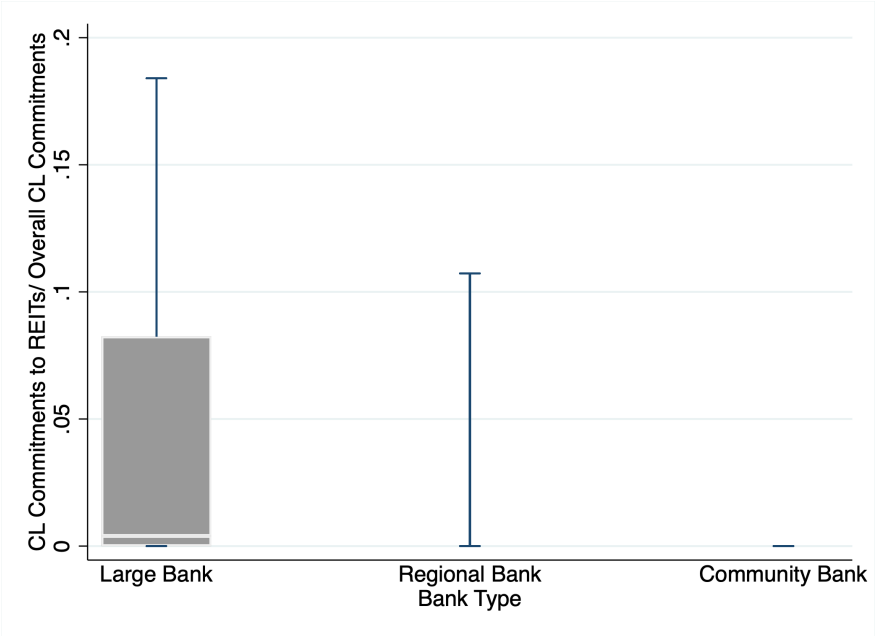


Figure IA.A.9: CRE exposure box plots by bank type

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

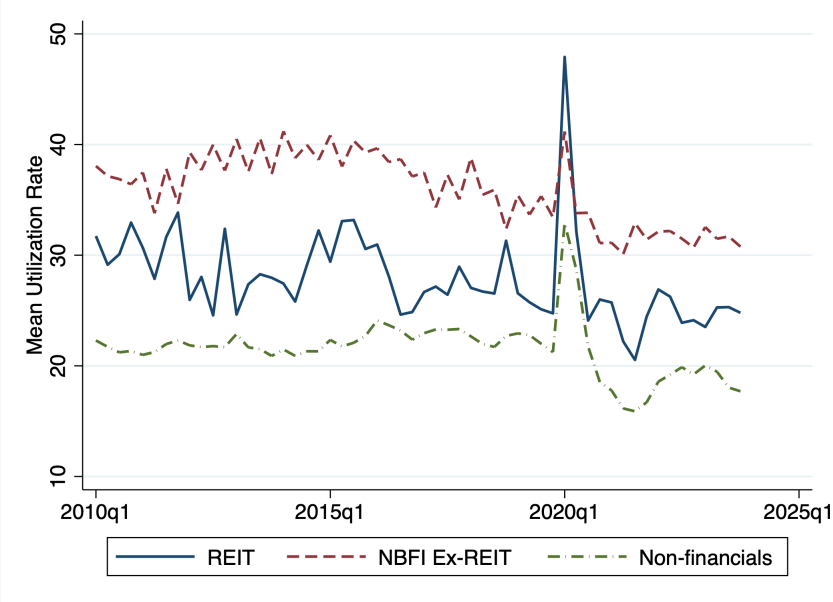


(b) Credit Lines to REITs/ Total Credit Lines

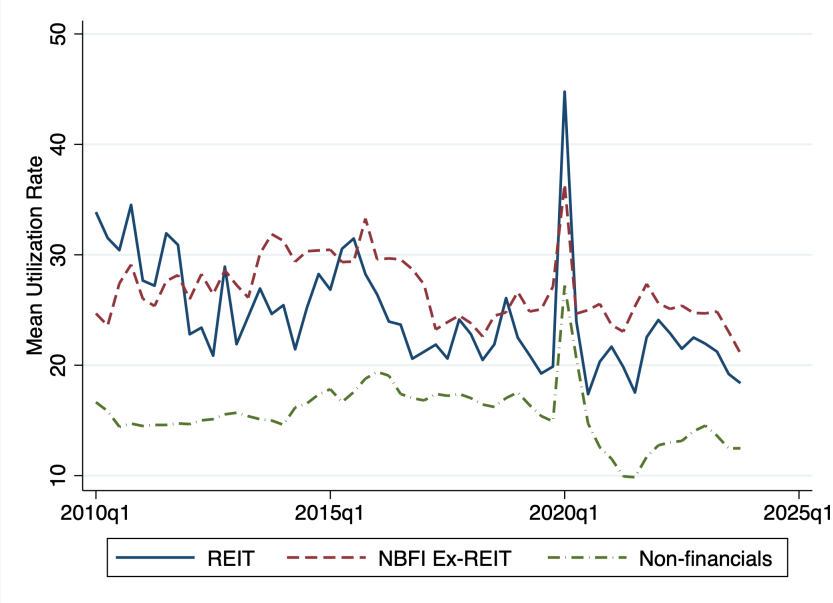
Figure IA.A.10: Credit line utilization rates by borrower category

This figure plots the equal-weighted (Panel A), total credit-line balance weighted (Panel B) and median (Panel C) 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 - Volume-weighted average



Panel C - Median

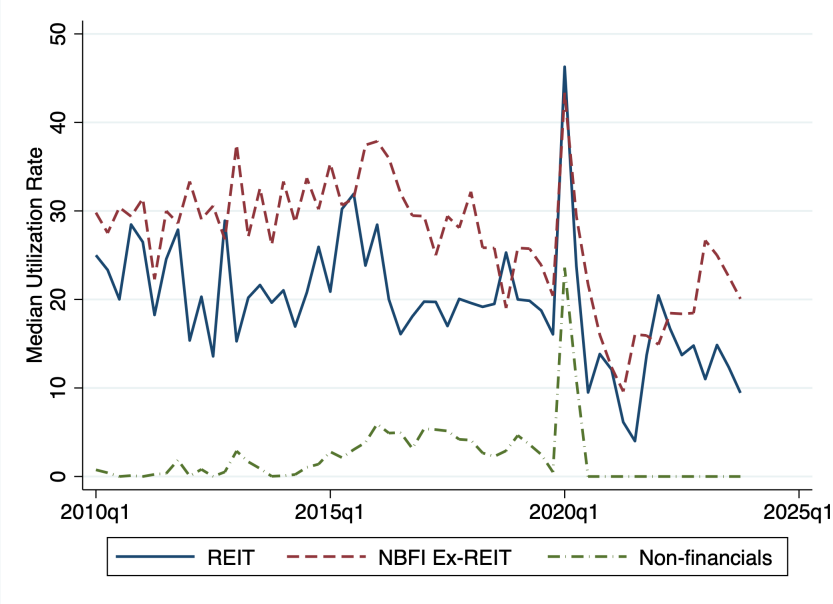


Figure IA.A.11: REIT Covid stock market performance by subsector

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.

