Where Do Banks End and NBFIs Begin?

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Presentation at the NY Fed conference on NBFIs

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* The views expressed in this paper are those of the authors and do not necessarily represent those of the Federal Reserve Bank of New York, the Federal Reserve System, or any of their staff.

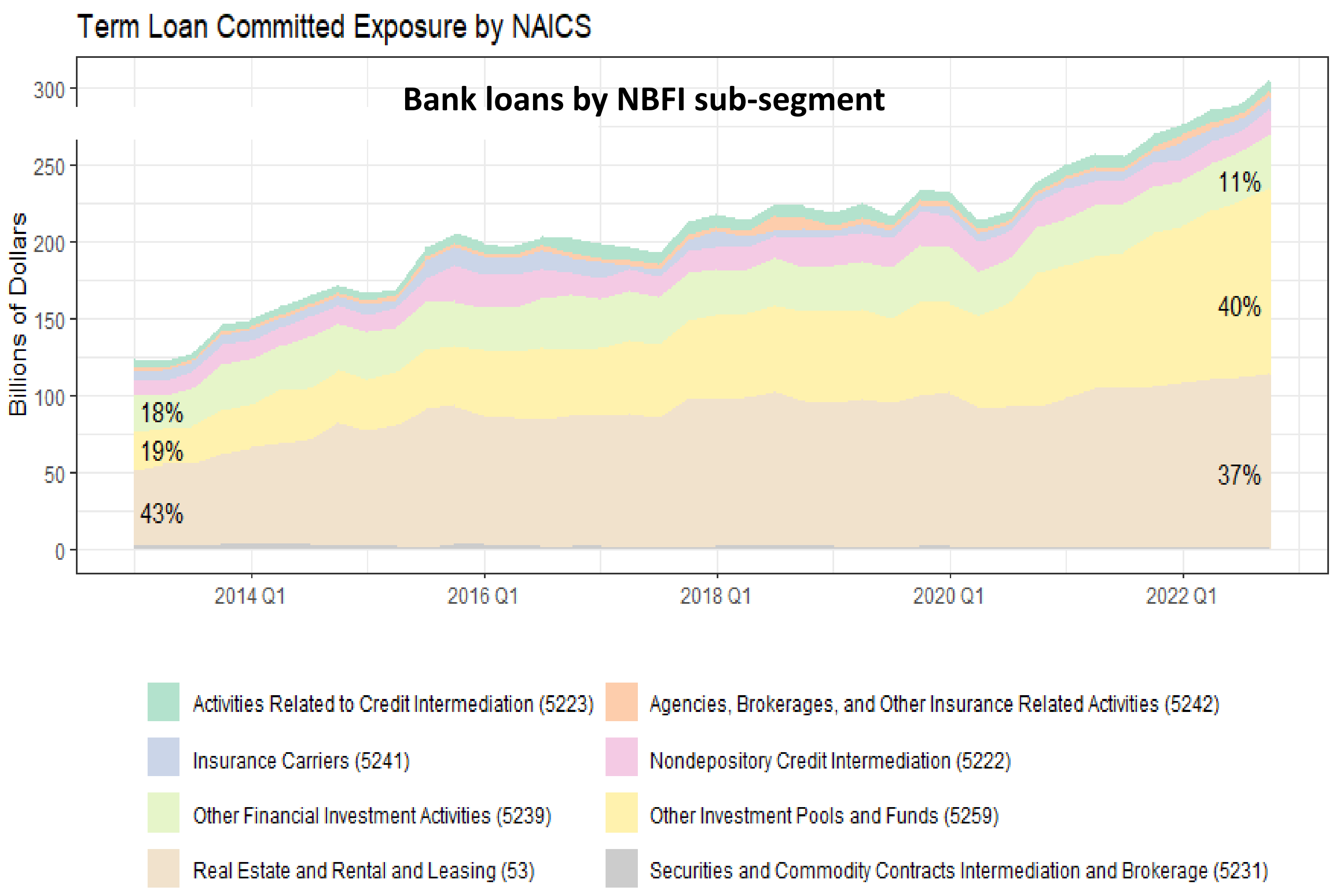
Our version of Goodhart's Law for NBFIs

"As the banking perimeter is used for "control" (regulatory) purposes, but activity around the perimeter can be "manipulated" (via regulatory arbitrage) by banks and non-bank financial intermediaries, does the regulatory perimeter inexorably cease to be useful for control purposes?"

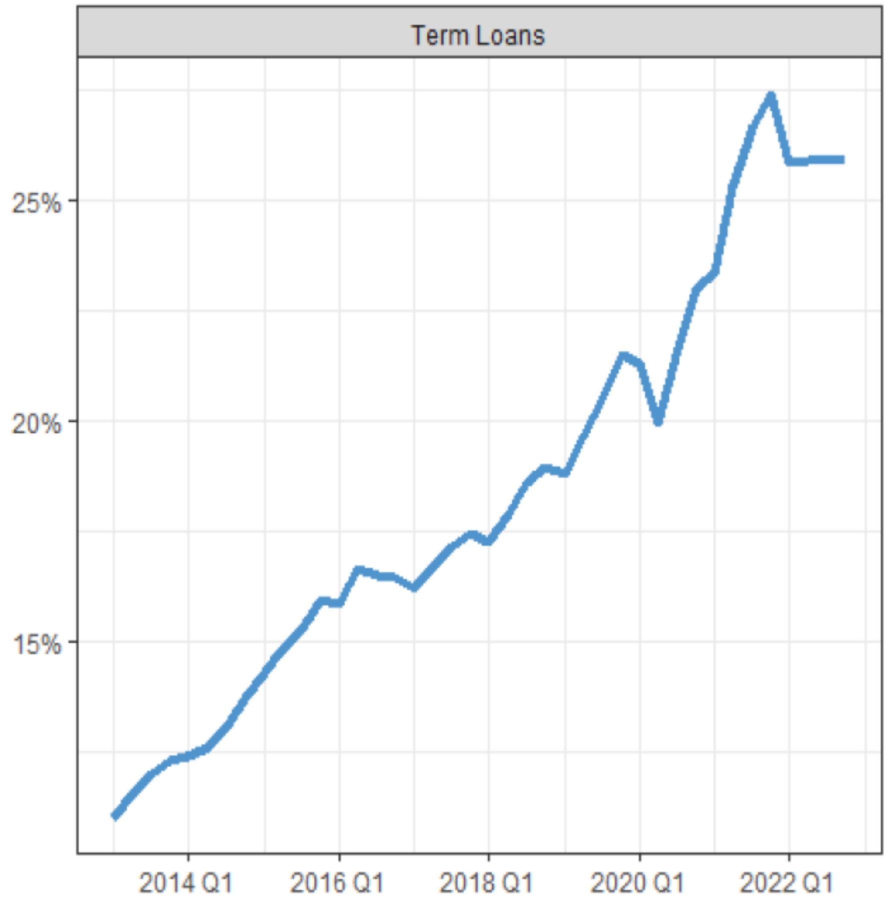
<u>Are banks then actively *transforming* their risk exposures towards NBFIs?</u>

1. Large increase of bank loans to NBFIs post GFC

Source: FR Y-14Q



NBFI loans as share of total bank loans



2. Funding Interconnections across Banks and NBFIs

- Newly released Financial Flow of Funds (From Whom To Whom or FWTW) provides a useful window on bank-NBFI linkages

- Non-bank financial intermediaries heavily dependent on banks for funding
- Banks also dependent on non-bank financial intermediaries

- Asymmetric dependence:

