Where Collateral Sleeps

Gary B. Gorton[1]   Chase P. Ross[2]   Sharon Y. Ross[2]

[1]Yale & NBER

[2]Federal Reserve Board

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OVERVIEW

- In a bank run, Bagehot dictates a central bank should lend freely (1) against good collateral, (2) at a penalty rate, and (3) to solvent banks

- But where is the collateral?

- Bank runs are likely getting faster (Rose 2023), so good collateral in the wrong place is no different than no collateral at all

- Banks can borrow quickly from the discount window if they voluntarily *pre-position* assets with the Fed

- Pre-positioning allows banks to insure against runs, but it can be costly

Use two datasets to study the quantity and composition of collateral pre-positioned with the Fed

WHY IS PRE-POSITIONING HELPFUL?

- Pre-positioning allows banks to quickly borrow from the discount window:

  (1) The discount window lends only against collateral the Fed has valued, which can take time (up to several weeks) → valuation done in advance when pre-positioned

  (2) Less reliance on third-party financial plumbing, like custodial banks or payment systems, since pre-positioned assets are held with the Fed (directly or indirectly)

- First-order important in March 2023:

  [SVB] had limited collateral pledged to the Federal Reserve's discount window, had not conducted test transactions, and was not able to move securities collateral quickly from its custody bank or the [Federal Home Loan Bank] to the discount window. (Barr, 2023)
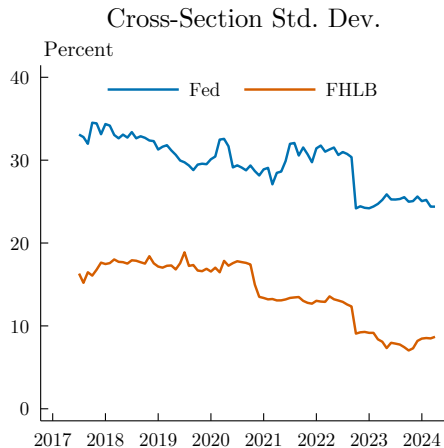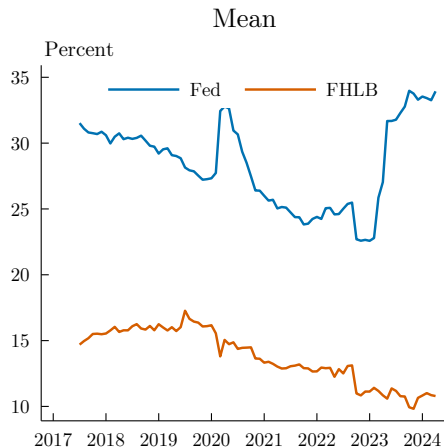
RESULTS

Guided by a toy model, we compare the forces that drive pre-positioning:

(1) the bank's expectations about the future

- Pre-position more in bad times and when they have more uninsured deposits

(2) the opportunity cost from pre-positioning

- Banks pre-position assets that have the lowest value in other collateral markets

- And their choices respond quickly to repo haircuts and financing spreads

(3) stigma, both (1) borrowing stigma and (2) pre-positioning stigma—related but distinct types of stigma

- Banks pre-position less when they are more exposed to borrowing stigma

- Riskier banks voluntarily disclose pre-positioning (signal outweighs stigma cost)

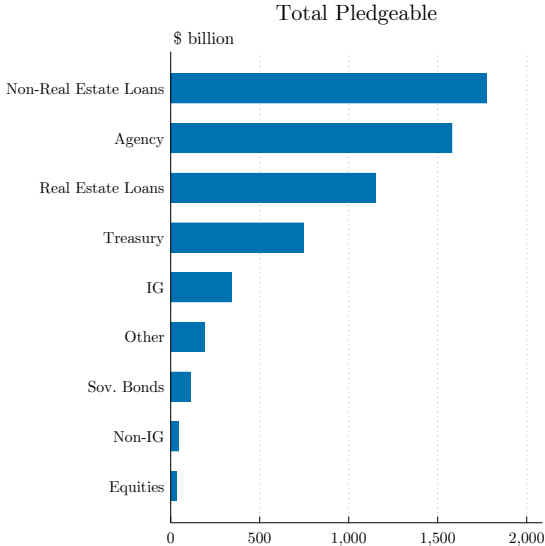- Uninsured-deposit flows causally drive prepositioning

Data

① Federal Reserve 2052a *Complex Institution Liquidity Monitoring Report*

- Balance sheet data on three dozen of the largest U.S. banks and U.S. operations of large foreign banks from 2016 to 2024

- Covers $1.9 trillion of pre-positioned assets, 80% of all pre-positioned collateral

- Daily data for U.S. GSIBs, monthly data for rest

② Manually collected pre-positioning data from banks' 10-Ks (ChatGPT helped)

- Collect data from >25,000 bank 10-K/Qs back to 1995

Measuring Banks' Pre-positioning: Capacity Ratio$_t^{Fed}$

$$\text{Capacity Ratio}_t^{Fed} = \left(\frac{\text{Pre-positioned Collateral at Fed}}{\text{Unencumbered Assets} + \text{All Pre-Positioned Collateral}} \right)_t$$

Mean

Cross-Section Std. Dev.