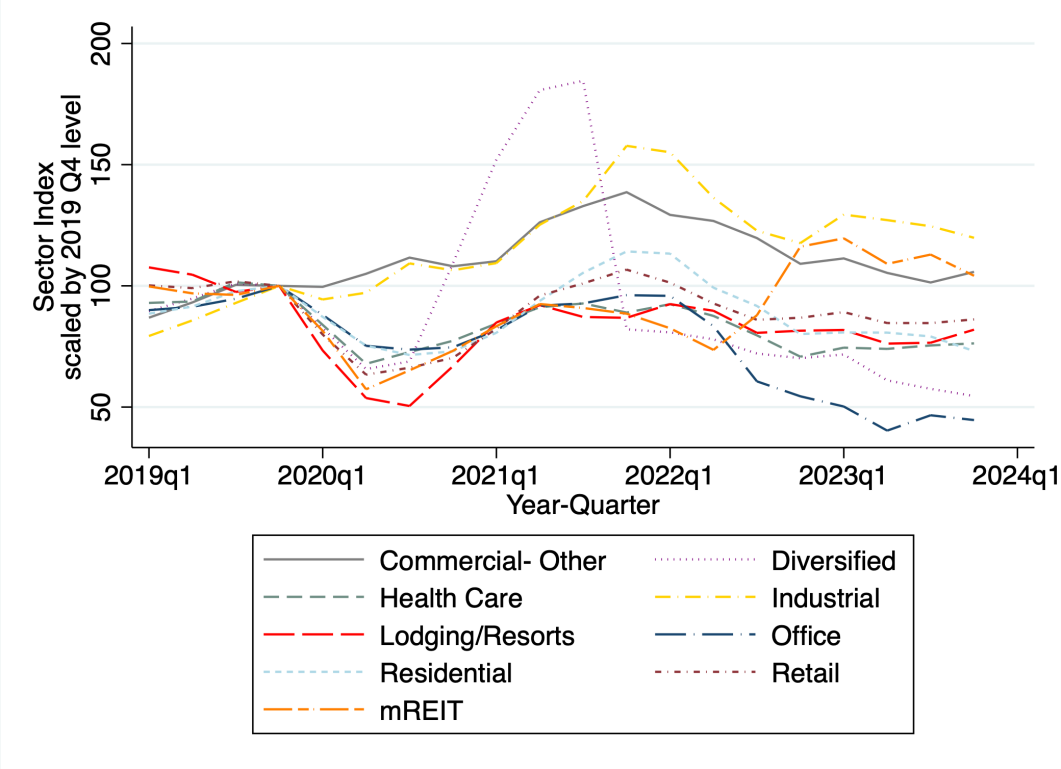
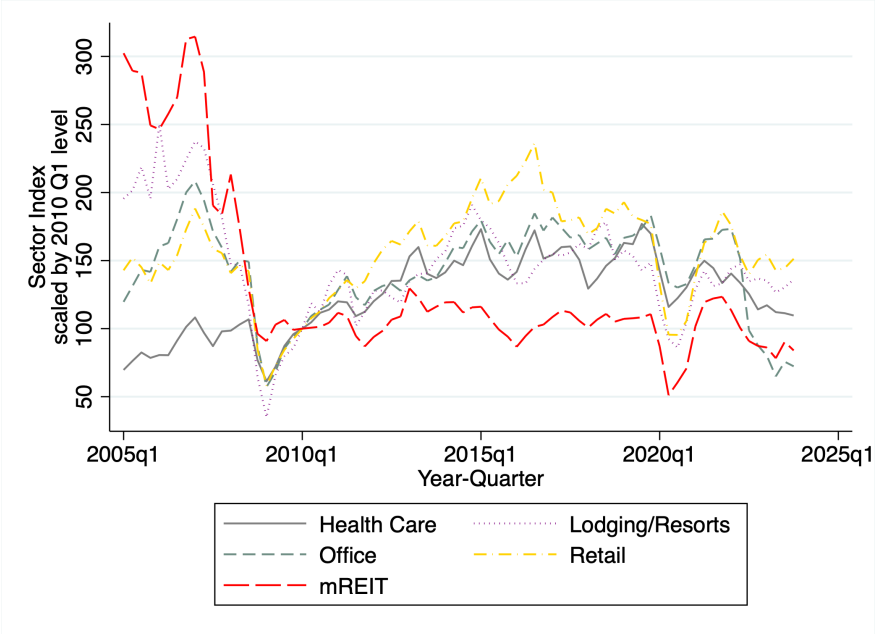


