SUERF Panel
February 6, 2025

Where Do Banks End and NBFIs Begin?

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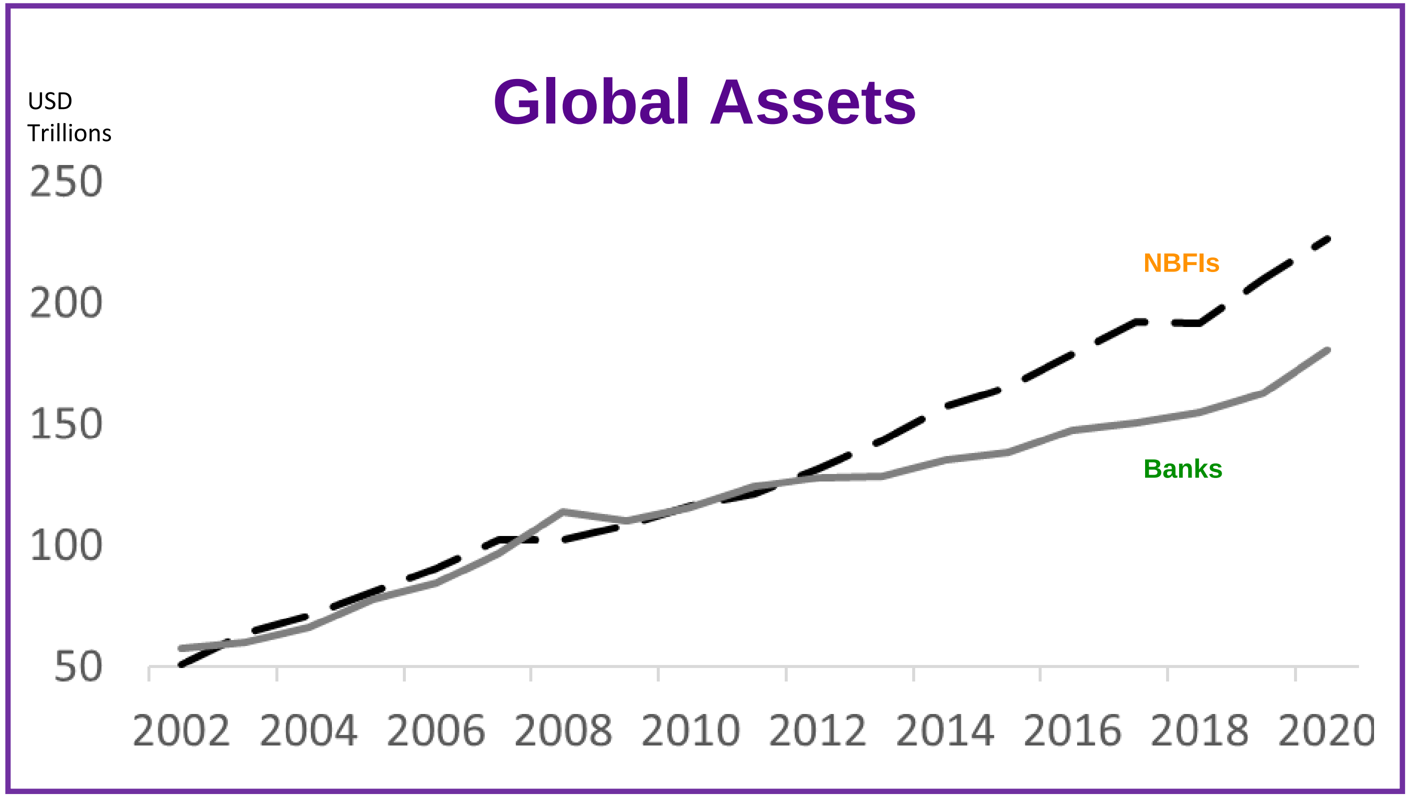
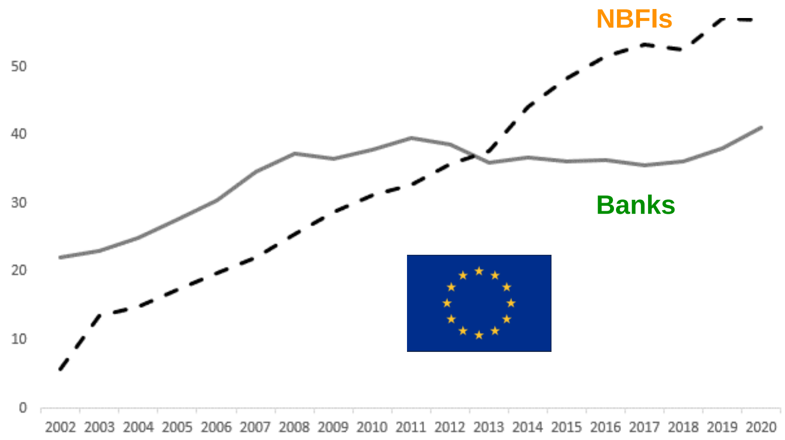
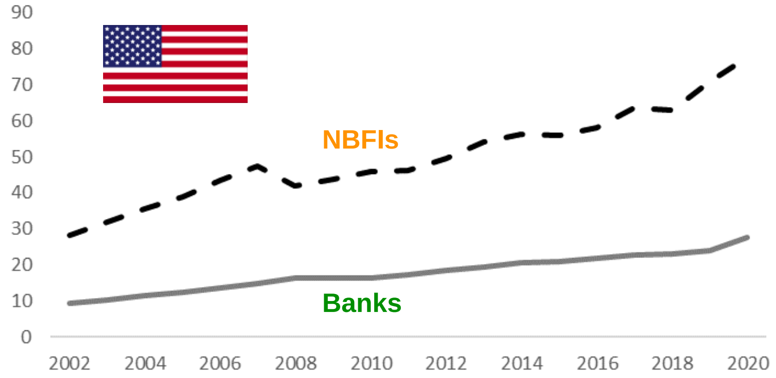
(with Nicola Cetorelli, Federal Reserve Bank of New York
and Bruce Tuckman, NYU Stern School of Business)

NBFIs Surpass Banks as Financial Intermediaries







Usual Views of the Bank and NBFI Sectors

- ***Parallel View***
  - Banks and NBFIs pursue different/parallel intermediation activities.
  - Banks focus on deposits, loans, and payments.
    - Banks are heavily regulated to protect depositors and the real economy.
  - NBFIs focus on capital markets.
    - NBFIs can be lightly regulated and allowed to fail.
- ***Substitution View***
  - Business lines and intermediation activities flow from banks to NBFIs
    - at least in part because of relatively burdensome bank regulation.
  - NBFIs take on intermediation roles that can be systemically important
    - and require rescue by authorities in times of stress.

Transformation View of Bank **and** NBFI Sectors

Transformation	Historically Within Banking	Spread Across Banks and NBFIs
<u>Loans and Mortgages</u> **Loans shift from being made and held by banks to being made by NBFIs with collateralized or senior financing provided by banks.**	• Corporate loans • Mortgage loans	• Banks make senior loans to private credit companies. • Banks make collateralized loans to mortgage REITs. • Banks hold senior tranches of MBS and CLOs.
<u>Activities Using Short-Term Funding</u> **Activities that require short-term funding transform from being conducted and funded by banks to being conducted by nonbanks and funded by banks.**	• Mortgage, CLO, and other ABS origination • Acquisition/LBO financing • Mortgage servicing	• Banks offer warehouse financing to nonbank mortgage, CLO, and other ABS originators. • Banks make short-term loans to private equity companies, including subscription finance loans. • Banks sponsor CP or directly lend to nonbank mortgage servicers.
<u>Contingent Funding</u> **While the footprint of NBFIs has grown relative to that of banks, banks retain responsibility for providing contingent funding in the form of credit lines to the NBFI sector.**	• Credit lines to nonfinancial businesses • OTC bilateral derivatives	• Banks provide credit lines to NBFIs to be drawn down during periods of stress. • Banks bear mutualized counterparty risk as derivative clearinghouse members and provide credit lines to NBFIs to meet margin requirements.

<u>Transformation View</u>

Intermediation trans-forms endogenously

i) to loosen regulatory constraints/ to reduce regulatory costs;

