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

Viral V. Acharya, Manasa Gopal, **Maximilian Jager**, Sascha Steffen

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# Motivation

- An increasing share of bank credit lines gets issued to NBFI borrowers (25% in 2010, 34% in 2022)
- These credit lines expose banks to idiosyncratic risks inherent in NBFIs' asset and liability choice
- Since NBFI financing is, however, highly cyclical, these credit lines amplify banks' exposure to aggregate liquidity shortages

$\Rightarrow$ In this paper, we use credit lines to REITs as a laboratory to analyze these risks

## In a nutshell

- **Fact:** Commercial Real Estate (CRE) in the US is struggling
- **Popular narrative:** small banks are affected, but large banks not so much
- **This paper:** we show that large banks are strongly affected, too
    - Large banks give credit lines (CLs) to Real Estate Investment Trusts (REITs)
    - REITs have very high drawdown sensitivity to stress
    - Bank stock returns historically suffered from REIT CL exposure
    - Stress test exercise reveals significant capital shortfall among large US banks

# Commercial Real Estate Crisis

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## The Clearest Sign Yet That Commercial Real Estate Is in Trouble

Lenders are issuing a record number of foreclosure notices related to risky property loans

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## Commercial Property Losses Hammer Banks on Three Continents

Banks in the U.S., Japan and Switzerland announced losses tied to troubled real-estate lending

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Analysis

## FSOC Says CRE Is Big Financial Risk

The 2023 annual report said banks hold about half of $6 trillion in commercial real estate loans with signs of stress having emerged.

By **Erik Sherman** | December 18, 2023 at 08:12 AM

In its **2023 annual report**, the Financial Stability Oversight Council — a legacy of the Dodd-Frank Act that includes a broad array of federal banking regulators and others — pointed to multiple financial risks for the U.S. First on the list, commercial real estate.

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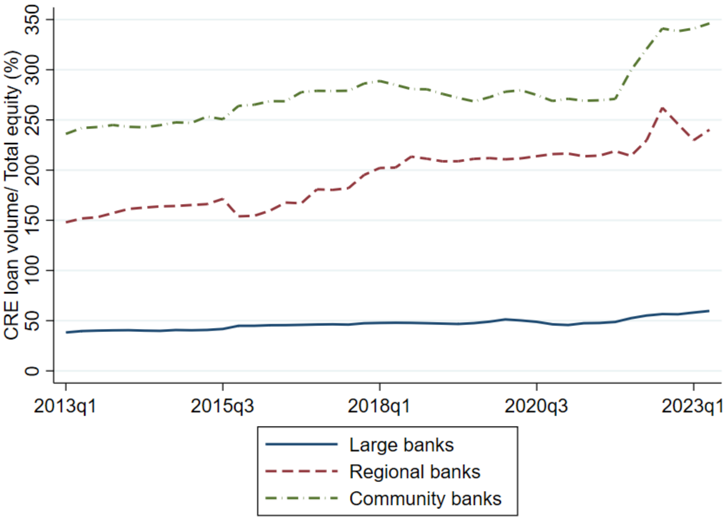
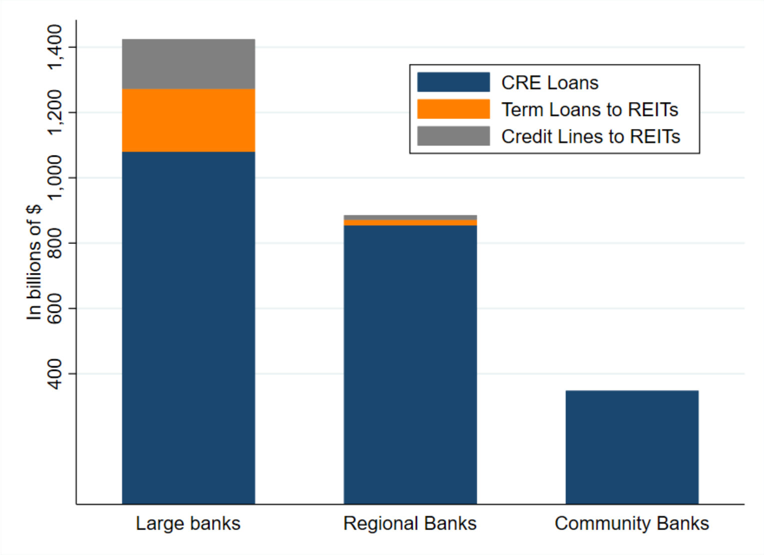
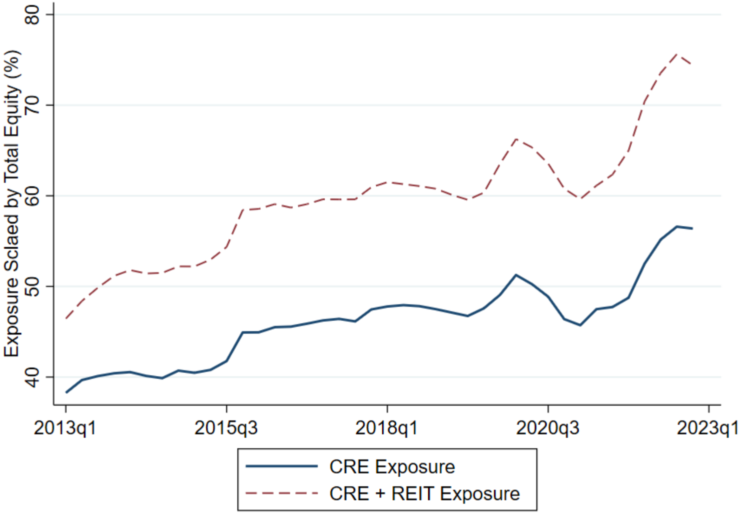
# Crisis of smaller banks?