Figure IA.A.12: REIT long-term stock market performance by subsector

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

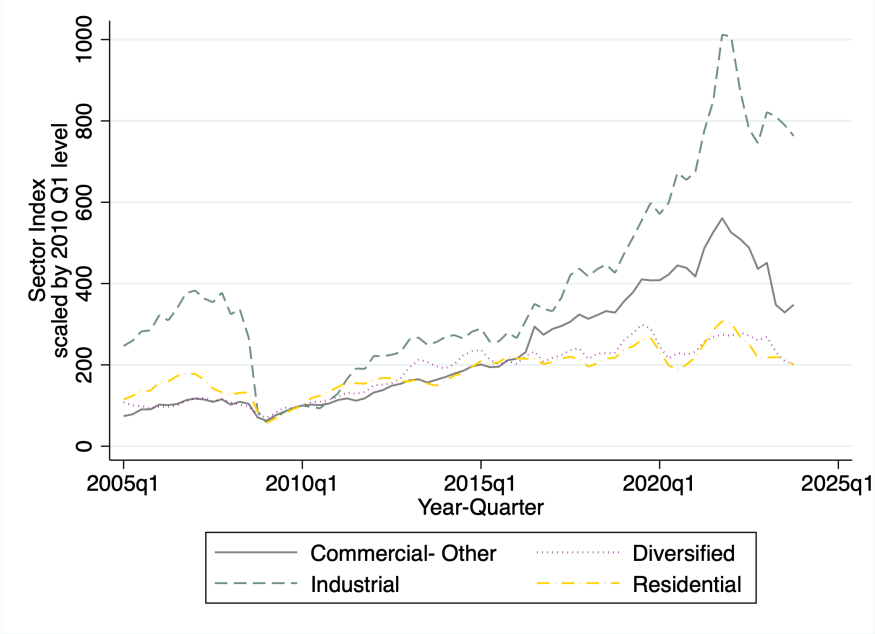
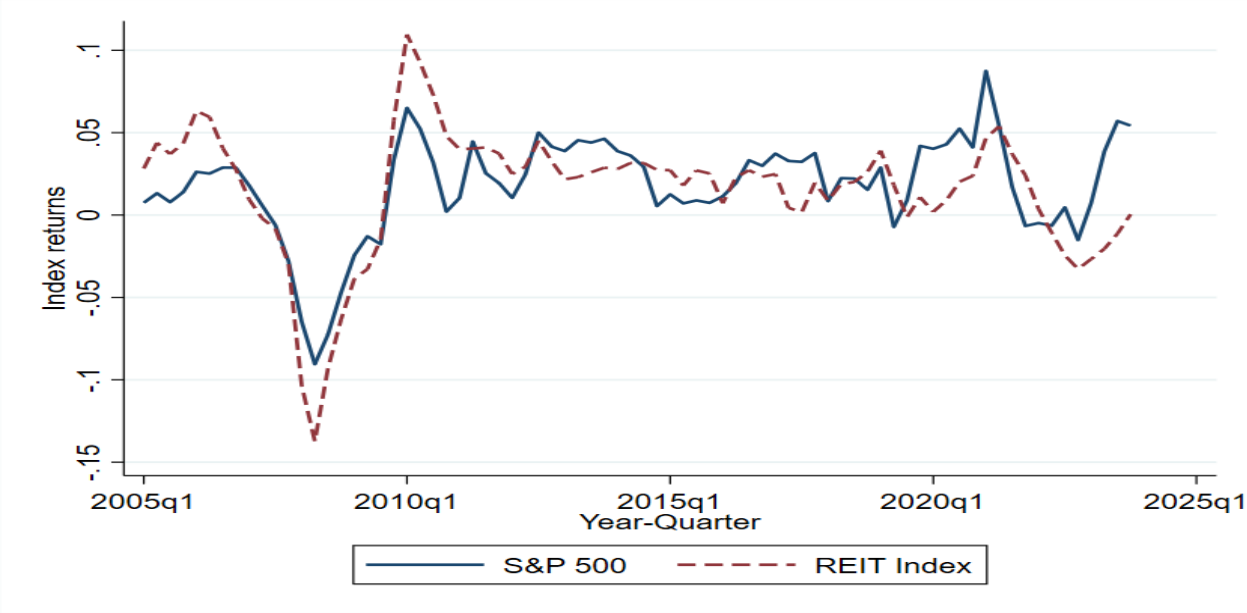


Figure IA.A.13: Co-Movement of the S&P 500 and REIT stock market performance

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

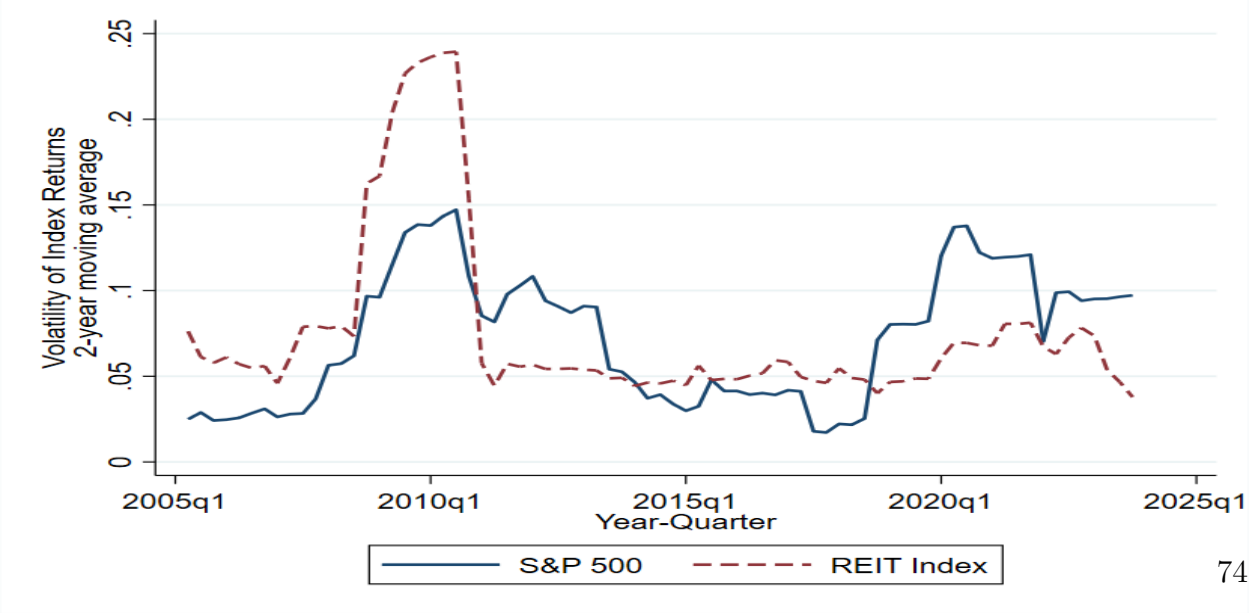


Figure IA.A.14: Incremental SRISK (market revaluation effect) relative to current market equity value

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

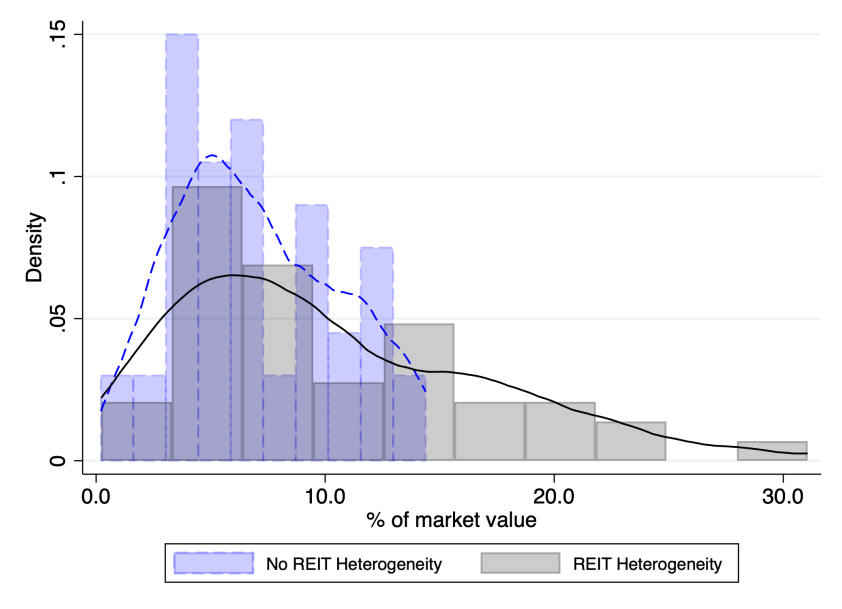


Figure IA.A.15: SRISK comparison bank-by-bank

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.