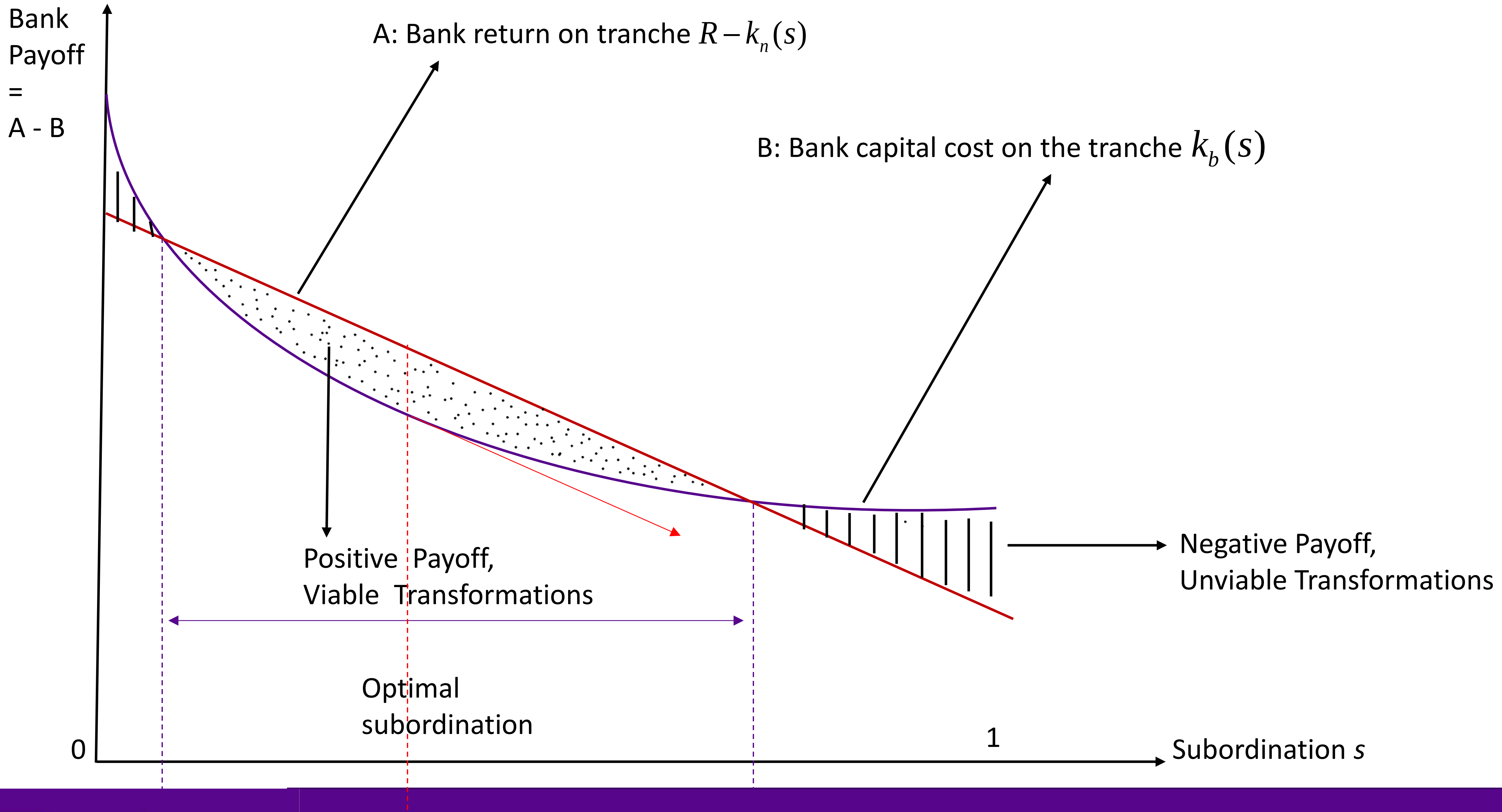
ii) to harness the funding and liquidity advantages of bank deposit franchises and access to safety nets.

Bank

Assets	Liabilities
Tranche (1-*s*) Yielding $R - k_n(s)$	**Bank Deposits** 1 - w(s) Costing $[1 - w(s)](\beta r_f - y)$
	Bank Equity w(s) Costing $w(s)(r_f + \pi_b)$

NBFI

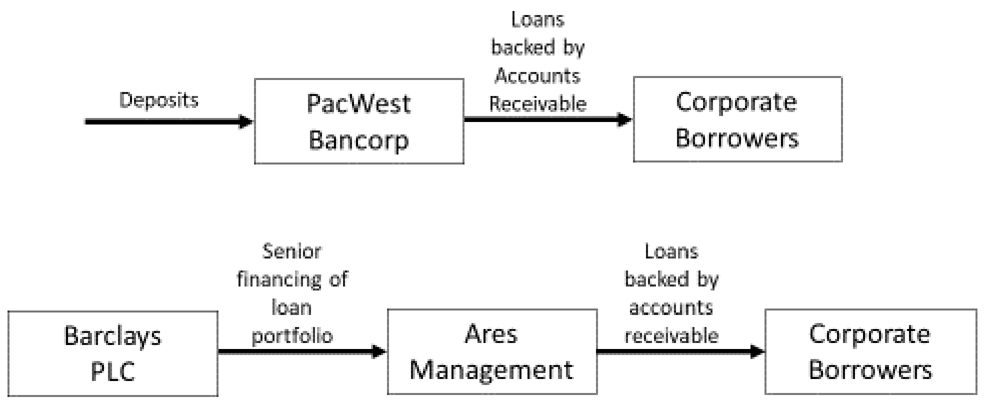
Assets	Liabilities
Assets Yielding R	**Tranche *1 – s*** Costing $R - k_n(s)$
	NBFI Equity *s* Costing $k_n(s) = (r_f + \pi_n)s$



Bank Payoff = A - B
A: Bank return on tranche $R - k_n(s)$
B: Bank capital cost on the tranche $k_b(s)$
Positive Payoff, Viable Transformations
Negative Payoff, Unviable Transformations
Optimal subordination
0
1
Subordination s

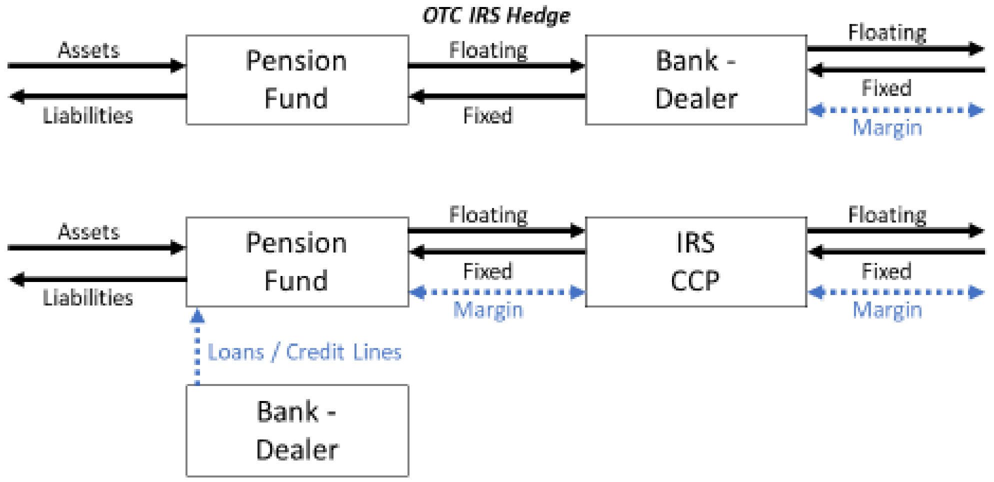
Two Examples of Transformations

Private Credit



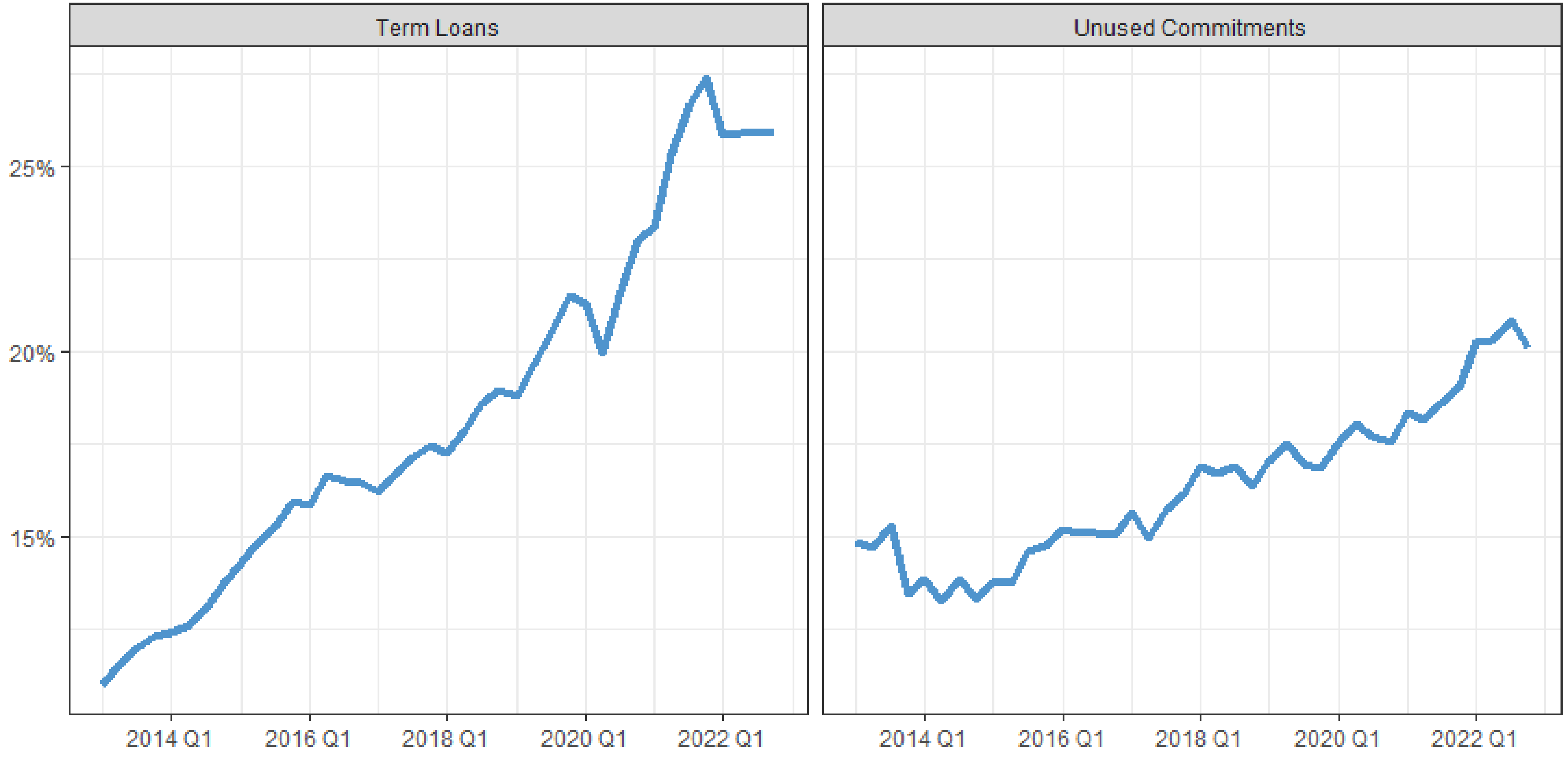
- Blackstone Private Credit Fund
  - more than $50 billion of assets
  - one of the largest private credit funds
  - committed facilities for $23.5 billion, almost all provided by 13 banks

Derivatives CCP Risk and Margin



- UK Pension Funds, Q1 2022
  - Rates up sharply in Sep 2023
  - Pensions well hedged; bank liquidity support…
  - …but had to dump Gilts to meet margin calls.
  - ➢ BoE intervenes in Gilt market