  Non-bank reliance on banks far greater than bank reliance on non-banks

- Patterns stable over time

Most nonbanks substantially dependent on banks

Banks holders of NBFI liabilities

MATRIX OF DEPENDENCE

HOLDERS

ISSUERS	ABS	Banks	B/Ds	eREITs	FCs	GSEs	Life Ins.	MMMFs	mREITs	MFs	OFB.	PC Ins.	PFs	Real	RoW	TOTAL
ABS	0	10	0	0	0	1	40	3	0	3	5	8	2	3	26	100
Banks	0	10	2	0	0	4	2	1	0	1	1	0	1	62	15	100
Broker/Dealers	0	25						9	0	1	0	0	-1	11	30	100
Equity REITs	3	25						0	2	7	0	3	7	19	18	100
Finance Companies	0	15						0	0	7	1	3	6	22	33	100
GSE and Agency	0	35						9	2	6	0	1	4	21	15	100
Life Ins.	2	4						0	0	0	0	0	11	73	2	100
MMF	0	0						0	0	4	8	1	5	77	4	100
Mortgage REITs	0	8						10	0	6	0	2	5	7	38	100
Mutual Funds	0	0						0	0	0	0	0	27	59	6	100
Other Fin. Bus.	0	3						1	0	1	7	0	4	25	2	100
PC Ins.	0	1						0	0	0	0	8	2	74	13	100
Pensions	0	0						0	0	0	0	0	0	100	0	100
																100
Real Sector	1	14	1	0	1	9	3	1	0	3	0	1	11	37	19	100
Rest of World	0	22	3	0	3	1	7	3	0	5	1	3	4	48	0	100

10% of ABS Issuers liabilities

25% of B/Ds'

25% of eREITs'

15% of FCs'

35% of GSEs' …

The figures represent (in %) the composition of liabilities for each segment issuer (on each row), by each corresponding holder (on each column).

But banks not as dependent on nonbanks

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Banks largely dependent on the real sector for their funding

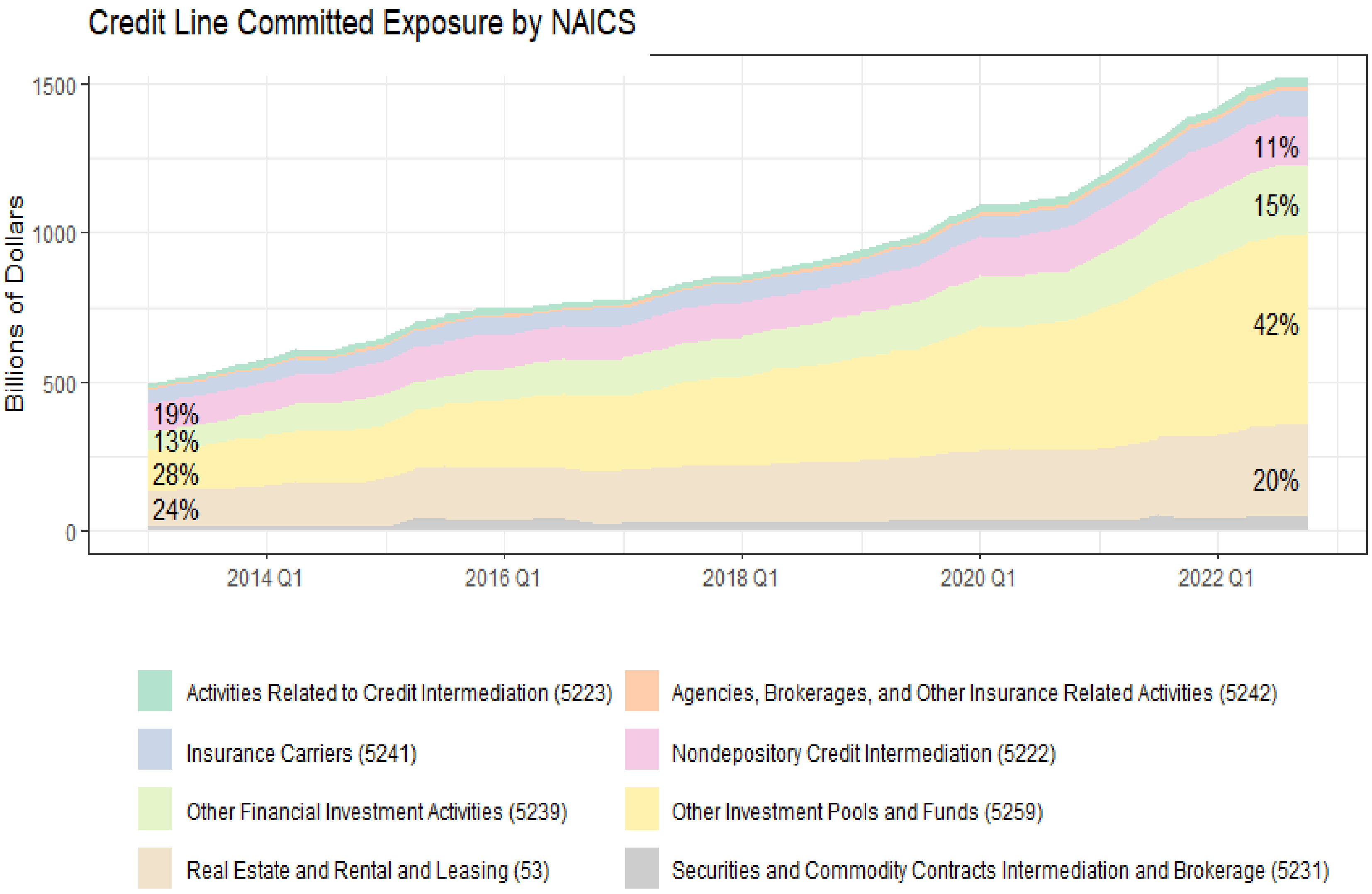
The figures represent (in %) the composition of liabilities for each segment issuer (on each row), by each corresponding holder (on each column).

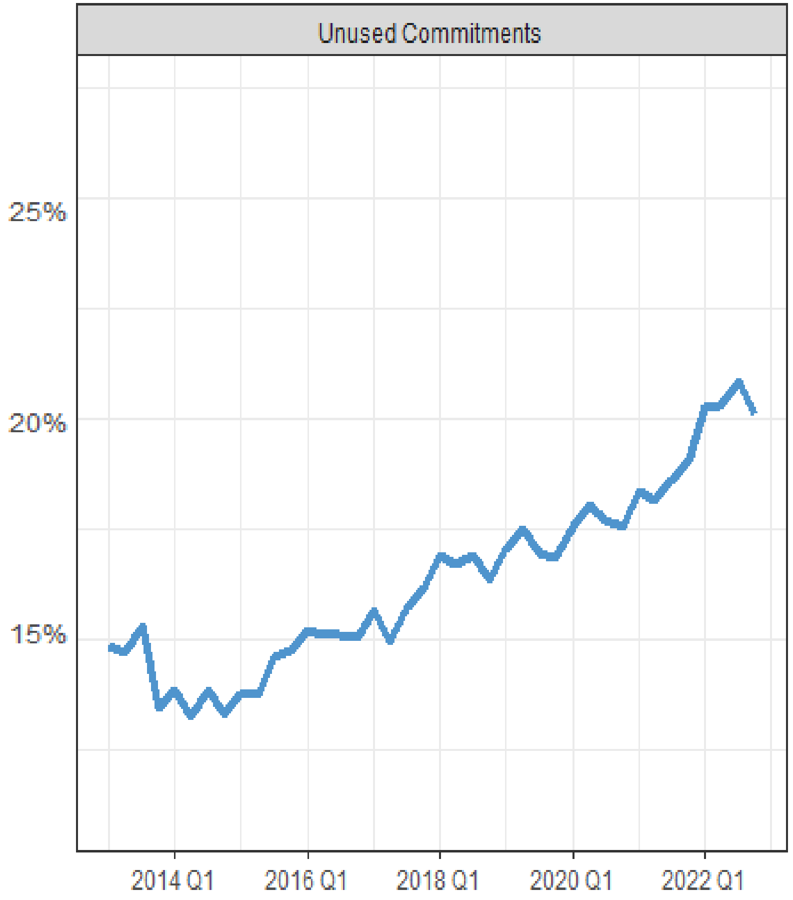
3. And large increase in credit lines to NBFIs as well

Bank credit lines by NBFI sub-segment

Source: FR Y-14Q

NBFI credit lines as share of total bank credit lines





Banks have a unique advantage in providing liquidity insurance

- Banks back private credit funds (e.g., BCRED bank lines ~= 50% liabilities)