Banks' Pre-positioning by Collateral Type

Capacity Ratio
Percent

- Real Estate Loans
- Non-Real Estate Loans
- IG
- Other
- Treasury
- Agency
- Non-IG
- Sov. Bonds
- Equities

Legend:
- Fed
- FHLB
- Other

Axis: 0, 20, 40, 60, 80

Total Pledgeable
$ billion

- Non-Real Estate Loans
- Agency
- Real Estate Loans
- Treasury
- IG
- Other
- Sov. Bonds
- Non-IG
- Equities

Axis: 0, 500, 1,000, 1,500, 2,000

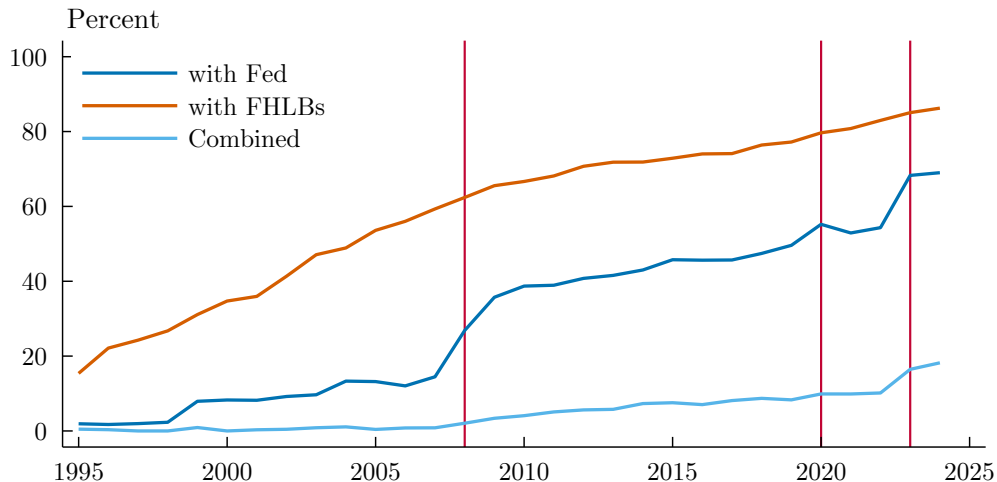**Borrowing Stigma: from actually borrowing from the window**

$$\text{District Asset Share}_t^i = \frac{\text{Bank } i \text{ Assets}_t}{\text{Total Bank Assets in Same District}_t}$$

- Intuition: harder for larger banks in a district to conceal their borrowing $\rightarrow$ more exposed to borrowing stigma

Pre-positioning Stigma: from disclosing pre-positioning with the Fed

- It can indicate a potential willingness to borrow from the window, and increased pre-positioning could signal that the bank has grown riskier
- Most banks either (1) report only combined Fed and FHLB pre-positioning, or (2) don't report anything
- Banks have negative returns after they begin disclosing Fed pre-positioning

Share of Banks Reporting Fed Pre-positioning in 10-Ks

Percent

Legend:
- with Fed
- with FHLBs
- Combined

	Fed Disclosures				
	Capital Ratio$_t^b$	Uninsured Share$_t^b$	Loan-to-Deposit$_t^b$	ROA$_t^b$	ln(Assets)$_t^b$
$\mathbb{I}$(Disclose Fed Pre-positioning$_t^b$)	-0.98^{***}	1.62^{***}	2.93^{***}	-0.04^{**}	0.27^{***}
	(-6.92)	(6.30)	(14.49)	(-2.52)	(12.60)
N	37,115	29,043	38,167	38,168	38,168
Within R^2	0.00	0.00	0.00	0.00	0.00
Time Fixed Effect	Yes	Yes	Yes	Yes	Yes

- Banks that disclose have lower capital ratios, more uninsured deposits, more loans relative to deposits, and lower ROA

- The benefit of signaling that the bank has bought pre-positioning insurance outweighs the stigma cost only for riskier banks