NBFI Share of Bank Loans and Commitments



Source: Form FR Y-9c

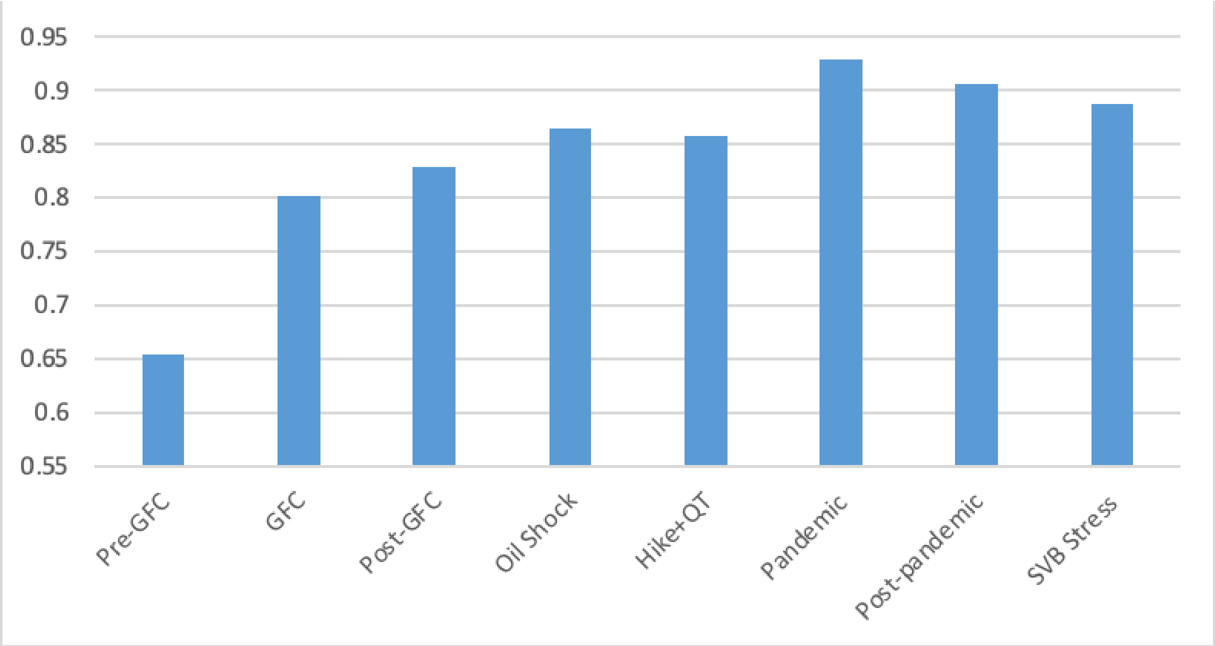
Matrix of Liability-Dependencies (FWTW)

ISSUERS	HOLDERS	NBFIs														
	Banks	ABS issuers	Broker/Dealers	Equity REITs	Finance Companies	GSE and Agency	Life Ins.	MMF	Mortgage REITs	Mutual Funds	Other Fin. Bus.	PC Ins.	Pensions	Real Sector	Rest of World	TOTAL
Banks	10	0	2	0	0	4	2	1	0	1	1	0	1	62	15	100
NBFIs: ABS Issuers	10	0	0	0	0	1	40	3	0	3	5	8	2	3	26	100
Broker/Dealers	25	0	24	0	0	2	0	8	0	1	0	0	0	11	29	100
Equity REITs	25	3	0	1	1	1	14	0	2	7	0	3	7	19	18	100
Finance Companies	15	0	0	0	0	0	11	0	0	7	1	3	6	22	33	100
GSE and Agency	35	0	1	0	0	3	3	9	2	6	0	1	4	21	15	100
Life Ins.	4	2	0	0	0	2	6	0	0	0	0	0	11	73	2	100
MMF	0	0	0	0	0	0	1	0	0	4	8	1	5	77	4	100
Mortgage REITs	8	0	13	0	0	3	8	10	0	6	0	2	5	7	38	100
Mutual Funds	0	0	0	0	0	0	8	0	0	0	0	0	27	59	6	100
Other Fin. Bus.	3	0	54	0	0	0	2	1	0	1	7	0	4	25	2	100
PC Ins.	1	0	0	0	0	0	1	0	0	0	0	8	2	74	13	100
Pensions	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	100
Real Sector	14	1	1	0	1	9	3	1	0	3	0	1	11	37	19	100
Rest of World	22	0	3	0	3	1	7	3	0	5	1	3	4	48	0	100

- Banks are somewhat dependent on the NBFI sector as a whole, but not on individual NBFI sectors.
- Several NBFI sectors are significantly dependent on banks.
- NBFI sectors are generally not significantly dependent on each other.
- These conclusions also hold for asset-dependence (shown in paper).

Bank-NBFI Systemic Risks: Correlation/Causation

20-day Rolling Correlations
Bank and NBFI % Changes in Sector-Wide SRISK



Granger-Causality Tests
Bank and NBFI Abnormal Returns

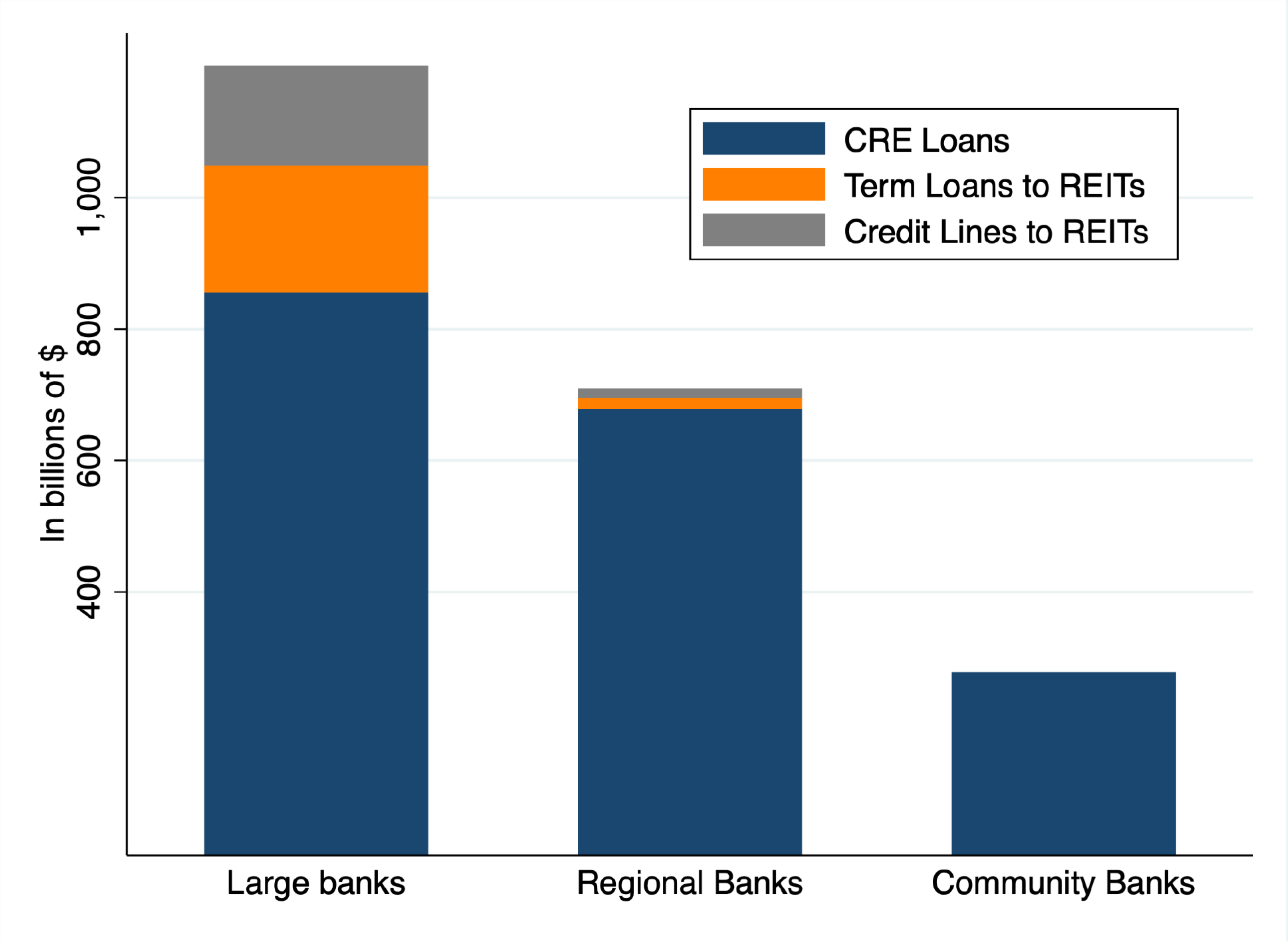
	Fraction of days w p-value <10% when	
Period	Banks cause NBFIs	NBFIs cause Banks
Pre-GFC	13%	5%
GFC	33%	25%
Post-GFC	18%	18%
Oil Shock	9%	0%
Rate Hike + QT	13%	15%
Pandemic	36%	31%
Post-Pandemic	26%	67%
SVB Stress	24%	62%