- CLs to finance derivatives margin

  - UK Pension Fund crisis (Sep 2022), European Electricity Producers (August 2022)

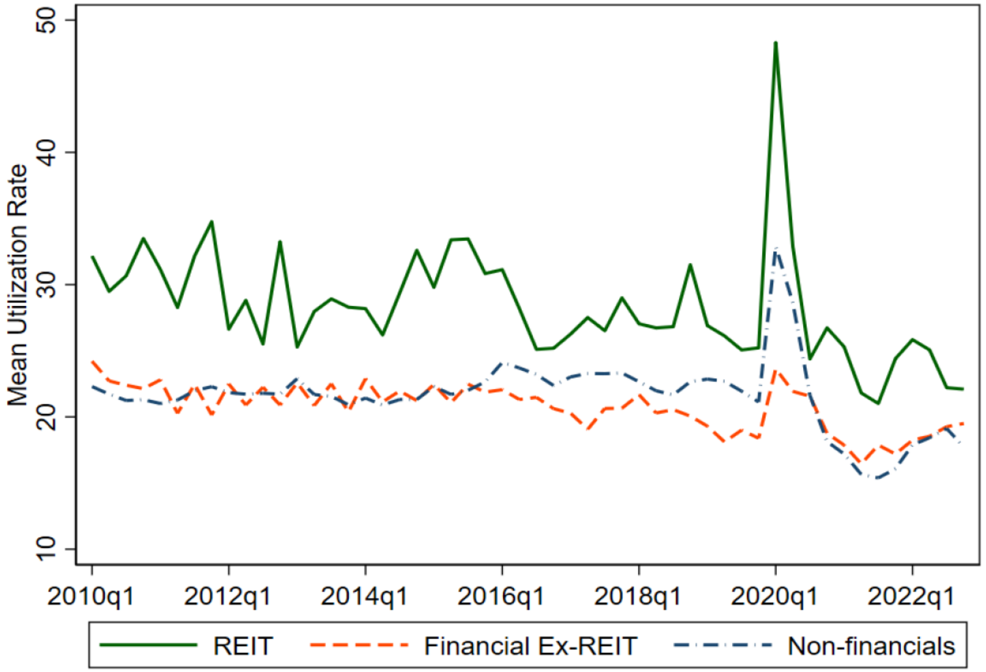
- Credit lines to help roll over funding risk (REITs in particular, but also CLOs)

  - NBFI credit line utilization rates large during COVID outbreak

  - Ongoing work

  - “Shadow Always Touches the Feet: Implications of Bank Credit Lines to Non-Bank Financial Intermediaries” (Acharya, Gopal, Jager and Steffen, 2024)

Differential drawdowns of REITs

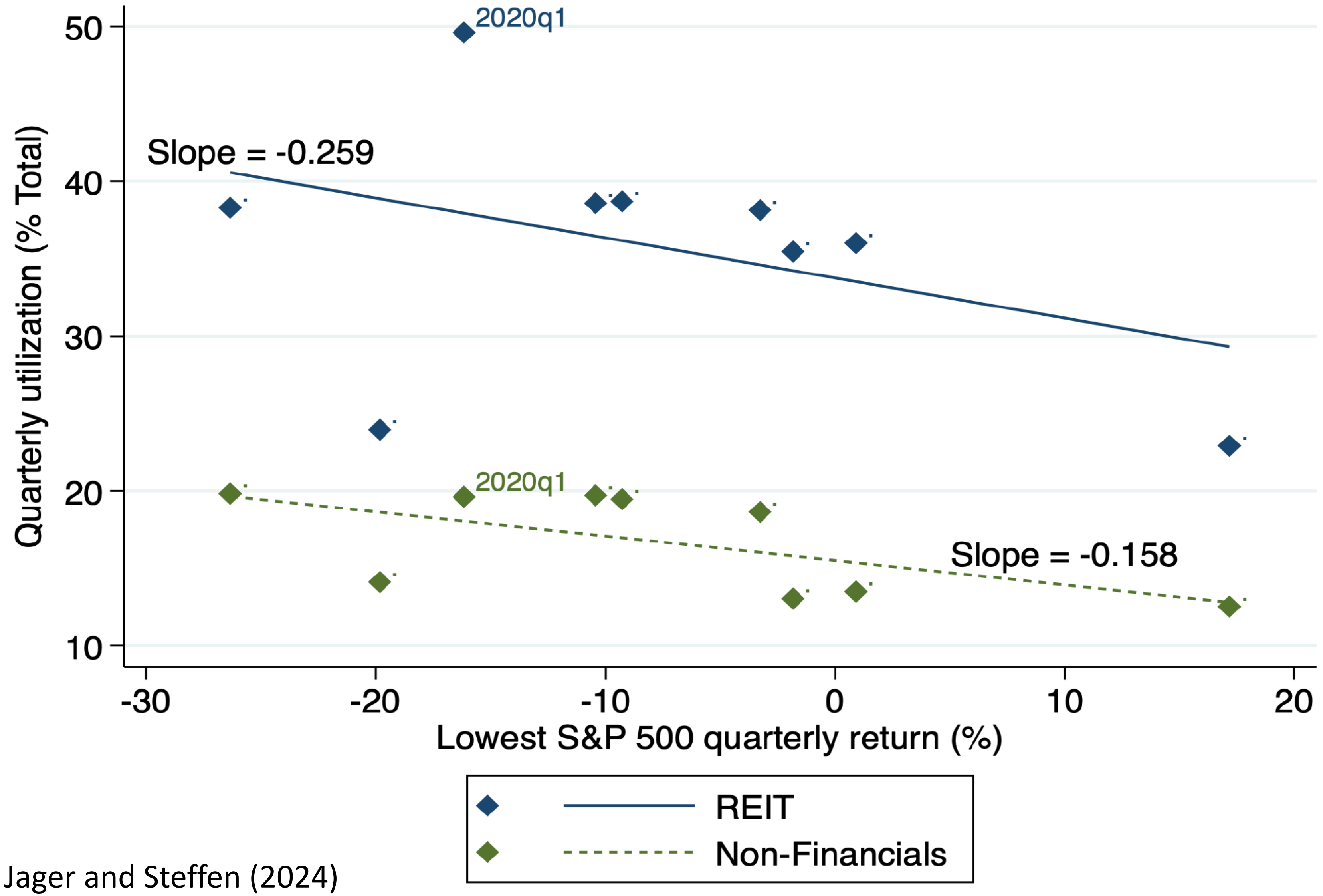


Sources: Capital IQ, Compustat.

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

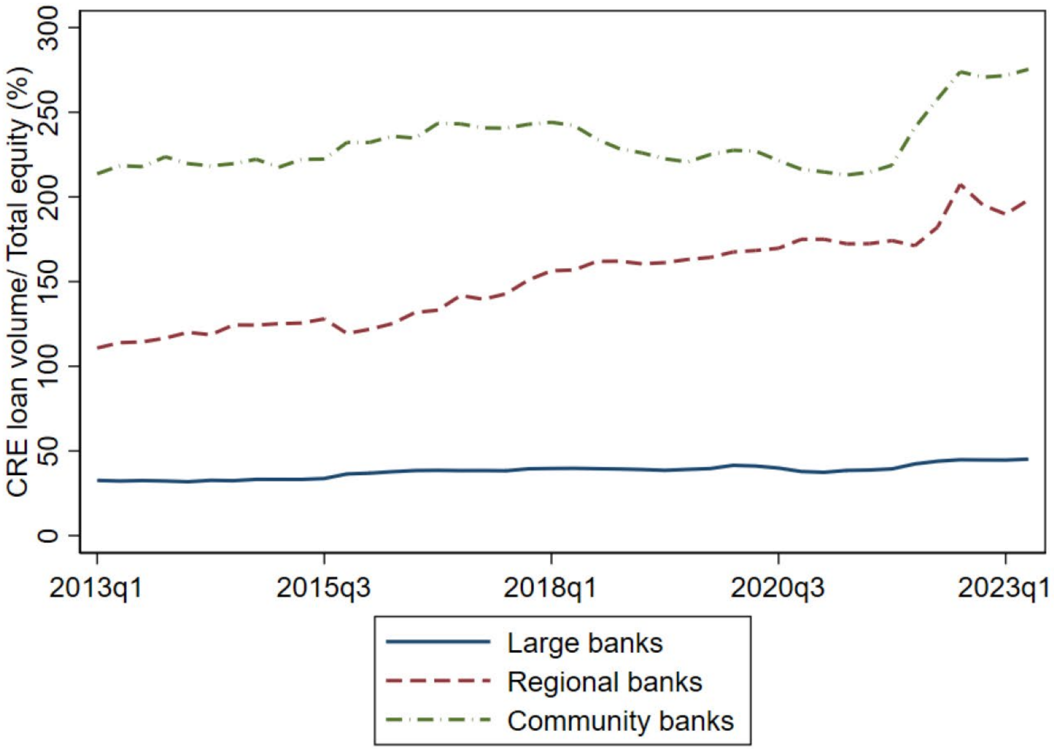
Source: Acharya, Gopal, Jager and Steffen (2024)