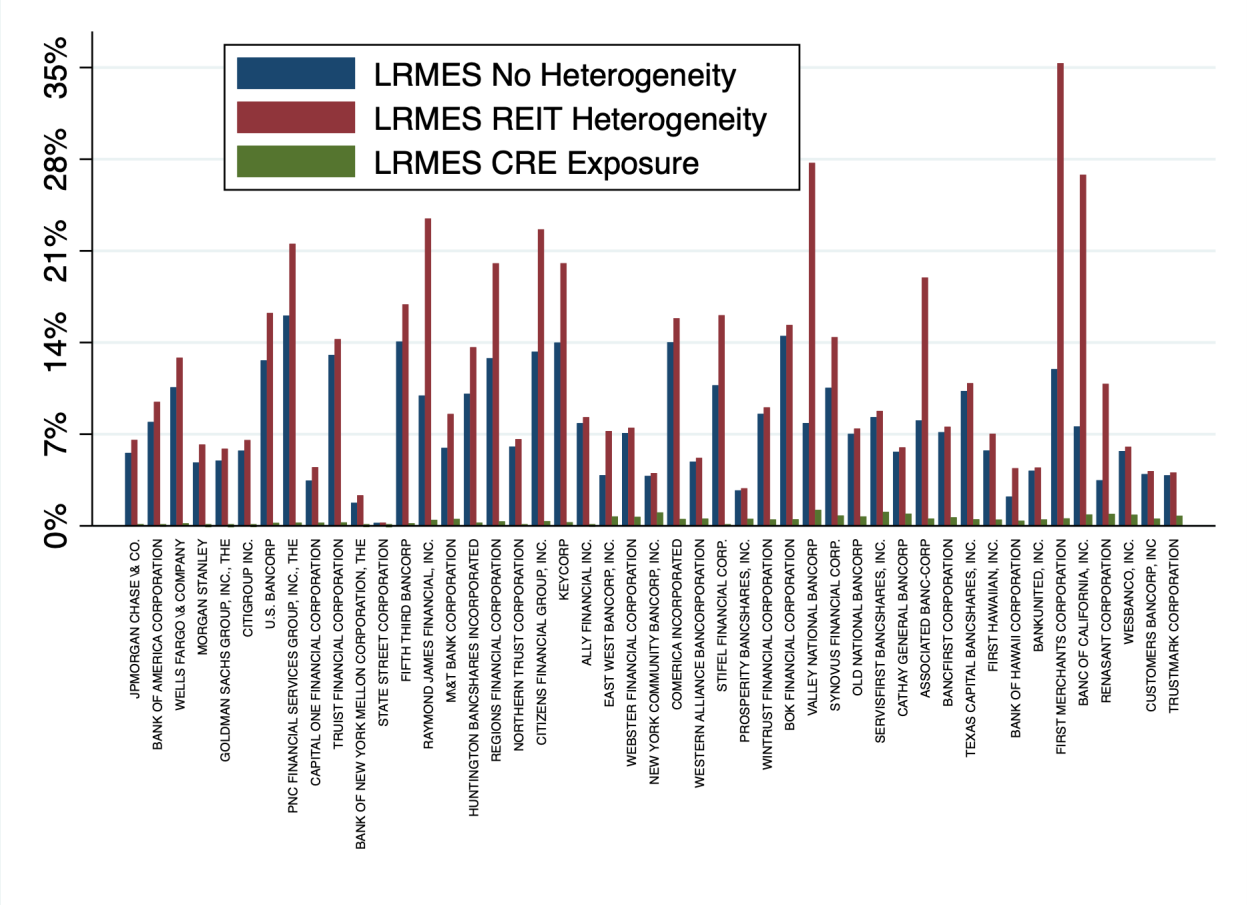


Table IA.A.1: Summary Statistics - Borrower and Loan Characteristics

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 IA.A.2: 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 Covenants	1.00	0.00	0.00
General Covenants	0.00	0.00	0.00
Observations	1228	1627	49710

Table IA.A.3: 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 IA.A.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 Covenants	0.75	0.36	0.54
General Covenants	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 Covenants	0.61	0.50	0.54
General Covenants	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 IA.A.4: 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. We split companies into three groups: REITs, non-financial firms, and NBFIs excluding REITs. The omitted group is non-financial borrowers. 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).

	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 IA.A.5: 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 IA.A.6: 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 IA.A.7: 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 IA.A.8: 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 IA.A.9: 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 IA.A.10: 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 IA.A.11: 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 IA.A.14 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 IA.A.12: 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

Table IA.A.13: Effect of REIT Exposure on Bank Stock Returns - channel

This table shows results of regressing bank stock returns on REIT credit line commitments scaled by total assets, total equity, and total liquidity as well as on the sub-sector return shock measure. The sample period is 2005Q1 to 2023Q4. Column (1) uses scaling by total assets, Column (2) uses scaling by total equity, Column (3) uses scaling by total liquidity, and Column (4) performs a horse race between the scaling by total equity and a scaling by total liquidity that was residualized from a regression with total equity to disentangle the two channels. 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)
REIT CL Exposure (std.)	-0.247*			
	(0.148)			
REIT Subsector Shock (std.)	-0.256	-0.256	-0.207	-0.259
	(0.173)	(0.176)	(0.161)	(0.176)
REIT CL Exposure (std.) x REIT Subsector Shock (std.)	0.187***			
	(0.0637)			
REIT CL Exposure (std.) - Capital		-0.329**		-0.318**
		(0.149)		(0.148)
REIT CL Exposure (std.) - Capital x REIT Subsector Shock (std.)		0.192***		0.195***
		(0.0654)		(0.0651)
REIT CL Exposure (std.) - Liquidity			-0.211	
			(0.142)	
REIT CL Exposure (std.) - Liquidity x REIT Subsector Shock (std.)			0.179***	
			(0.0660)	
REIT CL Exposure (std.) - Liquidity resid.				0.0213
				(0.194)
REIT CL Exposure (std.) - Liquidity resid. x REIT Subsector Shock (std.)				0.130
				(0.0973)
Constant	42.01***	42.77***	41.44***	42.57***
	(7.849)	(7.849)	(7.815)	(7.857)
Controls	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y
Time FE	Y	Y	Y	Y
Obs.	8,983	8,983	8,983	8,983
R^2	0.607	0.607	0.607	0.607

Table IA.A.14: 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 et al. (2023)) as control variables which we interact with a REIT dummy. 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).