# Banks' Total Exposure to CRE



# Large Banks' Total Exposure to CRE



# Credit Lines

What is a credit line?

- Lender commits to provision of credit at pre-arranged terms (interest rate etc.)
- Borrower decides if and when to use the provided credit ("drawdown")
- Borrower decides when to repay the provided credit

## Credit Lines

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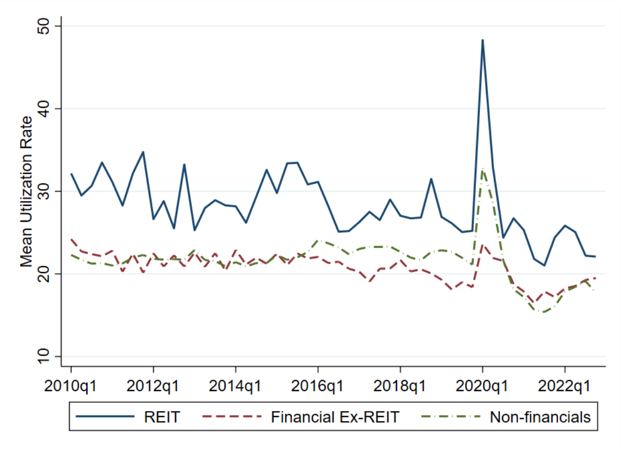
How do drawdowns affect banks?

- Credit line commitments are reported "off-balance sheet"
- When credit lines are drawn, it becomes a loan on the bank's balance sheet
- Banks have to finance these loans - both with liquidity and capital
- If there are correlated drawdowns (like during COVID-19), it may put pressure on bank balance sheets and affect bank performance

# Background - REITs

- Real Estate Investment Trust (REIT) invest in properties (equity REIT) or mortgages (mREIT)
- More than 95% of REIT investments ($4 trillion) are into commercial real estate
- Special: Need to distribute min. 90% of profits as dividends $\rightarrow$ hard to build cash buffers $\rightarrow$ depend on CL for cash
- Funds from CLs are used for acquiring properties in good times and hoarding cash, respectively dealing with redemptions, in bad times (see evidence in paper)

# Differential drawdowns of REITs




- REITs draw down more than non-financial corporations on average
- REITs have other spikes and cyclicality as well