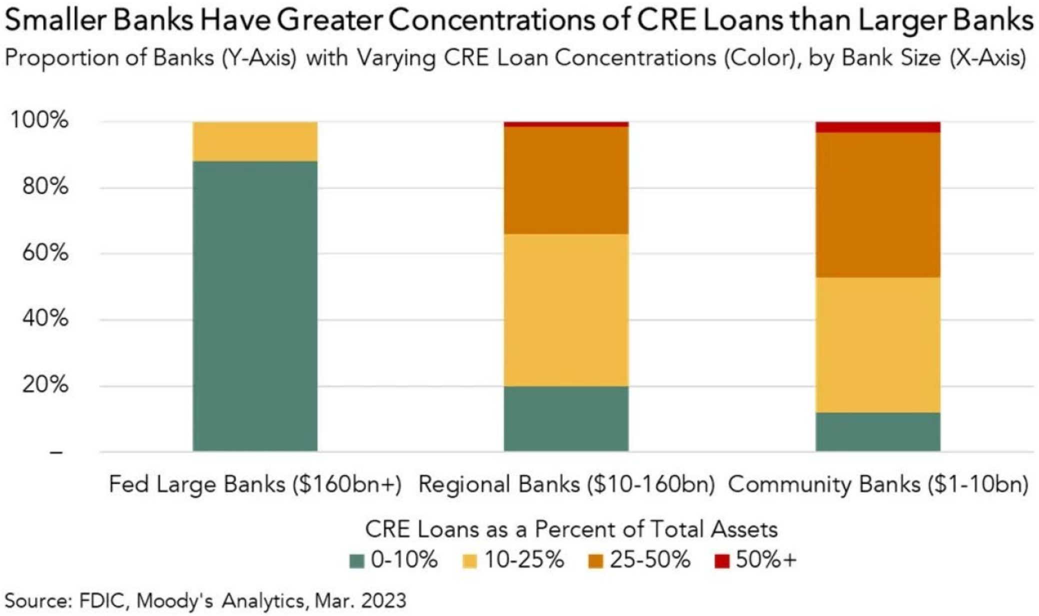
Utilization rates of REITs vs non-financials in crises



Source: Acharya, Gopal, Jager and Steffen (2024)

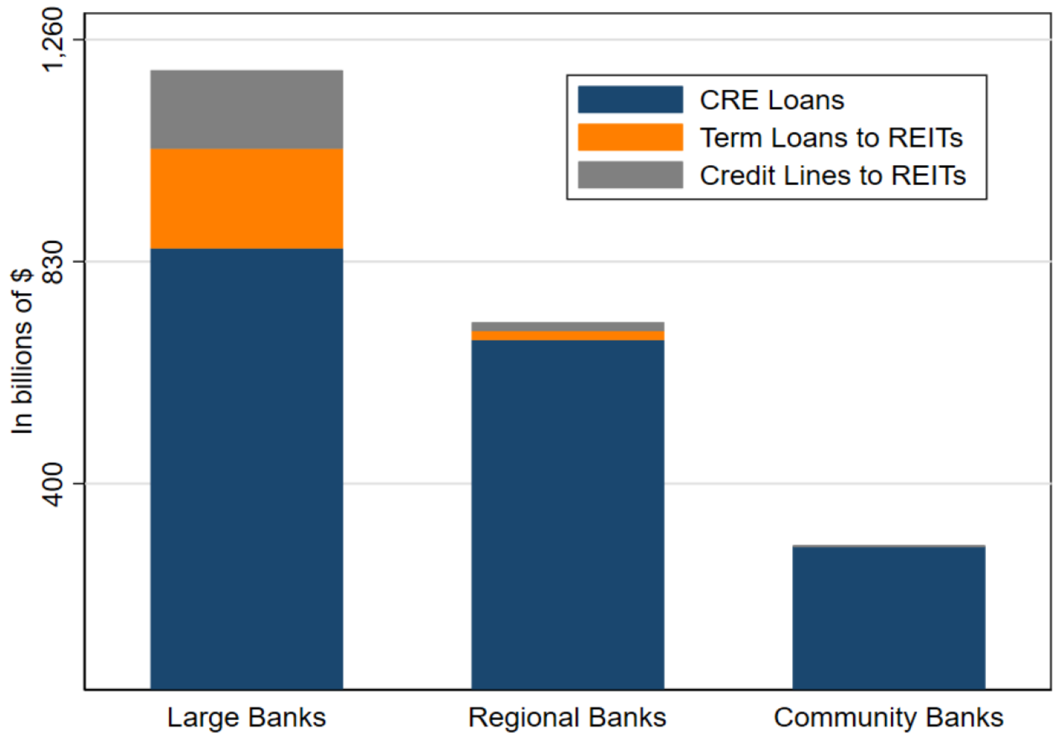
Regional Banking Crisis?

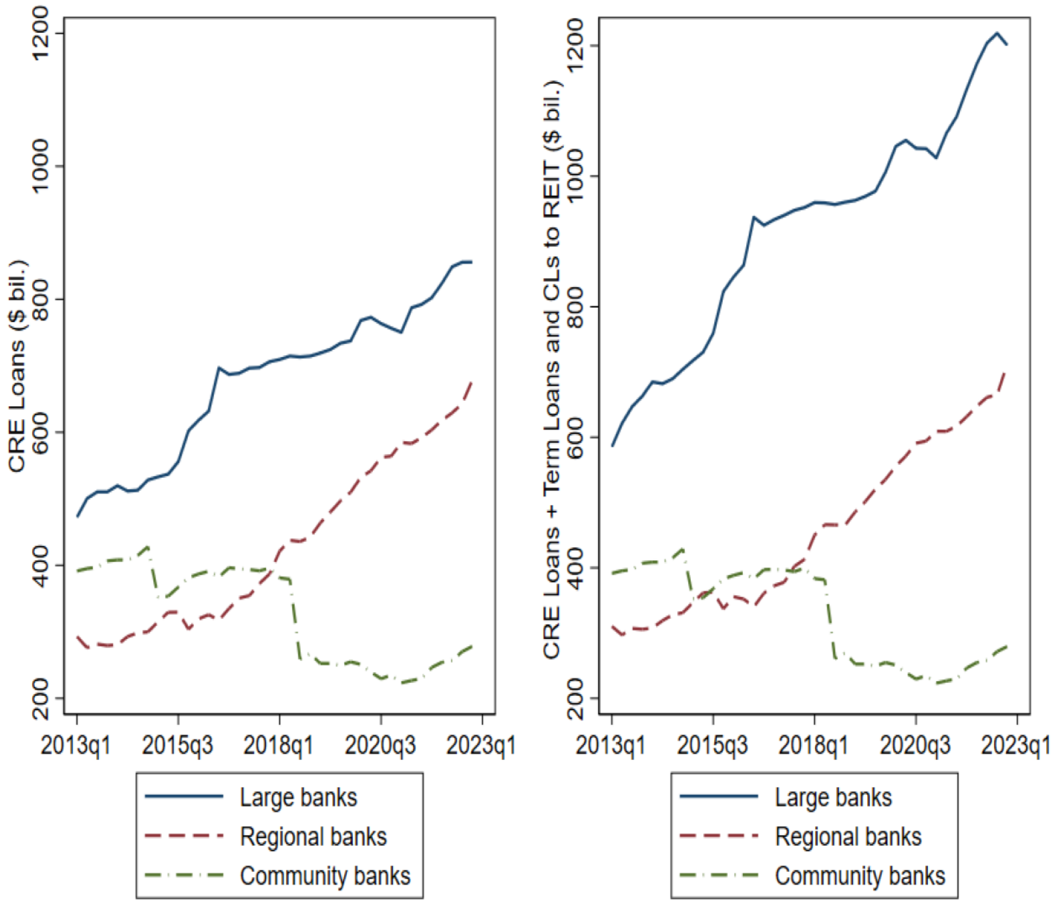




Source: Acharya, Gopal, Jager and Steffen (2024)