Implication I: Linkages, risk spillovers, co-movement

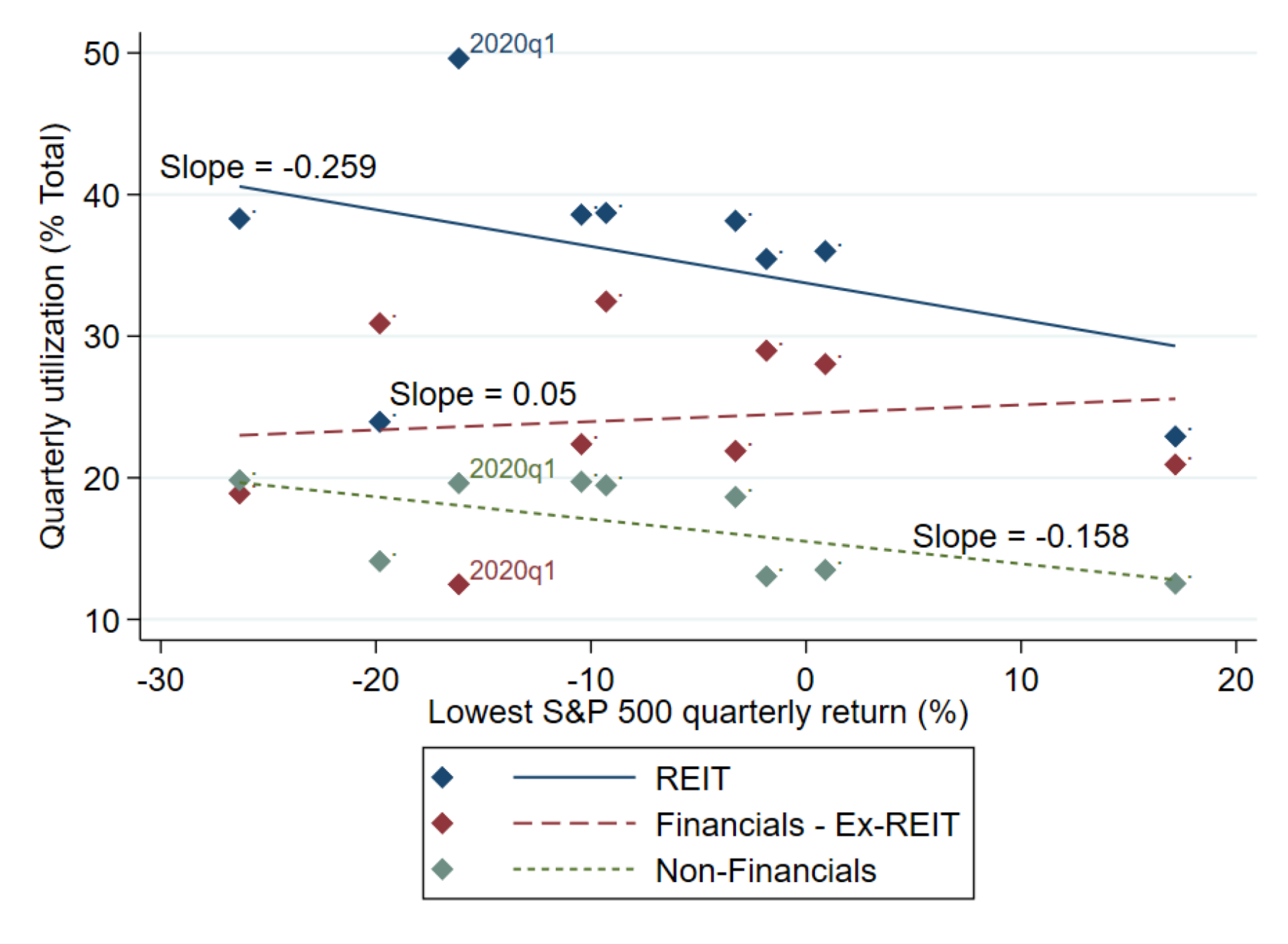
Shadow Always Touches the Feet: Implications of Bank Credit Lines to Non-Bank Financial Intermediaries

Viral V. Acharya, Manasa Gopal, Maximilian Jager, Sascha Steffen
September 6, 2024

Banks' Total Exposure to CRE

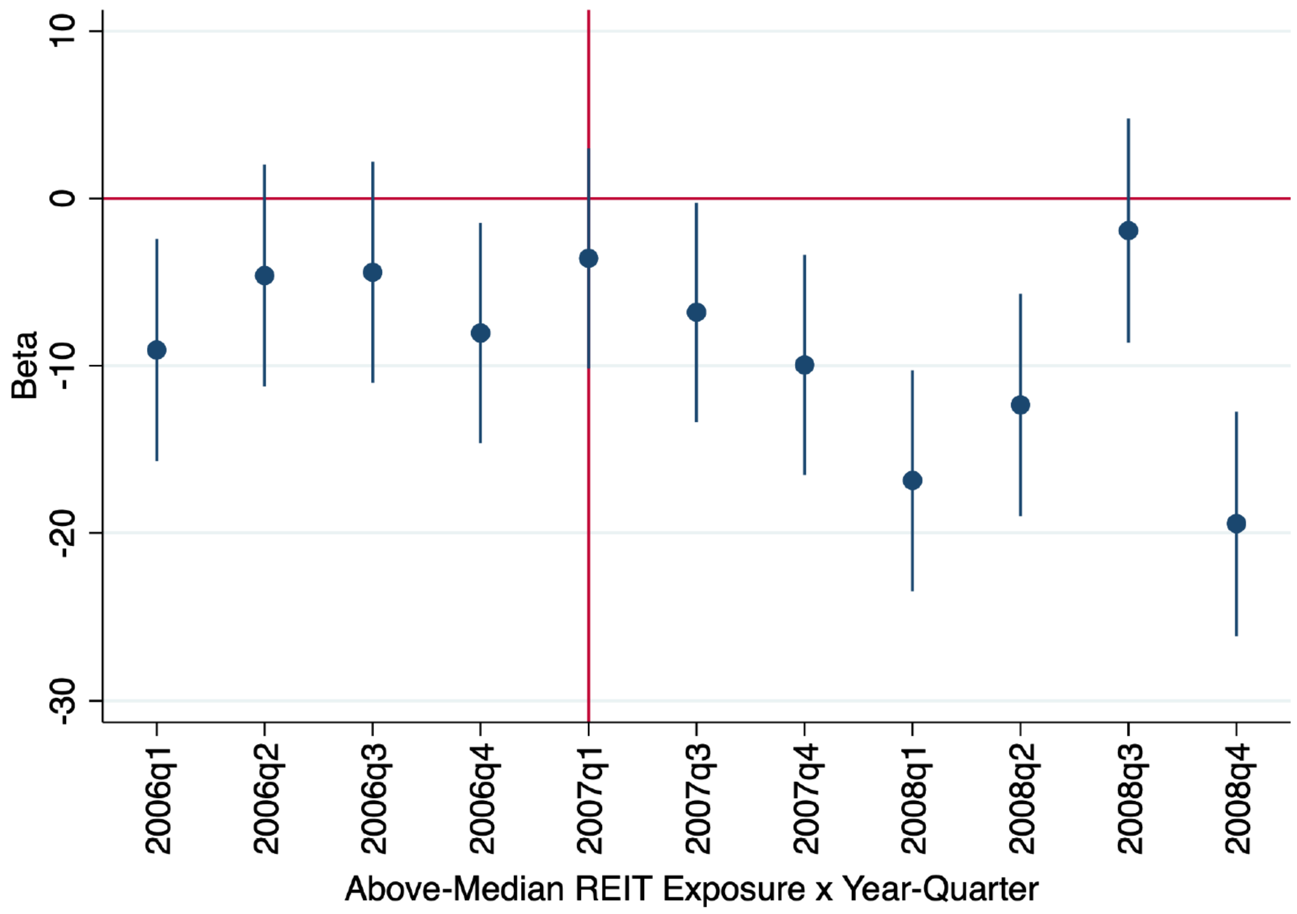


Utilization rates of REITs vs other borrowers in crises



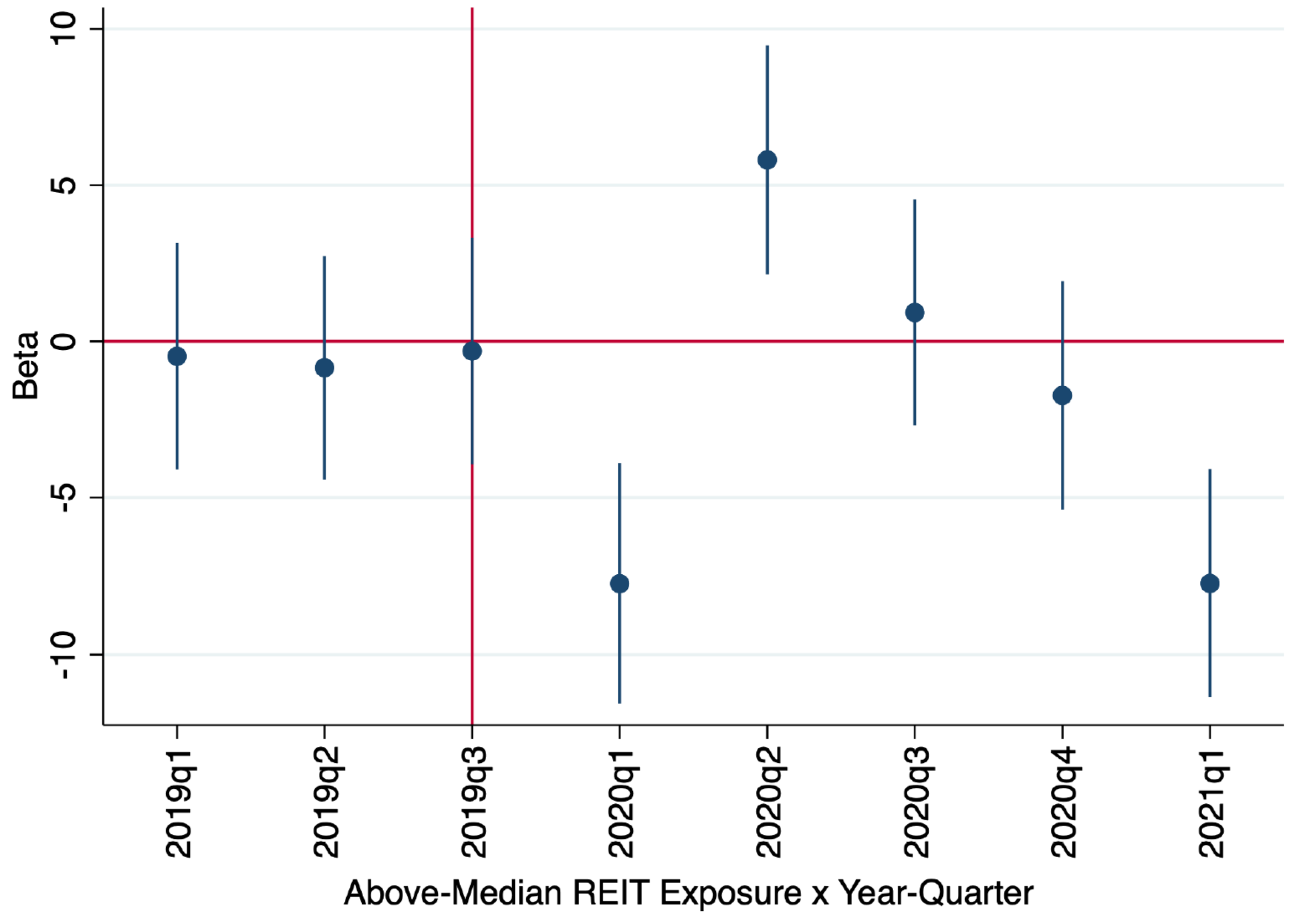
Bank Performance by REIT Exposure - GFC

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



Bank Performance by REIT Exposure - COVID-19

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



Inplication II: Monitor / regulate NBFI liquidity risk

(Goodhart's Law of Banking Regulatory Perimeter)