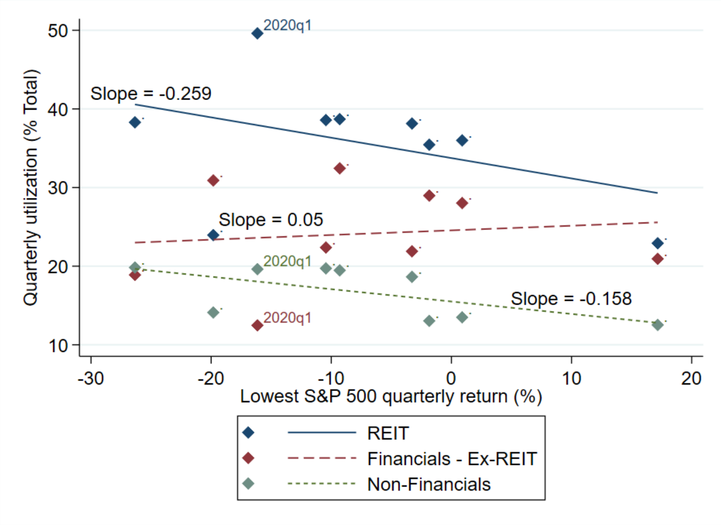
# Differential drawdowns of REITs

| | Utilization Rate (%) | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| REIT | 7.606*** | 8.063*** | 8.069*** | 8.001*** | 9.486*** |
| | (0.276) | (2.232) | (2.234) | (2.240) | (2.851) |
| 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. | 246,872 | 182,384 | 182,384 | 182,384 | 105,348 |
| $R^2$ | 0.003 | 0.171 | 0.180 | 0.177 | 0.188 |

# Differential drawdowns of REITs as a function of stock performance

| | Utilization Rate (%) | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| REIT x S&P 500 return | -1.549*** | | | -1.465** |
| | (0.559) | | | (0.600) |
| REIT x Positive S&P 500 return | | -0.788 | | |
| | | (1.218) | | |
| REIT x Negative S&P 500 return | | -1.892** | | |
| | | (0.867) | | |
| REIT x VIX | | | 1.993*** | |
| | | | (0.711) | |
| REIT x Sub-sector return | | | | -1.424* |
| | | | | (0.731) |
| Controls | Y | Y | Y | Y |
| Rating Group FE | Y | Y | Y | Y |
| Year-Quarter FE | Y | Y | Y | Y |
| Obs. | 187,470 | 187,470 | 187,470 | 126,810 |
| $R^2$ | 0.172 | 0.172 | 0.172 | 0.155 |

# Utilization rates of REITs vs other borrowers in crises



## Take-Aways

- REITs draw down more than other firms, in general
- REITs are more sensitive to market stress than others, and have greater sensitivity to their own performance compared to non-financial firms

# Effect on banks – market shock

| | Quarterly bank stock returns (%) | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| REIT CL Exposure (std.) | 0.0842 | 0.187 | 0.169 | 0.145 |
| | (0.108) | (0.129) | (0.136) | (0.138) |
| REIT CL Exposure (std.) x Crisis | -1.460*** | -1.456*** | -1.425*** | -1.402*** |
| | (0.426) | (0.483) | (0.490) | (0.459) |
| Non-REIT CL Exposure (std.) | | -0.481** | -0.475** | -0.479*** |
| | | (0.185) | (0.187) | (0.178) |
| Non-REIT CL Exposure (std.) x Crisis | | -0.0111 | -0.0124 | -0.377 |
| | | (0.384) | (0.383) | (0.376) |
| CRE Exposure (std.) | | | | -0.402* |
| | | | | (0.230) |
| CRE Exposure (std.) x Crisis | | | | -1.895*** |
| | | | | (0.554) |
| Controls | Y | Y | Y | Y |
| Fama-French 3 Factor | Y | Y | Y | Y |
| Obs. | 9,014 | 9,014 | 9,014 | 9,014 |
| $R^2$ | 0.482 | 0.483 | 0.483 | 0.486 |

## Effect on banks – identification

- Banks with higher credit line exposure to REITs fare worse in crises
- What if banks that provide credit lines to REITs are just very different in terms of business model?
- Solution: create a more granular shock

$$\begin{aligned} \textit{REIT Subsector Shock}_{i,t} = \sum_k & \textit{Exposure Share to Subsector}_{k,t} \times \\ & \textit{Growth Rate Subsector Index}_{k,t,t-4} \end{aligned}$$

- This shock measure captures granular performance of bank portfolios as not all CRE sectors perform the same!