Banks' Total Exposure to CRE

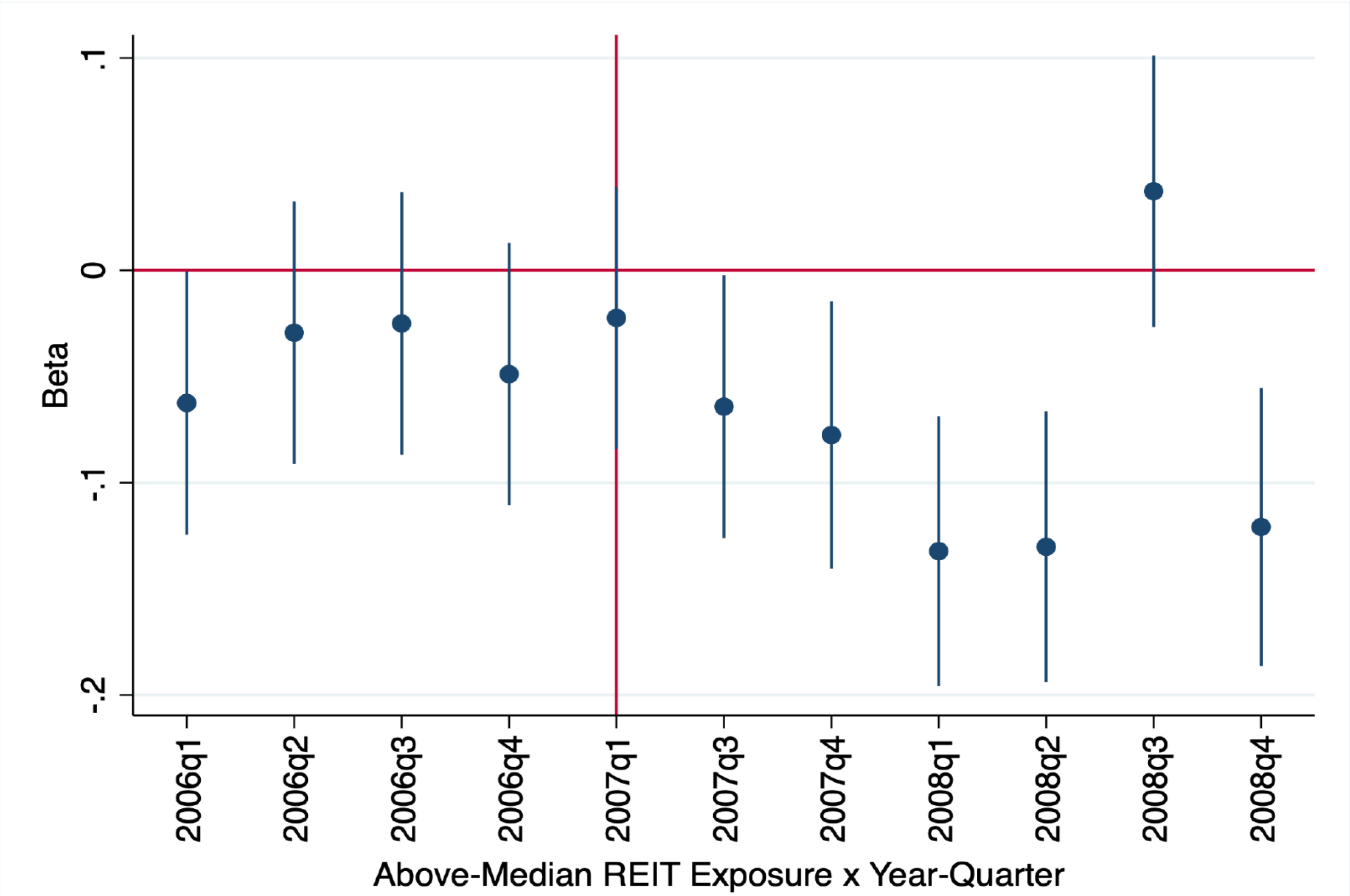




Source: Acharya, Gopal, Jager and Steffen (2024)

Bank Performance by REIT Exposure - COVID-19

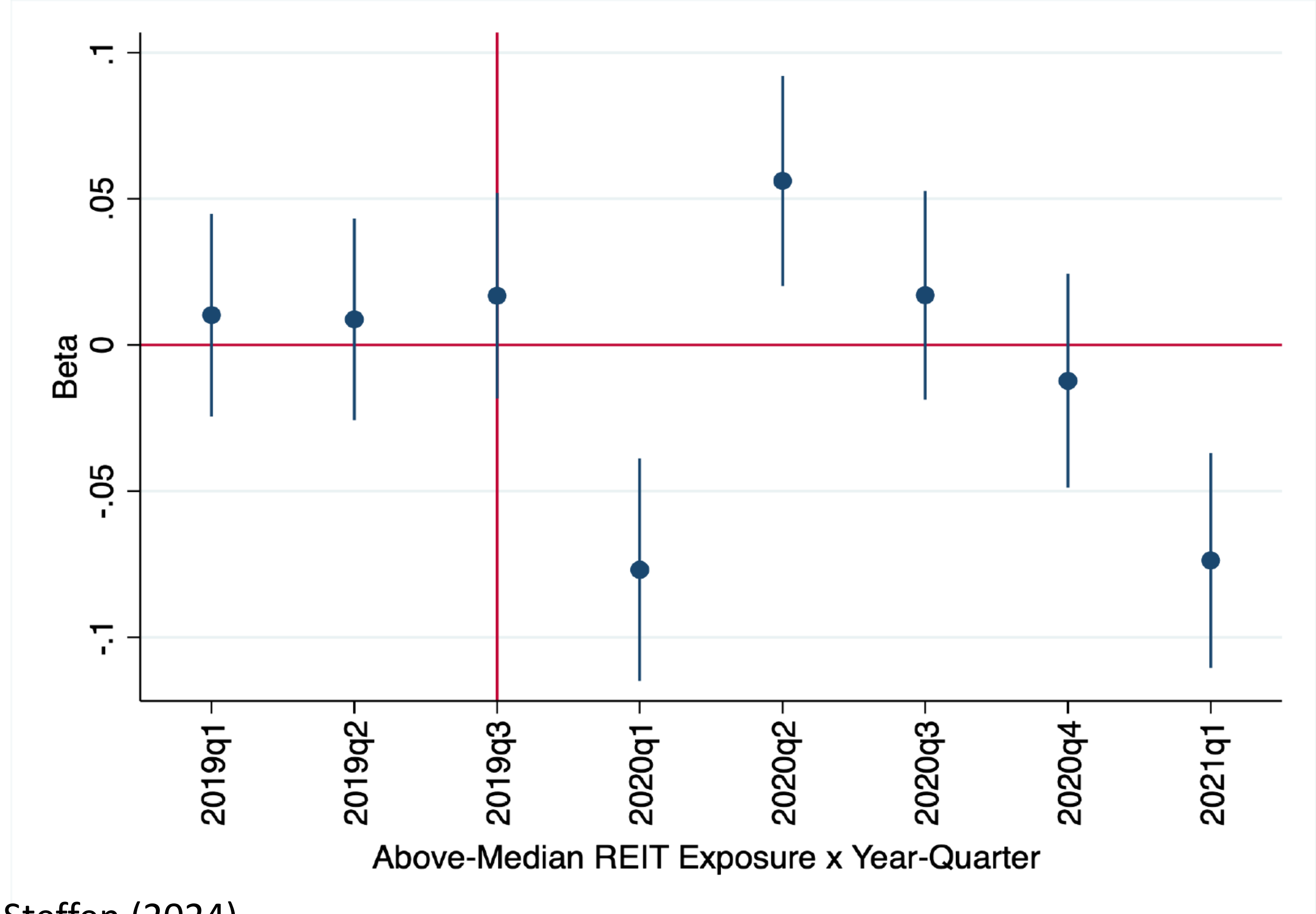
$$\text{BankStockReturn}_{it} = \beta_{it}\text{Above-median REIT CL Share}_i \times \mathbf{1}_t + X_{it} + \alpha_i + \gamma_t + \epsilon_{it},$$