	AISD (bps)	AISU(bps)	Commitment fee (bps)	TCB	Loan spread	RoE
	(1)	(2)	(3)	(4)	(5)	(6)
REIT	-44.43	2.112	5.414	10.87	-80.79	-0.874
	(31.47)	(5.973)	(7.902)	(24.23)	(60.33)	(0.612)
NBFI (Ex-REIT)	19.70	-1.281	1.200	4.396	-19.01	-0.336
	(14.41)	(3.732)	(4.107)	(13.56)	(41.22)	(0.463)
Maturity (months, std.)	-9.047***	-0.150	0.399	-24.84***	-3.603	0.0498
	(1.763)	(0.389)	(0.337)	(1.964)	(3.995)	(0.0509)
Loan Size ($ millions, std.)	-7.297***	-1.061***	-0.418	-0.998	-3.868**	-0.149***
	(2.041)	(0.346)	(0.261)	(1.103)	(1.535)	(0.0496)
Financial Covenant	-13.51***	-1.831***	1.655***	-12.10***	-55.88***	-0.676***
	(2.228)	(0.465)	(0.518)	(1.848)	(5.874)	(0.0748)
SOFR linked	9.812	1.873	0.959	42.28***	5.222	-0.211
	(9.974)	(1.806)	(1.627)	(8.589)	(25.57)	(0.402)
Firm Beta	15.06***	2.735***	1.250**	14.74***	24.51***	0.274***
	(2.506)	(0.509)	(0.524)	(2.233)	(6.288)	(0.0807)
Distance to Default	-1.004***	-0.222***	-0.156***	-1.128***	-1.685	-0.00861
	(0.251)	(0.0546)	(0.0514)	(0.193)	(1.066)	(0.0122)
Secured facility	32.92***	8.663***	10.97***	33.04***	72.67***	0.959***
	(2.891)	(0.643)	(0.635)	(2.687)	(7.230)	(0.109)
REIT x Maturity (months, std.)	-10.90	-0.691	3.617	9.593	1.491	-0.161
	(8.972)	(2.314)	(2.526)	(8.193)	(12.25)	(0.152)
REIT x Loan Size ($ millions, std.)	6.830	-0.359	1.829	5.837	3.502	0.116
	(6.370)	(0.855)	(2.028)	(3.794)	(27.56)	(0.346)
REIT x Financial Covenant	1.310	0.00775	-1.774	-0.502	26.38	0.468
	(12.36)	(2.350)	(3.400)	(11.03)	(31.36)	(0.420)
REIT x SOFR linked	31.40*	7.244***	4.023	7.791	35.23	0.359
	(16.94)	(2.725)	(5.395)	(21.67)	(29.30)	(0.476)
REIT x Firm Beta	41.38*	1.171	0.902	-20.39	14.34	0.219
	(22.69)	(3.866)	(5.240)	(15.36)	(38.68)	(0.392)
REIT x Distance to Default	3.871	0.251	-0.847	-0.886	-8.570	-0.0935
	(4.781)	(0.858)	(0.988)	(2.667)	(9.059)	(0.124)
REIT x Secured facility	18.14	-7.310**	-15.87***	-7.566	-22.72	-0.174
	(18.45)	(3.630)	(5.657)	(15.43)	(53.67)	(0.562)
REIT x All As	11.08	1.871	1.096	4.741	4.144	-2.986**
	(18.23)	(4.136)	(6.316)	(20.93)	(103.0)	(1.422)
REIT x BBB	-22.33	-2.170	-8.468	-2.228	47.75	0.162
	(15.25)	(3.440)	(5.363)	(11.46)	(39.19)	(0.513)
REIT x NonIG	4.714	3.910	4.070	22.04	51.80	0.900*
	(23.67)	(5.088)	(6.317)	(19.19)	(50.06)	(0.533)
Constant	224.6***	31.62***	15.48***	167.5***	324.1***	2.491***
	(11.05)	(2.472)	(2.250)	(10.54)	(23.69)	(0.522)
Credit Line	Y	Y	Y	Y	N	N
Rating Group FE	Y	Y	Y	Y	Y	Y
Lender x Year-Quarter FE	Y	Y	Y	Y	Y	Y
Obs.	9,035	7,525	9,738	7,022	4,436	4,436
R^2	0.607	0.611	0.484	0.648	0.585	0.579

Table IA.A.15: 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 and https://fred.stlouisfed.org/series/DRCRELEXFACBS.

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: treated as corporate exposure with higher PD estimates (2.5%) SA: treated as unrated non-financial corporate exposure"	"Credit Conversion Factor 20% for maturity less than one year. Credit Conversion Factor 50% for maturity of more than one year."	10% outflow assumption

B Why Do Large Banks Lend to REITs?

Why are large banks more engaged in lending to REITs than small or medium-sized banks, both through term loans and credit lines, while the reverse holds true for on-balance sheet commercial real estate (CRE) lending? See Figure IA.B.1 for recent trends in CRE exposure of large and small banks. Panel A shows the total lending by banks to the commercial real estate sector (which includes on and off balance sheet loans backed by commercial real estate including loans to REITs). The smallest banks have grown their commercial real estate exposure significantly in the last two decades. However, we note that unlike commonly assumed, the largest banks have not decreased their overall lending to CRE. In fact, their lending has remained extremely stable over the last two decades. What is interesting, however, is that their commercial real estate exposure has been shifting more towards REITs, as shown in Panel B. Particularly, between 2010 and 2013, the largest banks saw a large jump in REIT share of total lending to the commercial real estate sector. In this section, we propose four mutually reinforcing explanations for this trend.

Regulation. Regulators typically view property-level CRE loans as riskier, more cyclical, and harder to diversify, so they impose higher capital charges. REITs, by contrast, resemble financial institutions or corporates with diversified, transparent balance sheets giving them lower weights. Let us explain.