Comparing Pre-positioning Forces

We jointly compare the forces that could drive pre-positioning using measures of the probability of a bad state, the alternative collateral market, and stigma

$$
\text{Capacity Ratio}_t^b = \alpha + \overbrace{\beta_1 (\text{Baa} - \text{Aaa})_t + \beta_2 (\text{Deposits}_t^b)}^{\textit{Bad state risk}}
$$
$$
+ \underbrace{\beta_3 (\text{PCR} - \text{SOFR})_t + \beta_4 (\text{Treasury Repo Haircut}_t^b)}_{}
$$

Alt. collateral market

$$
+ \beta_5 \left(\text{District Asset Share}_t^b \right) \quad \textit{Borrowing stigma}
$$
$$
+ \gamma^b + \delta_t + \varepsilon_t^b
$$

Sizing the Pre-positioning Forces

	Large Banks (Daily)		All Banks (Monthly)	
	(1)	(2)	(3)	(4)
Bad State Risk				
$Baa - Aaa_t$	1.21**		−0.04	
	(2.33)		(−0.07)	
Insured Deposits$_t^b$	−8.11***	−4.36	−12.63***	−7.97***
	(−4.34)	(−1.53)	(−8.73)	(−4.04)
Uninsured Deposits$_t^b$	10.04***	10.39***	6.10***	10.64***
	(5.70)	(6.07)	(4.61)	(7.37)
Alternative Collateral Market				
$PCR_t - SOFR_t$	−0.70**		−0.99***	
	(−2.22)		(−2.75)	
Treasury Repo Haircut$_t^b$	0.75***	1.37***	0.32	1.11***
	(2.85)	(4.42)	(0.93)	(3.11)
Stigma				
District Asset Share$_t^b$	−10.35***	−12.10***	−6.29***	−7.40***
	(−3.24)	(−3.66)	(−4.85)	(−5.66)
Controls				
Unrestricted Reserves$_t^b$		−4.41**		−9.55***
		(−2.56)		(−4.07)
N	16,584	16,792	2,022	2,022
R^2	0.11	0.12	0.25	0.33
Time FE	No	Yes	No	Yes
Bank FE	Yes	Yes	Yes	Yes

Effect of deposit flows on prepositioning

- Granular IV
  - Motivated by Kubitza, Sigaux, and Vandeweyer (2025) implementation of Gabaix and Koijen (2024)
  - Idiosyncratic deposit flows $\rightarrow$ aggregate deposit flows $\rightarrow$ Δ Capacity

- Data granularity
  - month $\times$ bank $\times$ $\underbrace{\text{depositor type} \times \text{deposit account type} \times \text{maturity}}_{d=\text{depositor category}}$

- Identifying assumptions
  - depositors within a category have similar behavior
  - deposits are concentrated in depositor categories

GRANULAR IV

$$\Delta D_{bdt} = \frac{Deposits_{bdt} - \overline{Deposits_{bdt}}}{\overline{Deposits_{bdt}}}$$

- Residualize ΔD_{bdt} to get idiosyncratic deposit flows

$$\Delta D_{bdt} = \alpha_b + \gamma_t + \delta_d + \lambda_{d \times t} + \check{d}_{bdt}$$

- Granular instrument

$$GIV_{bt} = \underbrace{\sum_d w_{bdt} \check{d}_{bdt}}_{\text{size-weighted}} - \underbrace{\frac{1}{N} \sum_d \check{d}_{bdt}}_{\text{equal-weighted}}$$

- Granular IV: idiosyncratic deposit flows → agg deposit flows → Δ Capacity

$$\Delta D_{bt}^U = \beta GIV_{bt}^U + X'C_t + \eta_b + \theta_t + \varepsilon_{bt}$$

$$\Delta \text{Capacity}_{bt} = \gamma \Delta \hat{D}_{bt}^U + X'C_t + \eta_b + \theta_t + \varepsilon_{bt}$$

Second Stage: $\Delta\text{Capacity}_{bt} = \gamma\Delta\hat{D}_{bt} + X'C_t + \eta_b + \theta_t + \varepsilon_{bt}$

	$\Delta\text{Capacity}_{bt}$		
	(1)	(2)	(3)
$\Delta\text{Uninsured Deposits}_{bt}$	−0.80***		−0.70***
	(−2.84)		(−2.95)
$\Delta\text{Insured Deposits}_{bt}$		−0.00	−0.01
		(−0.03)	(−0.12)
N	2,407	2,406	2,406

- 1 standard deviation deposit outflow (3%) → 2.4pp increase in prepositioning

Results in a nutshell

① Banks' pre-positioning is deliberate and responds to market forces

② Run-prone uninsured-deposit flows causally drive prepositioning

③ Pre-positioning itself is likely stigmatizing if disclosed, yet can be a useful signal for risky banks

Informing Policy Design

- Many banks are buying insurance (✔), perhaps not as much as we want (✗), and often keep it private (✗)

- We are better off if banks buy insurance and everybody knows