Source: Acharya, Gopal, Jager and Steffen (2024)

Bank Performance by REIT Exposure - GFC

$$\text{BankStockReturn}_{it} = \beta_{it}\text{Above-median REIT CL Share}_i \times \mathbf{1}_t + X_{it} + \alpha_i + \gamma_t + \epsilon_{it},$$



Source: Acharya, Gopal, Jager and Steffen (2024)

Policy Implications

- Call for *integrated* monitoring of banks and NBFIs
- Enhanced bank stress testing to better capture NBFI exposures may not be enough
- “Congruent” regulation of NBFIs may be a solution only if regulation and monitoring as strict as that of banks. But that would effectively turn NBFIs into banks …
- Regulation that restricts banks in scope of intermediation may be counterproductive

Regulating NBFIs

Yiming Ma

Columbia Business School

New York Fed-ECB Workshop on Nonbank Financial Institutions

June 21, 2024

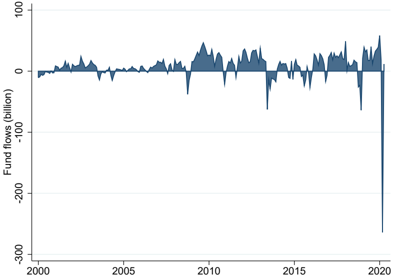
Before: Banks and Leverage

- The defining feature of banks is deposit funding
- Short-term debt backed by illiquid assets seen as the culprit of crises
- Monitoring of leverage + imposition of bank capital requirements

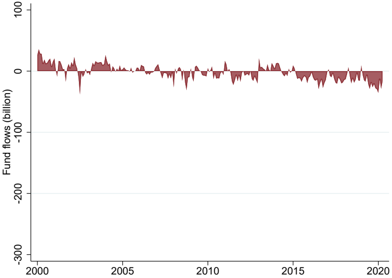
Now: NBFIs and Liquidity Transformation

- NBFIs engaged in liquidity transformation are often equity-funded with much lower leverage than banks
  - E.g., Bond mutual funds, Bond ETFs, MMMFs, REITS, stablecoins
- Remain subject to panic runs

Bond funds



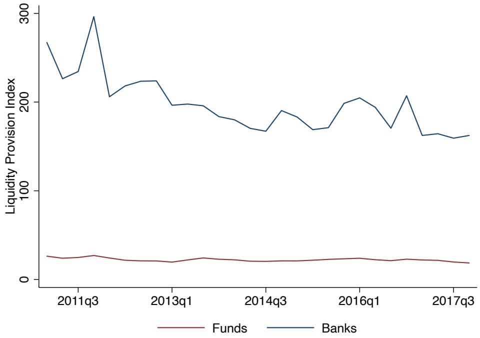
Equity funds



Ma, Xiao, and Zeng 21

From Leverage to Liquidity Mismatch

- Need to rethink leverage: no longer captures aggregate risk
- Need a coherent framework to monitor "risk" by functionality across banks and NBFIs
- One possible option: Liquidity Provision Index (Ma, Xiao, Zeng, 24)
  - Liquidity transformation by demandable debt versus demandable equity
  - How much liquidity does $1 of bank deposits vs $1 fund equity provide?



Sidenote: Improving the Design of NBFI's "Equity"

- The real problem: NBFI's demandable equity is not really "equity" because its value is not fully forward-looking
  - E.g. Mutual fund NAV does not sufficiently incorporate externalities
  - E.g. Gov MMF and retail prime MMF offer fixed $1 NAV
- Ideally: remove the debt-like features of NBFI equity as in swing pricing to make it "true equity"
- Until then, need coherent framework to monitor liquidity mismatch in the financial system instead of leverage

Lessons for Regulating NBFIs

Because Banks and NBFIs have shared functionalities:

1. Regulate liquidity mismatch across banks and NBFIs instead of narrowly focusing on leverage

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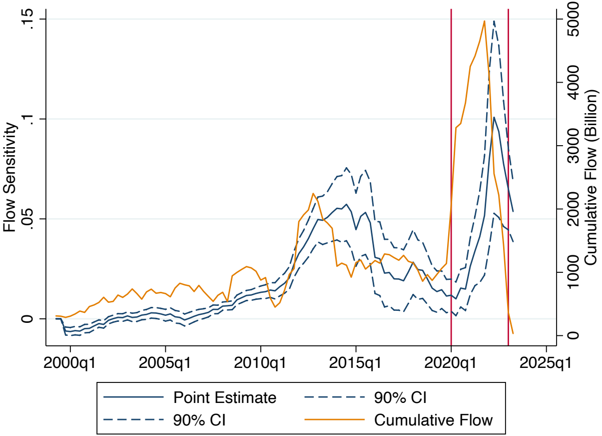
Spillover Effects between Banks and NBFIs

- Bank deposits and claims to NBFIs are imperfect substitutes for investors
- Investor switch between banks and NBFIs with increasing ease
  - E.g. March 2020: flight from NBFIs
  - E.g. March 2023: flight from Banks
- $\rightarrow$ the investor base in banks and NBFIs is time-varying and inter-dependent

Deposit Flightiness is Time-Varying

- Depositors' flow sensitivity increases with aggregate deposit inflows
- Incoming depositors' convenience value < existing depositors'



Li, Lu, and Ma 24

Policy Implifcations of Time-Varying Depositor Base

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   - QE and APP alleviate asset market strains
   - Reserves can only be held by banks
   - QE expands bank deposits (Acharya and Rajan 22, Acharya et at. 24)
   - $\rightarrow$ Interventions for NBFIs may amplify depositor flightiness

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3. Rate hikes trigger more run risk after large influx of investors and QE

Lessons for Regulating NBFIs

1. Regulate liquidity mismatch across banks and NBFIs instead of narrowly focusing on leverage
2. Consider spillover effects from investor flows between banks and NBFIs
   - + interactions with unconventional and conventional monetary policy

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Opening Remarks by Nellie Liang
Under Secretary for Domestic Finance
U.S. Department of the Treasury