In the US, under the current regulation, on-balance sheet CRE exposure is treated identical to unrated corporate exposures except for some special cases. As Table IA.A.15 highlights, this means that for a bank that uses the standardized approach the regulatory risk weight will be 100% for a commercial real estate loan and 75% for an exposure to a BBB-rated REIT (the most common rating category in our sample). This gives a regulatory advantage of 25%. So the simple fact that REITs have credit ratings — and CRE loans do not — makes them less capital intensive. This advantage only kicked in after the Basel II package was implemented in the US around the GFC. Pre-GFC there was no relevant regulatory differential in line with limited substitution towards REITs at that time.

Under the internal-ratings based (IRB) approach, the gap is even larger. Here, risk weights are determined by banks' own estimates of probabilities of default. In this framework, REIT exposures typically attract lower risk weights than property-level CRE loans because (a) their portfolios are diversified across properties, (b) they operate as going concerns with

multiple income streams, stronger liquidity management, and access to capital markets, and (c) as publicly listed firms, they provide transparent financial disclosures. Regulatory Pillar 3 reports confirm this pattern: banks applying internal models assign, on average, 40–60% lower risk weights to REIT exposures compared to CRE loans.[29] This reflects the perception of REITs as diversified, transparent financial institutions, while CRE loans remain idiosyncratic, collateral-dependent, and subject to concentration risk. Consequently, lending to REITs consumes substantially less regulatory capital than financing individual properties, under the IRB. Since large banks are significantly more likely to use internal models they obtain a higher regulatory advantage from lending to REITs compared to issuing CRE loans.

On top of this differential treatment for on-balance sheet exposures, off-balance sheet commitments to REITs require less capital than on-balance sheet CRE loans even if the (internal) rating and, thus, the risk weight are identical. This provides an additional reason for banks, if they want/have to economize on scarce equity capital, to substitute away from on-balance sheet CRE loans to credit line commitments to REITs.

Concentration in credit lines. The second explanation stems from the extreme size concentration of the credit line business. The largest 10 banks account for 79% of all credit line commitments, and the top 50 cover 99% of the market.[30] This dominance reflects structural advantages in liquidity provision: large banks have broader and more stable funding bases, including significant wholesale deposits and capital markets access, which allow them to underwrite large, revolving facilities. In periods of stress, they are also more likely to experience "flight-to-safety" inflows, to access central bank liquidity facilities at scale, and to benefit disproportionately from quantitative easing programs given their larger holdings of marketable securities. As a result, they are uniquely positioned to absorb the contingent liquidity risk that comes with credit lines.

For REITs, which are heavy users of revolving credit facilities to manage liquidity and bridge access to bond markets, these characteristics make large banks the natural lenders of choice. Smaller and medium-sized banks, by contrast, generally lack the balance sheet capacity and reliable funding channels to extend multi-hundred-million-dollar credit lines,

[29] As an example see the disclosure by Lloyds Bank for 2024: https://www.lloydsbankinggroup.com/assets/pdfs/investors/financial-performance/lloyds-banking-group-plc/2024/q4/2024-lbg-fy-pillar-3.pdf. We show UK data as an example because in the US, the granularity of exposure types in the disclosure of risk weights is lower.

[30] These numbers are based on Call Report data.

and the concentration risk of committing such a facility would be prohibitive. Thus, because the credit line business overall is concentrated at the very top of the banking system, the underwriting of REIT facilities is almost by definition concentrated there as well.

Scale. The third explanation is also size-based, but focuses on REITs as a borrower class. As Table IA.A.2 indicates, REITs are large even for publicly listed borrowers with a median loan size of 415 million USD (105 million USD for public non-financials) and a median balance sheet of 3.2 billion USD. Borrowers of this scale require credit facilities that are well beyond the comfortable exposure/concentration limits of small and medium-sized banks, and even if feasible, they would quickly breach regulatory thresholds. Even if small/ medium sized banks were willing to extend facilities of this magnitude, the loans would create outsized single-borrower concentration risk, tying up large portions of their regulatory lending capacity in a single name.

Moreover, the structural features of REIT borrowing further reinforce this divide. REITs typically rely on large, programmatic facilities rather than one-off project financing.[31] Their demand is therefore for long-term banking partners capable of repeatedly deploying hundreds of millions in liquidity on short notice, something only the largest banks can credibly commit to. For example, a 1999 Chicago Fed study noted that by the late 1990s nearly all publicly traded REITs had established syndicated bank credit lines or revolvers, averaging 35% of book assets, some as large as $1.25bn.[32] These were integral to REIT funding models: used to quickly finance acquisitions and development, then refinanced with bonds or equity because REITs cannot retain earnings (95% must be distributed). Utilization rates were material, with average usage over 42%. In normal times, facilities were treated as "commitments" rather than funded loans, but in stress episodes utilization could spike, suddenly increasing banks' real CRE exposure. Smaller banks, better suited to granular, project-level real estate lending, find themselves naturally excluded from this borrower segment.

Cross-selling. Large banks can also layer in ancillary services—bond underwriting, securitization, derivatives, and market-making—that make the overall client relationship profitable even if loan spreads are thin. Case in point, between 2004–2013, REITs executed 447 equity

[31] In 2009, Fitch cautioning that while rating agencies traditionally assumed REIT credit facilities would roll over, in crises this assumption might not hold, forcing downgrades.

[32] Decker and Lemieux (1999) points to Consider when Financing REITs, FRB Chicago.

issuances, 171 bond issues, 249 loans, and 379 dual-instrument financings.[33] These services have also become more important off late. According to Nareit, U.S. REITs raised $15.8bn in secondary equity in 2024 (plus $6.1bn in IPOs) and issued $48.1bn in secondary debt, up from $29.4bn in 2023.[34] Anecdotes highlight how the same banks that provide credit lines also underwrite debt and equity markets for REITs, reinforcing relationship banking and entrenching large banks' dominance.[35]

Small bank concentration in CRE. For smaller banks, the inability to diversify exposures of this magnitude means they would either be forced to decline the business or participate only in very small syndicate shares, limiting their economic role in REIT lending. At the same time, this scale mismatch creates a natural opportunity space for smaller banks in direct commercial real estate lending. Property-level CRE loans typically involve far smaller commitments, often in the range of a few million to a few tens of millions of dollars, which better fit the balance sheet capacity and risk tolerance of local or regional institutions. These loans also tend to carry higher margins than the low-spread, investment-grade REIT facilities that large banks dominate. Combined with strong local knowledge and long-standing relationships with developers, this allows small and medium-sized banks to specialize in granular, higher-yielding CRE exposures while leaving large, capital-markets-oriented REIT financing to the largest institutions.[36]

Goldman Sachs estimates that banks with $<$ \$250 bil. in assets originate ≈80% of CRE loans. Fitch describes this as a natural outcome: as large banks shifted into scale businesses (residential mortgage, credit cards), smaller banks were left with CRE and C&I lending as their core franchises.[37] Media reports echo this dynamic:

"To differentiate themselves from the nation's largest banks, smaller, regional banks tend to emphasize building relationships with local businesses and customers, giving them a unique and deep understanding of the local economies they operate in." - CNN Business, Feb 2024, via KTVZ.