# Effect on banks – granular shock

| | Quarterly bank stock returns (%) | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| REIT CL Exposure (std.) | -0.0813 | 0.0336 | 0.00200 | -0.0332 |
| | (0.111) | (0.131) | (0.137) | (0.134) |
| REIT CL Exposure (std.) x REIT Subsector Shock (std.) | 0.131* | 0.165** | 0.171** | 0.141* |
| | (0.0707) | (0.0754) | (0.0772) | (0.0772) |
| Non-REIT CL Exposure (std.) | | -0.521** | -0.515** | -0.561** |
| | | (0.238) | (0.238) | (0.222) |
| Non-REIT CL Exposure (std.) x REIT Subsector Shock (std.) | | -0.0715 | -0.0709 | -0.0280 |
| | | (0.0866) | (0.0893) | (0.0897) |
| CRE Exposure (std.) | | | | -0.675*** |
| | | | | (0.234) |
| CRE Exposure (std.) x REIT Subsector Shock (std.) | | | | 0.219 |
| | | | | (0.176) |
| Controls | Y | Y | Y | Y |
| Fama-French 3 Factor | Y | Y | Y | Y |
| Obs. | 9,014 | 9,014 | 9,014 | 9,014 |
| $R^2$ | 0.482 | 0.483 | 0.483 | 0.486 |

# Pass-through to and effect on banks

Take-Aways:

- Banks with higher REIT CL exposure suffer more in times of individual REIT or general market stress
- This effect goes beyond the general systemic/aggregate drawdown risk
- This effect goes beyond the general CRE exposure risk

# SRISK

How to incorporate the systemic risk from REIT CIs into bank stress tests and quantify its impact?

- Adapt SRISK methodology and simulate a 40% market downturn
- Multiply bank-specific exposure values as of 2022Q4 and coefficients from bank stock return regression
- Contrast impact of credit line business in general, the relevance of REITs as a borrower class and the impact of direct on-balance sheet CRE exposure

# Effect on banks

| Bank (Group) | $\text{SRISK}^{Baseline}$ | $\text{SRISK}^{LRMES}$ No Heterogeneity | $\text{SRISK}^{LRMES}$ REIT Heterogeneity | $\text{SRISK}^{LRMES}$ CRE exposure |
|---|---|---|---|---|
| JPMORGAN CHASE & CO. | 65.8 | 16.2 | 26.0 | 0.3 |
| BANK OF AMERICA CORPORATION | 77.5 | 15.9 | 26.0 | 0.3 |
| WELLS FARGO & COMPANY | 39.8 | 12.2 | 20.2 | 0.4 |
| GOLDMAN SACHS GROUP, INC., THE | 49.9 | 4.8 | 7.8 | 0.0 |
| MORGAN STANLEY | 11.3 | 4.9 | 8.4 | 0.1 |
| All banks (N = 43) | 464.6 | 97.3 | 169.5 | 3.5 |
| Large banks (N = 21) | 464.8 | 90.3 | 153.6 | 2.6 |
| Regional banks (N = 22) | -0.2 | 7.0 | 15.9 | 0.9 |

# Conclusion and Outlook

- Banks are exposed to (systemic) risks through credit lines to NBFIs
- CRE crisis can impact banks through their CL exposure to REITs – borrowers who are very sensitive to financial stress
- This correlated drawdown risk stemming from REITs for large banks seems to have been ignored in recent discussions in the press and by policymakers
- The systemic risk stemming from CL to REITs is a multiple of the risk stemming from direct CRE exposure
- General implication: through the provision of liquidity insurance, the risk of the shadow banking sector always touches the feet of the banking sector