New York Fed-ECB Workshop on Nonbank Financial Institutions

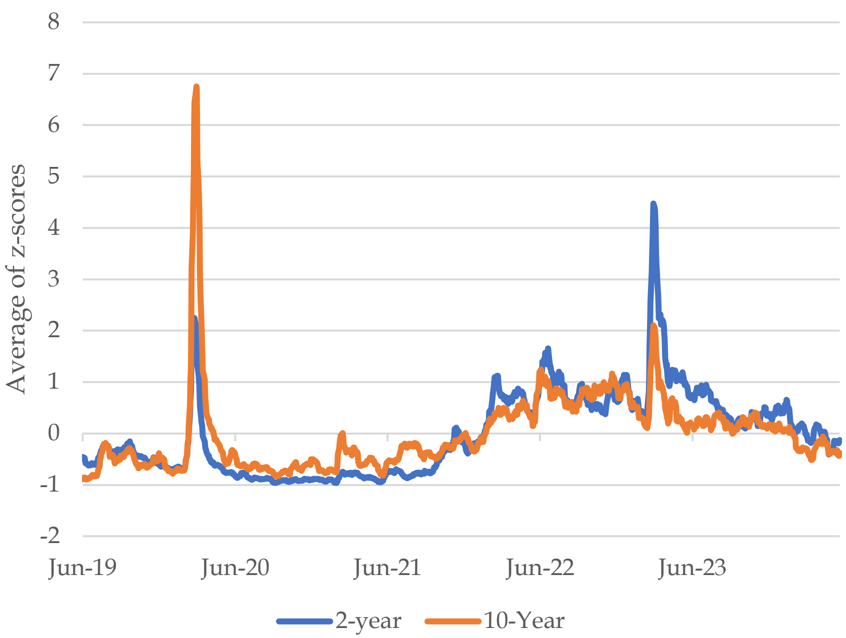
June 21, 2024

NBFIs and Systemic Risk

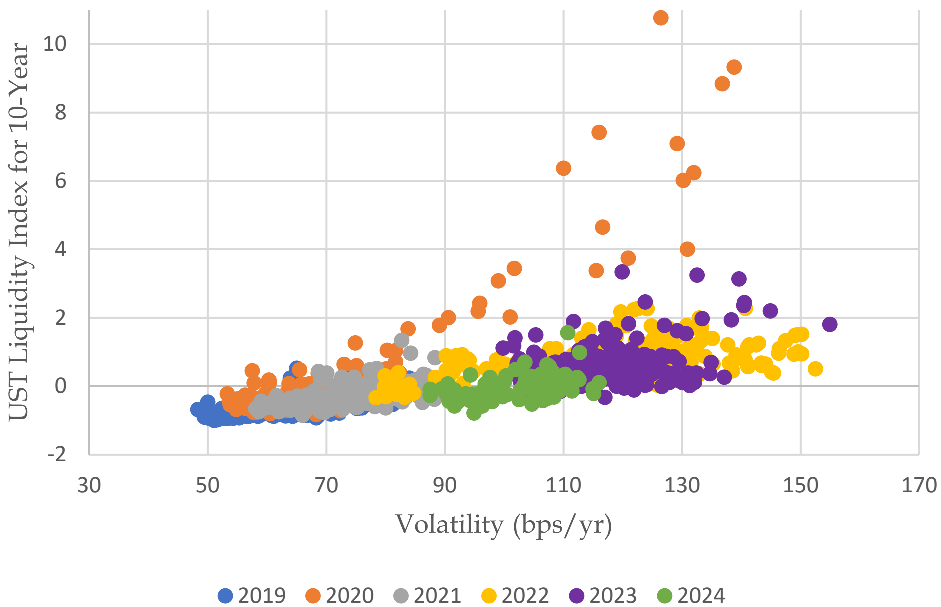
- NBFIs need access to liquidity in stress
- Liquidity can come from commercial banks or from selling Treasuries or other securities in the market
    - When banks and markets can't or won't provide liquidity to NBFIs, the official sector may feel compelled to respond
    - Responses are costly, creating a need for macroprudential policies
- Acharya et al. (2024) highlight the centrality of commercial banks as liquidity providers
- Treasury markets also are central to liquidity and financial stability

Treasury Market Liquidity and Yield Volatility

Liquidity Indices: 10 Day Moving Average



U.S. Treasury (UST) Liquidity Index vs Implied Volatility - 10-Year Tenor



Notes: Index inputs are bid-ask, inverted depth, and price impact. For each security, calculated as a simple average of 3 year rolling z-scores for each input.

Source: U.S. Department of the Treasury

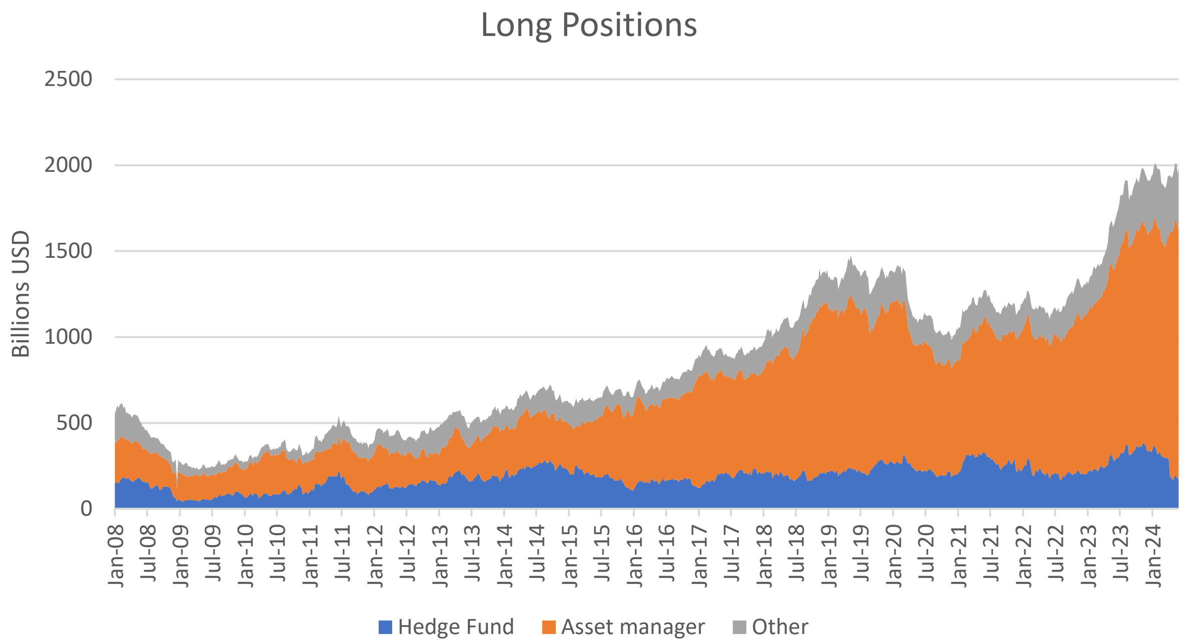
Strengthening Treasury Market Resilience

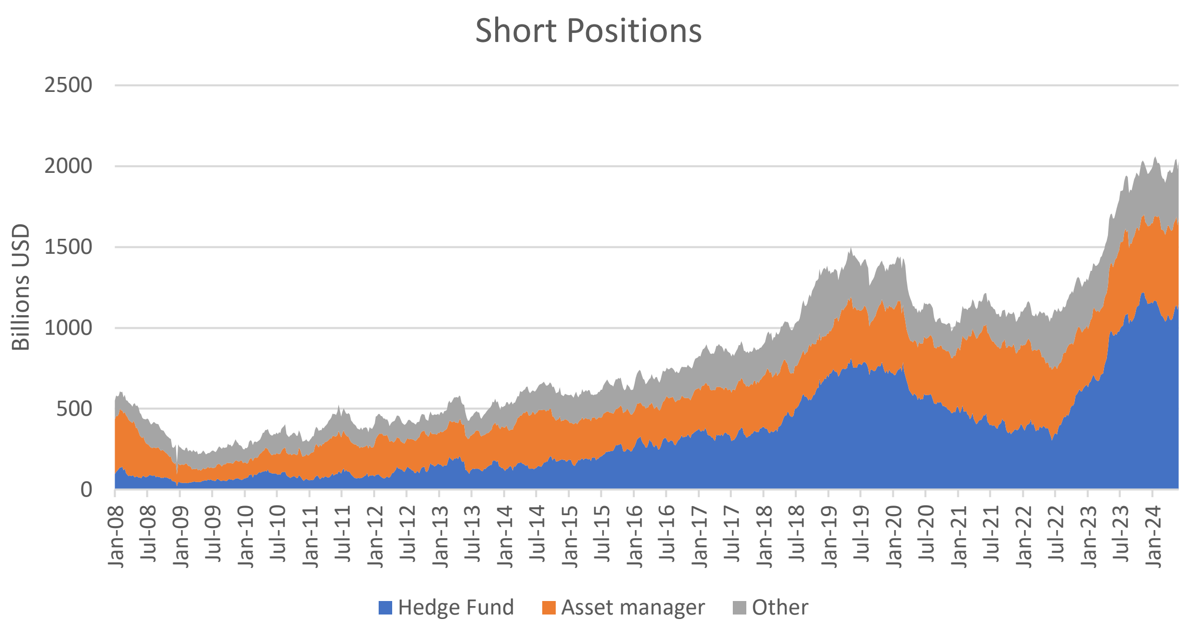
- The work has been structured as five workstreams