[33] See Manda (2024)

[34] See - https://www.reit.com/news/blog/market-commentary/reits-raised-125-billion-through-secondary-offerings-ipos-2024-q4

[35] See for example, underwriting agreements of Prologis, the world's largest industrial REIT.

[36] FDIC research highlights the reliance of small banks on a relationship-based, community lending model. Source - https://www.fdic.gov/resources/community-banking/report/2020/2020-cbi-study-execsumm.pdf

[37] Source - https://www.cnn.com/2024/02/29/business/regional-banks-cre-exposure-explainer

CRE Daily notes that these banks rely on local expertise and are stepping in as large banks retrench from CRE under regulatory pressure. *"With big banks pulling back from CRE due to regulatory scrutiny, market volatility, and economic uncertainty, community banks and credit unions are stepping in."*[38]

Suggestive Evidence. Overall, there seem to be multiple potential reasons that explain the current market structure wherein smaller banks are dominant in on balance sheet CRE lending, while larger banks have indirect exposure to CRE through REITs. While nailing down the exact mechanism for why large banks made this shift is beyond the scope of this paper, we provide some suggestive evidence for these channels in Table IA.B.1 and IA.B.2. Firstly, in IA.B.1, we study which banks substituted to REITs by increasing their credit line commitments to REITs while reducing direct on balance sheet CRE exposures, and when this substitution happens. Panel A of Table IA.B.1 shows that between 2000Q1 to 2009Q3, we see a bit of substitution in community banks but large banks seem to "double down" by investing both on-balance sheet and off-balance sheet into CRE. Thus, pre-GFC, large banks were heavily invested in all forms of CRE. Between 2009Q4 to 2016Q4 (Panel B), however, banks increase REIT exposure by substituting away from direct CRE lending. The substitution is most pronounced for the largest US banks. In Panel C, we see that between 2017Q1 to 2022Q4, regional banks are increasing their exposures in both CRE and REIT lending. Thus, the bulk of the substitution happens in that immediate aftermath of the GFC, and for the largest US banks.

In Table IA.B.2, we explore the reasons for the substitution from direct on balance sheet CRE lending to REIT lending in the post-GFC period. Unsurprisingly, banks that have a larger share of credit line commitments, irrespective of size, also do greater credit line lending to REITs. The magnitude of the effect is greatest for the very largest of US banks. We also note that banks that do more underwriting activities are also the ones doing greater shares of credit line commitments to REITs. This effect is, perhaps, not surprisingly, concentrated among the biggest banks. Among the large banks, we also see that the banks with lower equity levels are more likely to have larger REIT exposures relative to on-balance sheet exposures. Since off-balance sheet commitments require lower levels of equity to finance, and there have been sizeable advantages of using internal models, as large banks tend to do, in

[38]Source - https://www.credaily.com/briefs/community-lending-gains-ground-as-cre-giants-retreat/

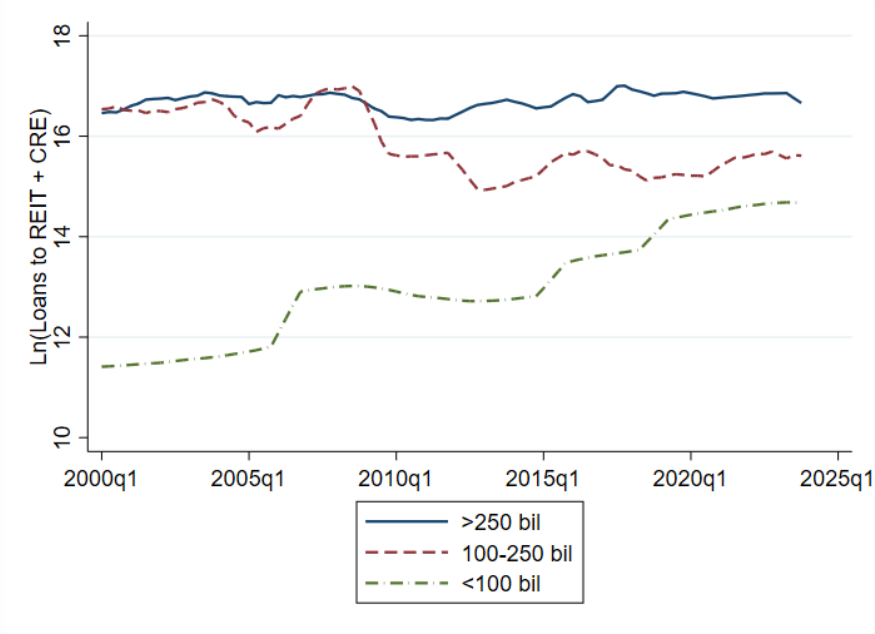
the 2009 to 2013 period, it is to be expected that those banks with lower equity levels tend to favor the REIT CL channel of exposure to commercial real estate.

Thus, we see that indirect CRE exposure through REITs concentrates at large banks due to regulatory advantages, business model differences, and economies of scale. Smaller banks, in turn, remain central to property-level CRE finance, where their comparative advantages lie. The central argument in this paper, however, is that this structure has systemic implications. Specifically, REITs rely heavily on short-term credit lines and capital markets to refinance. In times of stress, this funding can dry up quickly, creating rollover risk. Second, REIT valuations and borrowing capacity are tightly linked to real estate prices and market sentiment, so downturns can trigger simultaneous losses and liquidity strains. While diversified across properties, REITs remain exposed to broad real estate cycles – particularly since REITs tend to be concentrated in one sector (office, warehouses, etc.), which undermines diversification. Furthermore, concentration among the largest banks introduces potential systemic risks. Because REIT credit lines are concentrated at a handful of large banks, downturns can generate correlated stress: as REITs draw on their facilities, liquidity demands increase precisely when financial conditions are most fragile. Thus, the very factors that make large banks the natural counterparties for REITs also embed systemic vulnerabilities into the financial system.