Possible Regulatory Responses

- *Ex-Ante*
  - Holistically monitor and supervise banks and NBFIs.
    - ECB (2023), FDIC (2019), FSB (2022); CFTC (2019), BoE (2022)
  - Induce banks and NBFIs to internalize systemic risks.
    - Narrow the scope for regulatory arbitrage.
    - **Committed Liquidity Facilities** (Nelson, 2023)
    - **Pawnbroker for all Seasons** (King, 2016)
    - **Federal Liquidity Options** (Tuckman, 2012)
- *Ex-Post*
  - State-contingent responses to NBFI stress (pre-announced and credible).
    - NBFIs receiving LOLR become *prima facie* SIFIs (Acharya, 2022)
    - or become subject to corrective action, e.g., deleveraging (Acharya and Tuckman, 2014)

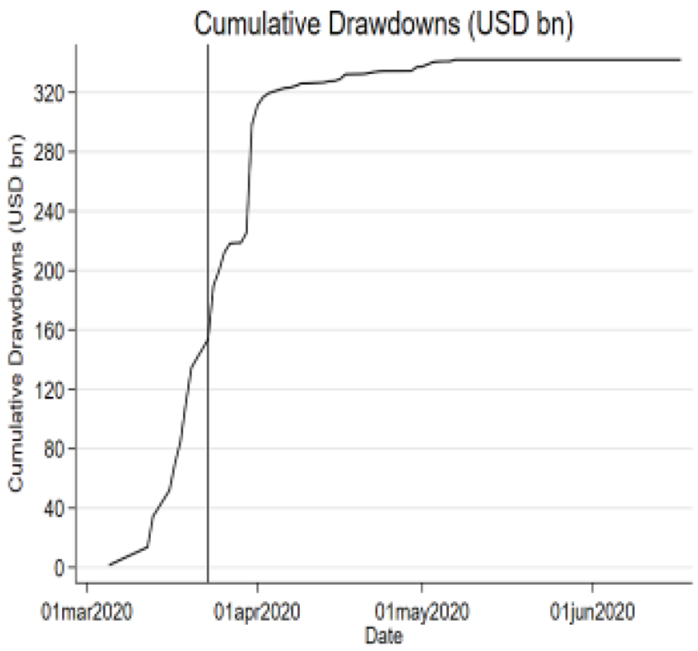
Implication III: Bank provision of liquidity to firms

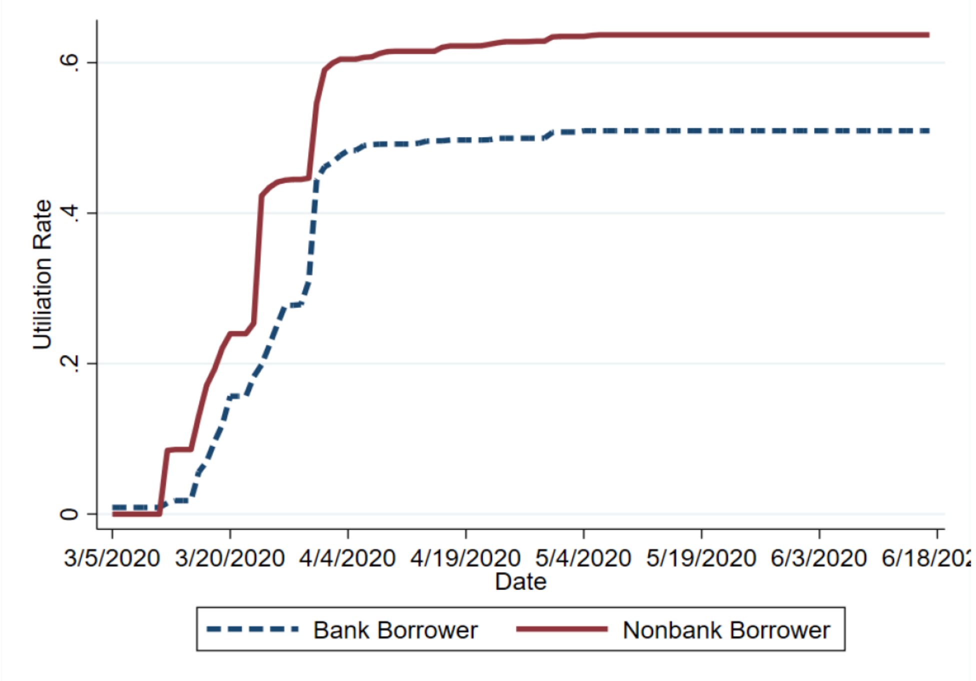
Fragile Financing? How Corporate Reliance on Shadow Banking Affects Bank Provision of Liquidity

Viral Acharya[1] Manasa Gopal[2] Sascha Steffen[3]

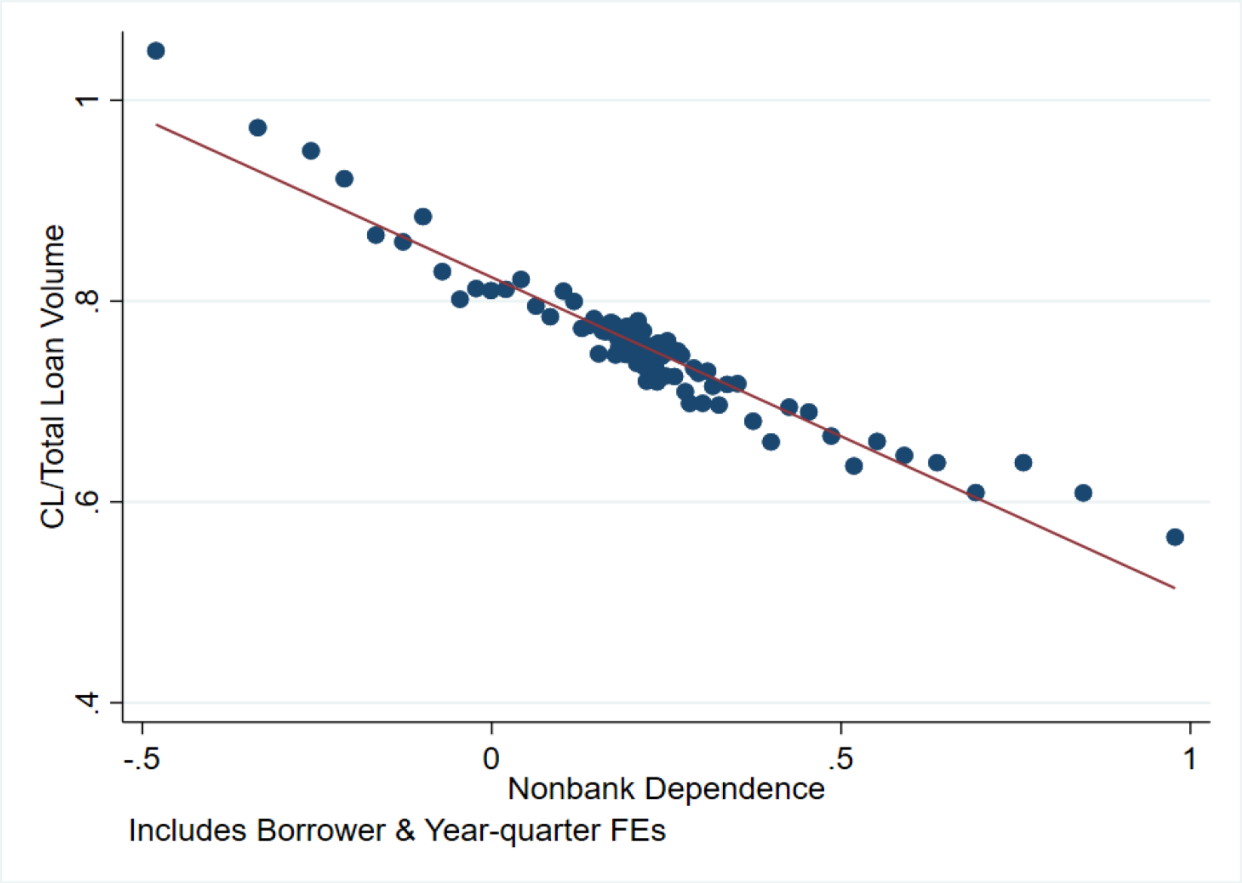
Motivation: COVID-19

- Firms drew down heavily on credit lines (Acharya and Steffen, 2020) - $320 billion drawndown within weeks
- Nonbank borrowers drew down more - Capital markets shut down early in the COVID-19 pandemic - Shadow banking funding more fragile