- Four workstreams to improve the resilience of supply of Treasury-market liquidity
  - Improving the resilience of market intermediation
  - Improving data quality and availability
  - Evaluating expanded central clearing
  - Enhancing trading venue transparency and oversight

- A fifth to reduce surges in demand for liquidity
  - Examining effects of leverage and fund liquidity risk management

Long and Short Treasury Futures Positions by Category





Source: CFTC

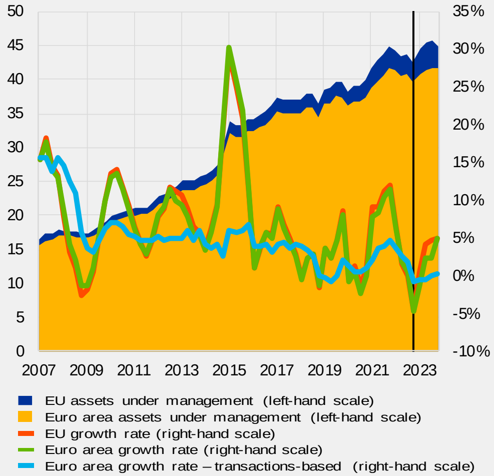
Non-bank financial institutions – EU developments and policy perspectives

ECB-FRBNY Workshop on Non-bank Financial Institutions, New York, 21 June 2024

Steffen Kern, Head of ESMA Economics, Financial Stability and Risk Department

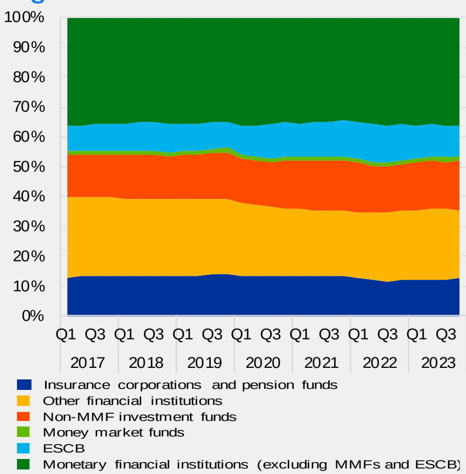
EU NBFIs have grown significantly

EU NBFI growth



Sources: ECB, ESRB, CoinMarketCap and ESMA

Significant share of the financial sector



Sources: ECB, ESRB

More than doubled in size since the GFC

- **Size:** EUR 42tn of assets, up from EUR 18tn
- **Investment funds as a key drivers**: EA funds manage EUR 19tn; key investor in some sectors of the economy
- **Staggering diversity:** >60' UCITS and AIF investment funds; plus wide range of pension funds, insurance companies, financial intermediaries

NBFIs can present risks to financial stability

- **Leverage:** Procyclicality of asset sales in stress
- **Liquidity mismatches:** Liquidity needs prompt asset sales due to liquidity mismatches or margin calls
- **Interconnectedness:** Transmit risks to other participants, esp. investors, counterparties

EU response: Cooperation, monitoring, policy

Unprecedented institutional cooperation: ESRB as forum for joint work

- ESRB: Coordination of activities across all levels
- ESMA and ESRB cooperation
  - Monitoring: NBFI monitor, risk dashboards
  - Stress test: MMFs, CCPs
  - Policy: Issues notes, Recommendations (MMFs, OEFs)

ESMA NBFI agenda

- Risk Monitoring and Risk Analysis on NBFIs
  - Risk Monitoring and Risk Analysis: Surveillance of key NBFI activities on basis of proprietary regulatory data (EMIR, SFTR, MMF, AIF), and commercial data
  - Stress simulation: OEFs
  - Public dissemination: TRV, Market Reports, Risk Analysis Articles
- Policy implementation of key EU legislative frameworks
  - Regulation: Advice to EU Commission (MMFs, AIFMD Review)
  - Macroprudential supervision: Data-driven supervision through Art. 25 AIFMD (annual assessment, Advice to NCAs), two successful examples (IE RE funds, IE/LU LDI)

EU legislative framework: Implementing global standards

Leverage in OEFs

- Risk assessment: (1) Ongoing regulatory reporting, quarterly leverage risk assessment by market participants NCAs and ESMA; (2) reporting based on ESMA Guidelines in line with IOSCO Recommendations (2019)
- Measures to address leverage-related risks: AIFMD Art. 25 measures activated in 2022 and 2024

Enhancement of liquidity risk management rules

- UCITS, AIFs: Quantity and price-based tools (e.g. swing pricing, dual pricing) more widely available and operational, in line with FSB and IOSCO Recommendations (2023)
- Loan-origination AIFs: New rules incl. leverage limits, retention of economic interest in loans granted, counterparty risk limits

Filling remaining data gaps

- AIFMD review: New or enhanced reporting set to improve the monitoring of fund sector, incl. UCITS and AIFs
- Data sharing: Ongoing efforts to further improve data sharing among competent authorities, incl. EBA, EIOPA, ESMA, ESRB, ECB, national authorities

NBFI stress: Lessons from 2020 DfC, 2021 Archegos, 2022 LDI

2020 "Dash for Cash" revealed vulnerabilities in the fund sector

- Liquidity risk materialised
  - Large outflows exceeding GFC levels; corporate and EM bond outflows >10% NAV, HY bond funds 15% NAV
  - Limitations on asset valuation under stress (corporate bonds, real estate)
  - Suspension of redemptions for some funds
- MMFs particularly affected
  - Liabilities: Heightened redemptions,10% to 30% of NAV depending on MMF type
  - Assets: CP and CD liquidity deteriorated quickly
  - Interconnectedness: High and sensitive exposures between bank and non-bank markets, connecting banks, short-term funding markets, funds, pensions, insurance, corporates

Archegos, LDI: Critical combination of leverage, liquidity, concentration risks

- Archegos default, LDI funds stress: Excessive use of leverage, amid low liquidity and high concentration of positions
- Leverage-liquidity interplay: Leverage magnifies positions, amplifies liquidity risks
- Hidden spots: (1) Leverage difficult to observe for complex strategies; (2) macroprudential risks from common (uncoordinated) strategies or exposures by funds (e.g. UST cash basis), with patterns and cumulative impacts hard to assess ex-ante

EU Commission consultation: Next steps for NBFI policy

Commission consultation: Open approach to optimizing policy framework

- Policy issues: Liquidity, leverage, interconnectedness, public policy coordination
- Scope: Investment funds, MMFs, insurance, pension funds, other NBFIs and markets, incl. commodity markets, short-term funding markets

ESMA response: ESMA and NCAs to reflect on further improvements

- Backdrop: (1) State of NBFI markets in EU and global financial system, incl. size and diversity; (2) already well-functioning cooperation across EU authorities; (3) EU plans for more effective capital markets
- Reforms outstanding: Response to lessons from stress episodes, e.g. MMFs
- Tools for macroprudential interventions: Check need for more or different tools
- Risk assessment: Further refine and support risk assessment and monitoring, esp. on leverage, interconnectedness
- Cooperation on macroprudential policies: Enhance public policy cooperation, esp. on cross-border issues, crisis responsiveness
- Regulator perimeter: Addressing risk by NBFIs outside regulatory scope

ESMA
European Securities and Markets Authority

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