Figure IA.B.1: Commercial Real Estate Lending Over Time

This figure plots the total commercial real estate lending (Panel A) and share of lending to REITs (Panel B) over time across various bank group sizes. In Panel A, we measure total commercial real estate lending as the sum of on and off-balance sheet lending to firms backed by commercial real estate as well as REITs. This is calculated as a sum of term loan and credit line exposure to REITs, the on balance sheet CRE exposure (all described in Section 3), as well as sum of call report items BHCK3816 - *commercial real estate, construction, and land development: commitments to fund loans secured by real estate* and BHCK6550 - *commercial real estate, construction, and land development: commitments to fund loans not secured by real estate*. In Panel B, we measure the credit lines and term loans to REITs as a share of total commercial real estate lending.

Panel A - Total CRE Lending



Panel B - REIT Share of CRE Lending

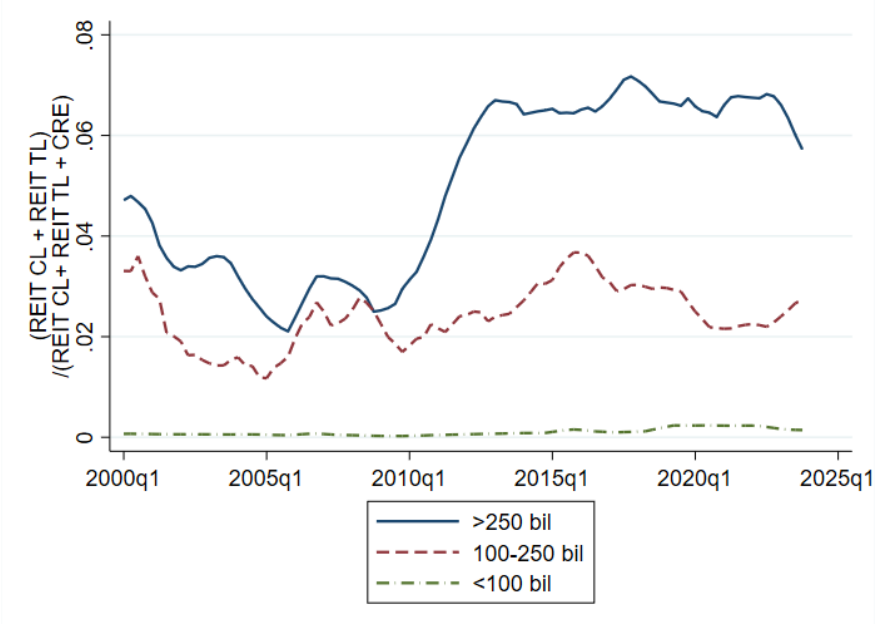


Table IA.B.1: Patterns CRE vs REIT CLs

The table presents results from regressing credit line commitments to REITs (scaled by total assets) on on-balance sheet CRE exposure (scaled by assets). The coefficients allow to estimate the substitution intensity between the two exposures. Column (1) shows the results for all banks, Column (2) for banks larger than 250 USD billion in total assets, Column (3) for banks larger than 100 USD billion in total assets, Column (4) for banks larger than 10 USD billion in total assets, and Column (5) for banks smaller than 10 USD billion in total assets. The sample period for Panel A is 2000Q1 to 2009Q3, for Panel B 2009Q4 to 2016Q4, and for Panel C 2017Q1 to 2022Q4. Standard errors are clustered at the bank level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A - 2000Q1 to 2009Q3

	REIT CL Commitments over Assets				
	(1)	(2)	(3)	(4)	(5)
CRE Exposure / Assets	-0.00126***	0.0262*	0.0188	0.0000566	-0.000527***
	(0.000123)	(0.0146)	(0.0114)	(0.00165)	(0.000104)
Controls	Y	Y	Y	Y	Y
Bank Group	All	Very Large	Large	Regional	Community
Bank FE	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y
Obs.	46,565	327	354	2,041	43,837
R^2	0.464	0.801	0.840	0.555	0.389

Panel B - 2009Q4 to 2016Q4

	REIT CL Commitments over Assets				
	(1)	(2)	(3)	(4)	(5)
CRE Exposure / Assets	-0.00119***	-0.0366***	-0.0421***	0.00140	-0.000132***
	(0.000166)	(0.0122)	(0.0117)	(0.00204)	(0.0000497)
Controls	Y	Y	Y	Y	Y
Bank Group	All	Very Large	Large	Regional	Community
Bank FE	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y
Obs.	24,808	341	350	1,773	22,338
R^2	0.792	0.955	0.933	0.741	0.806

Panel C - 2017Q1 to 2022Q4

	REIT CL Commitments over Assets				
	(1)	(2)	(3)	(4)	(5)
CRE Exposure / Assets	0.00265***	0.0200	0.00604	0.00870***	0.0000306
	(0.000714)	(0.0167)	(0.0142)	(0.00199)	(0.0000373)
Controls	Y	Y	Y	Y	Y
Bank Group	All	Very Large	Large	Regional	Community
Bank FE	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y
Obs.	8,227	324	526	2,324	5,046
R^2	0.938	0.967	0.978	0.895	0.615

Table IA.B.2: Substitution Explanations CRE vs REIT CLs

The table presents results from regressing the share of REIT credit line commitments in the total exposure to the CRE market on potential explanatory factors for substitution. Column (1) shows the results for all banks, Column (2) for banks larger than 250 USD billion in total assets, Column (3) for banks larger than 100 USD billion in total assets, Column (4) for banks larger than 10 USD billion in total assets, and Column (5) for banks smaller than 10 USD billion in total assets. The sample period is 2009Q4 to 2016Q4. All right hand side variables are standardized to make coefficients comparable. Standard errors are clustered at the bank level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

	REIT Share in CRE Exposure (%)				
	(1)	(2)	(3)	(4)	(5)
Equity / Assets	-0.0788	-3.494	-2.852***	-0.337	-0.0164
	(0.0703)	(2.888)	(0.732)	(0.297)	(0.0327)
Underwriting Fees / Assets	0.165**	0.504***	0.396***	-0.101	-0.0222
	(0.0774)	(0.159)	(0.0857)	(0.674)	(0.0416)
CL Commitments / Assets	0.288***	4.179*	0.658	1.002***	0.118*
	(0.0690)	(2.190)	(0.444)	(0.204)	(0.0707)
Controls	Y	Y	Y	Y	Y
Bank Group	All	Very Large	Large	Regional	Community
Bank FE	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y
Obs.	24,698	341	342	1,745	22,264
R^2	0.842	0.886	0.900	0.837	0.822