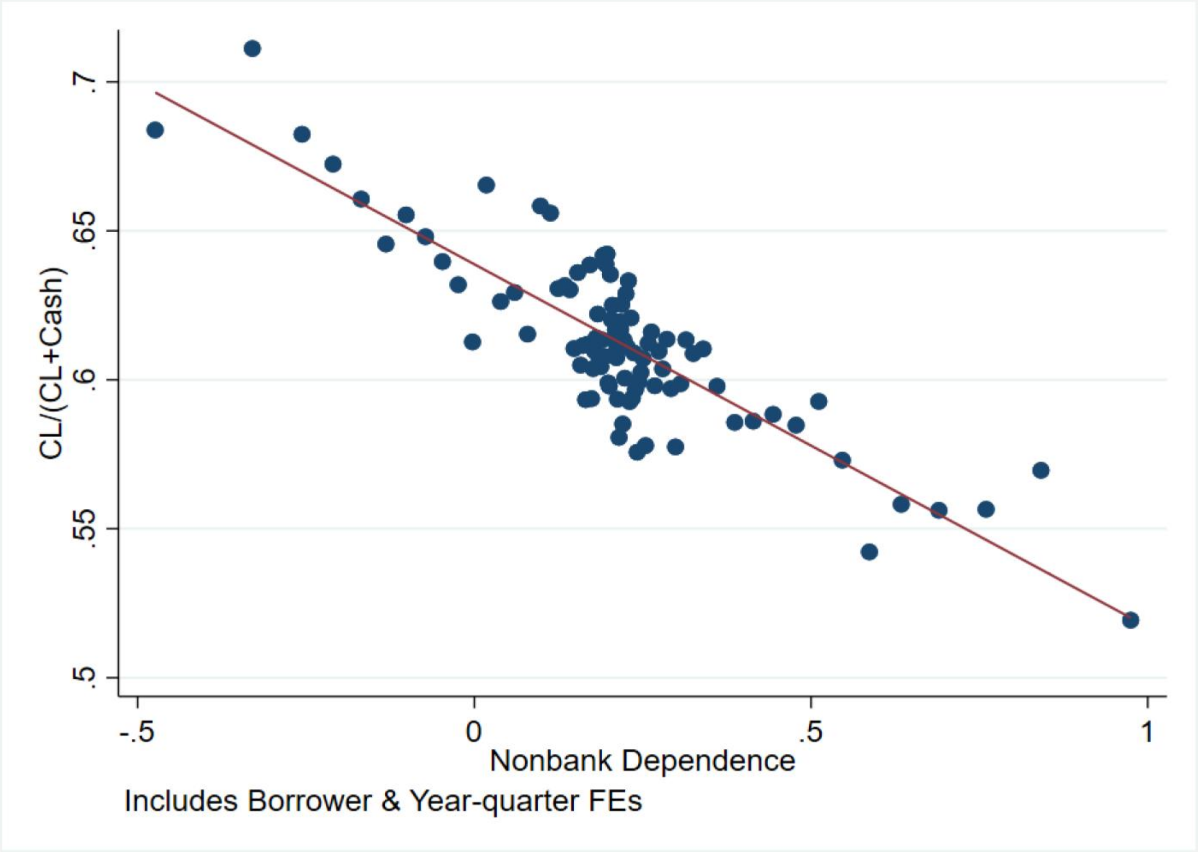


Access to Credit Lines for Nonbank Borrowers



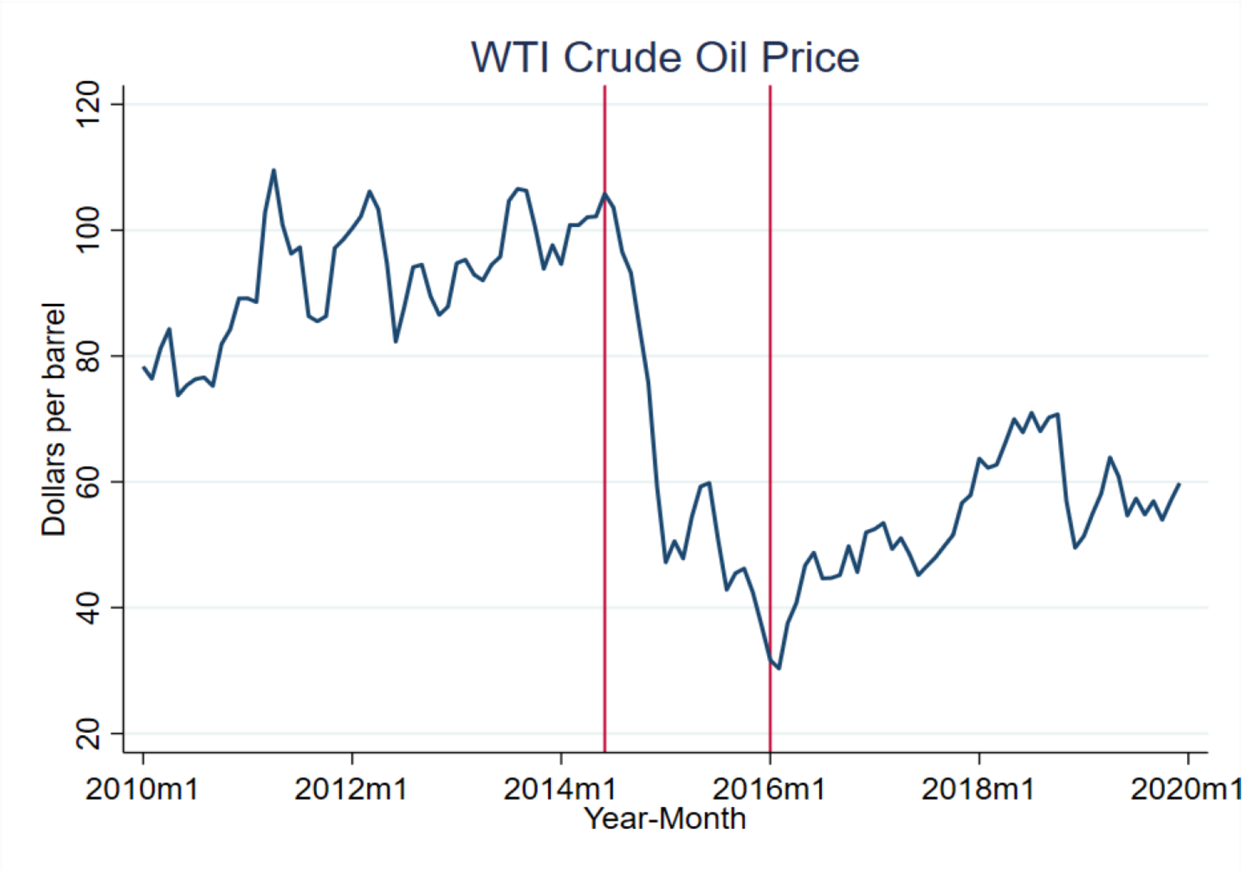
- Firms that have a higher nonbank dependence receive lower levels of credit lines

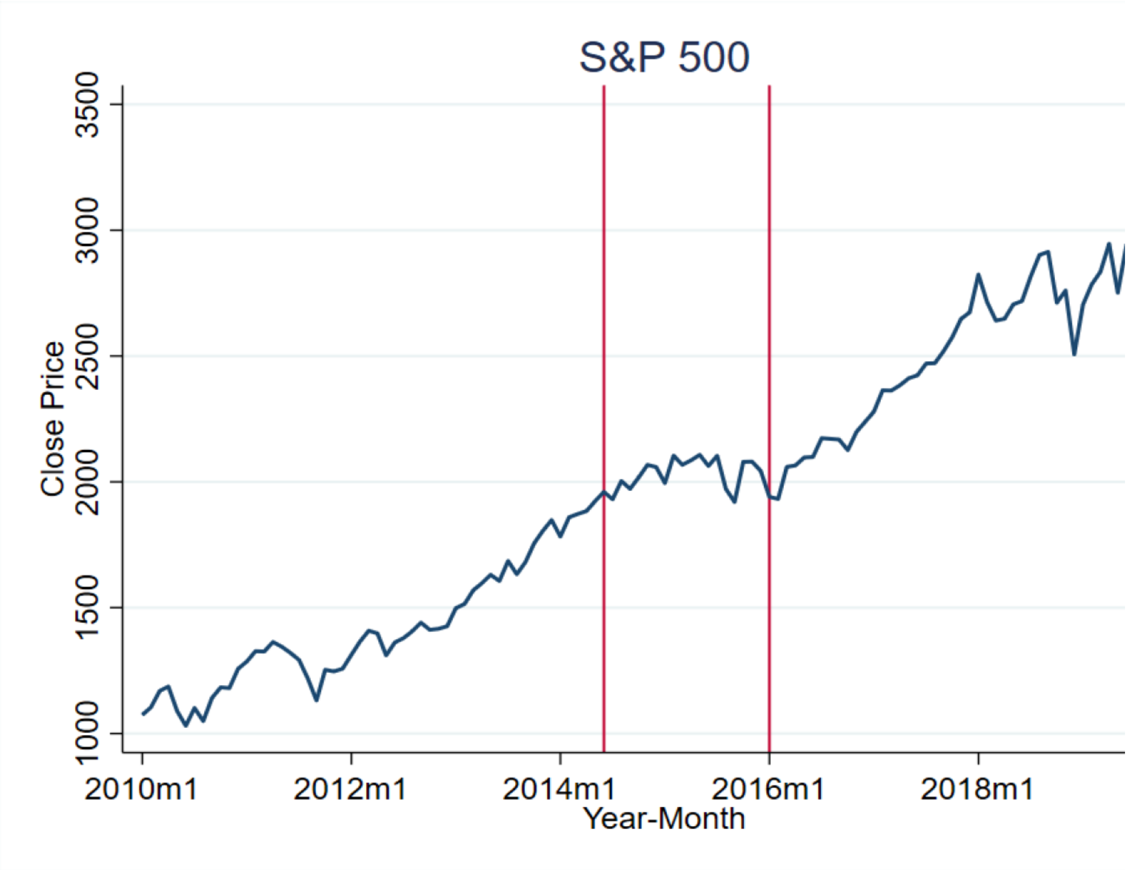
Liquidity Management of Nonbank Borrowers



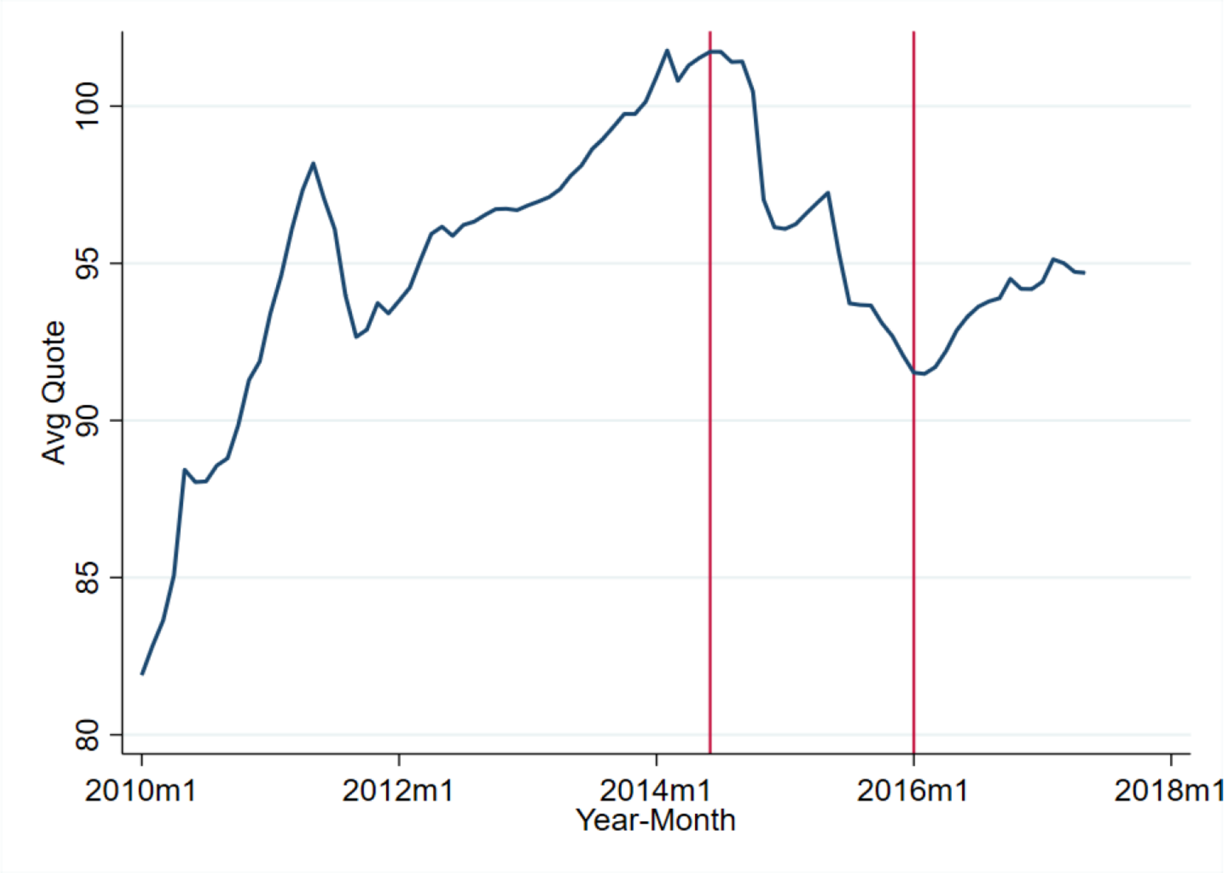
- Firms that have a higher nonbank dependence use proportionally more cash in liquidity management

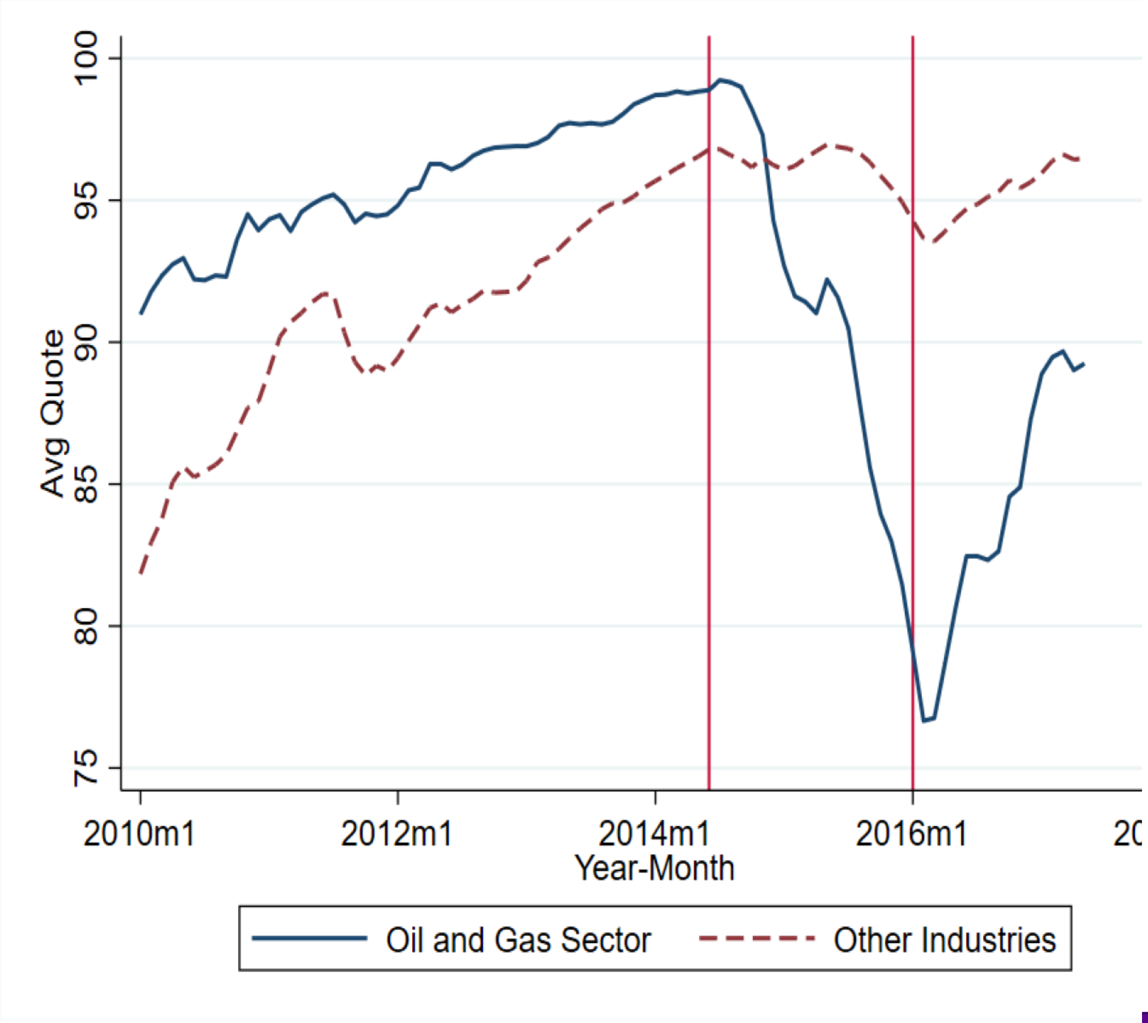
Oil price shock - (No) Stock market response



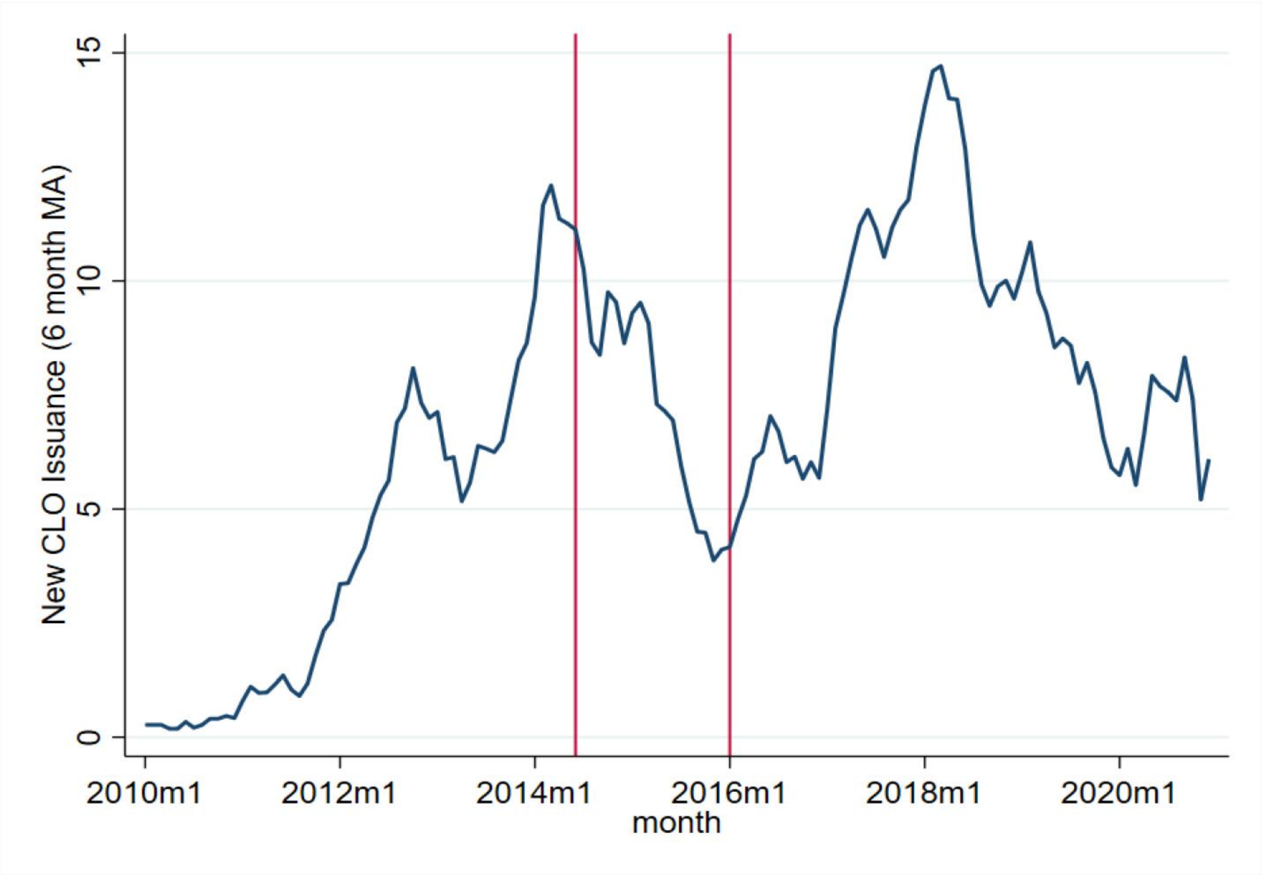


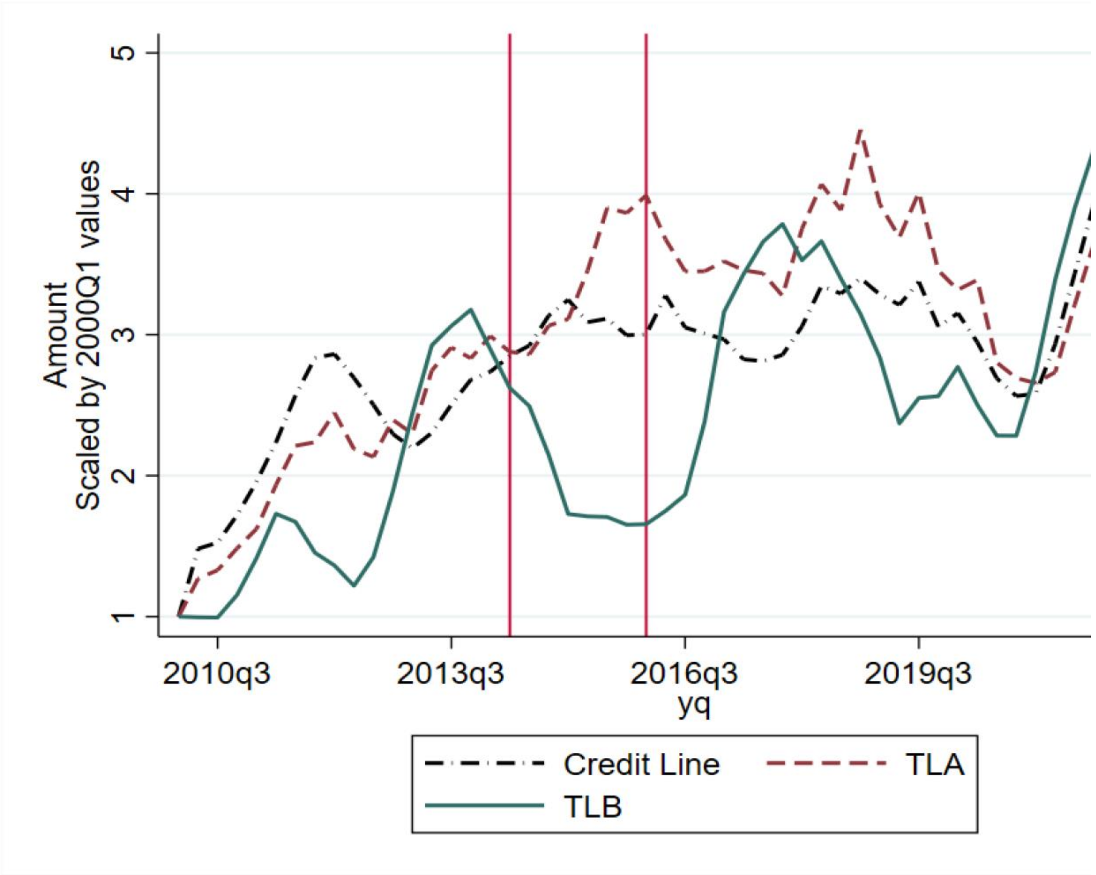
Oil price shock - Loan market response



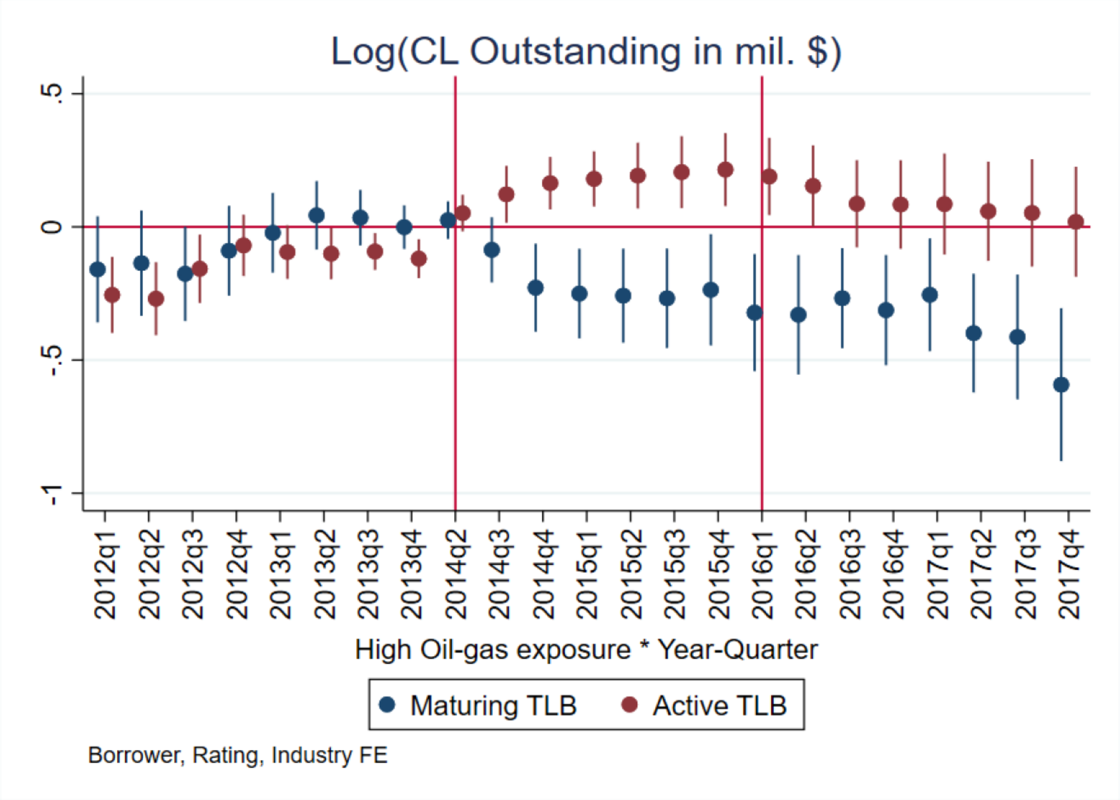


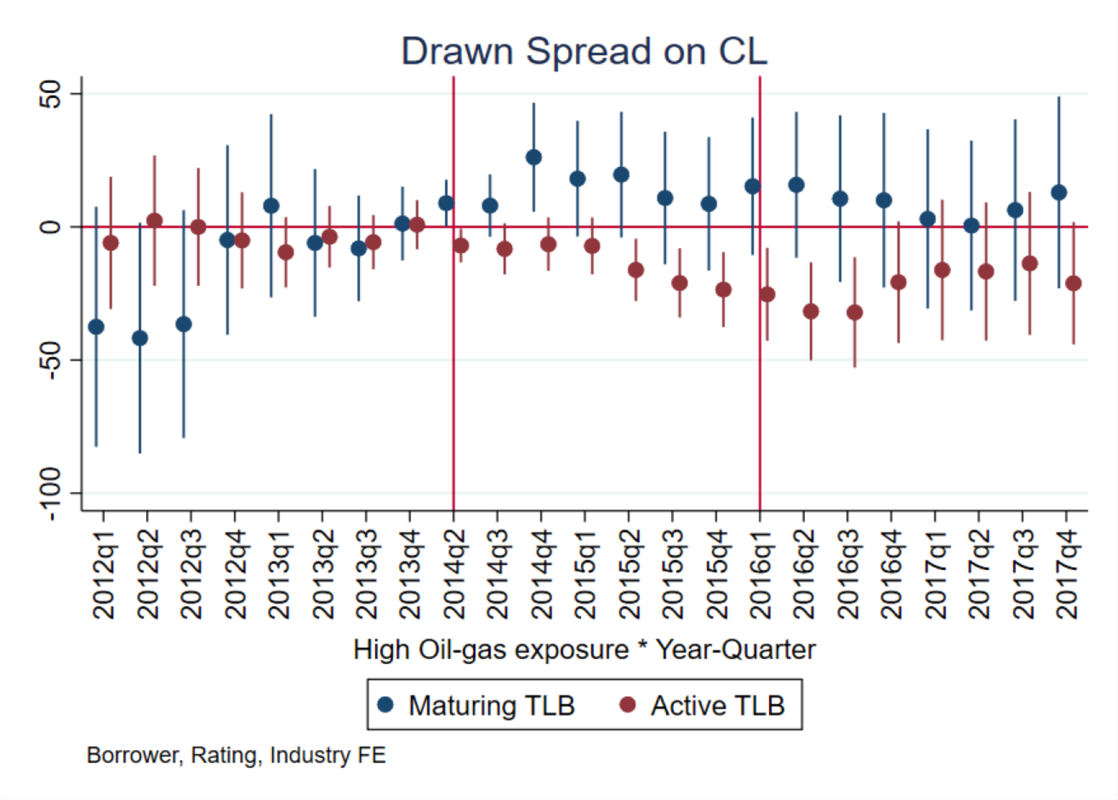
Oil price shock - Loan Issuance





Oil Price Shock - Impact on Credit Lines





- Supply of credit lines increases for borrowers with no rollover risk but exogenous reduction in nonbank reliance while it falls for borrowers facing rollover risk