

How (In)effective was Bank Supervision during the 2022 Monetary Tightening?

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The views expressed herein do not necessarily represent the views of the St. Louis Fed or Federal Reserve System

Background: Crisis of the U.S. Regionals

- Simple combination of events leading to the collapse of Silicon Valley Bank (SVB) and First Republic Corporation:
 - 1 Large exposures to long-term securities that lost significant market value as the Federal Reserve began raising interest rates during 2022
 - 2 Classification of large portion of securities as HTM allowed banks to avoid marking down these securities on their balance sheets
 - 3 Excessive reliance on uninsured depositors exposed these bank to liquidity risks that materialized in the first quarter of 2023

Motivation

“Where were the regulators? The Dodd-Frank Act added hundreds of thousands of pages of regulations, and an army of hundreds of regulators. The Fed enacts “stress tests” in case regular regulation fails. How can this massive architecture fail to spot basic duration mismatch and a massive run-prone deposit base?”

— John Cochrane

- Many potential explanations for regulatory failure:
 - Supervisors did not understand the risks that were emerging
 - Supervisors lacked discretionary powers
 - Scarce supervisory resources
 - Regulatory Forbearance
- Difficult to evaluate regulatory performance because the process is shrouded in secrecy. What are the facts?

This Paper

[Empirical Approach:] Use confidential CAMELS ratings data to learn about what regulators did and did not do during the monetary tightening of 2022

[Research Questions:]

- 1 Did supervisors downgrade banks with large interest rate risk exposures? When?
- 2 Did supervisors downgrade banks with excessive reliance on unstable sources of funding? When?
- 3 Did supervisors respond differently to unrealized losses on banks' securities portfolios depending on their accounting classification?
- 4 Did rating downgrades help curb interest rate and liquidity risks?

[Policy:] How do we interpret the collection of facts and what can be improved?

Summary of Main Results

- 1 Supervisors more likely to downgrade banks most exposed to interest rate risks but only after the second quarter of 2022
- 2 Supervisors not more likely to downgrade banks with greater reliance on unstable sources of funding
- 3 Supervisors faster to downgrade exposures to unrealized AFS losses than they were to downgrade exposures to unrealized HTM losses
- 4 A supervisory downgrade is associated with a reallocation from marketable securities to cash in the amount of 0.5% of total assets

[Back of the Envelope:]

- If regulators had started downgrading two quarters earlier, they would have “saved” \$9.44 billion and .9% of the Tier 1 Capital of the banks that otherwise were not downgraded

→ **Consistent with supervisors having some understanding of interest rate risks but acting too late and lacking discretionary powers to correct deficiencies**

Related Literature

Interaction between Monetary Policy and Bank Supervision

- Peek, Rosengren, and Tootell (1999, QJE); Ioannidou (2005, JFI)

Banking Supervision and Financial Stability

- Agarwal et al. (2014, QJE); Costello, Granja, and Weber, (2019, JAR); Hirtle et al (2020, JF); Kandrach and Schlusche (2021, RFS); Eisenbach, Lucca, and Townsend (2022, JF); Bonfim et al. (2023, M.Sc); Granja and Leuz (2024, JFE forthcoming)

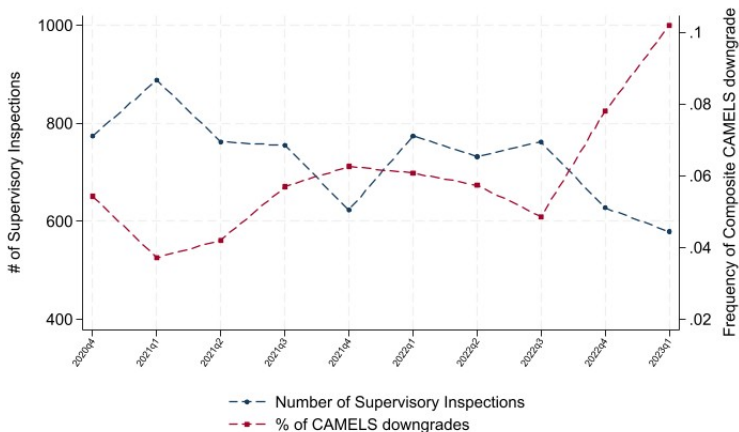
Regional Banking Crisis of 2023

- Dreschler et al (2023, WP); Jiang et al. (2023, WP); McPhail et al. (2023, WP); Granja et al, (2024, WP); Cookson et al. (2023, WP); Choi et al. (2023, WP); Caglio et al. (2023, WP); Kim et al. (2023, WP);

Outline

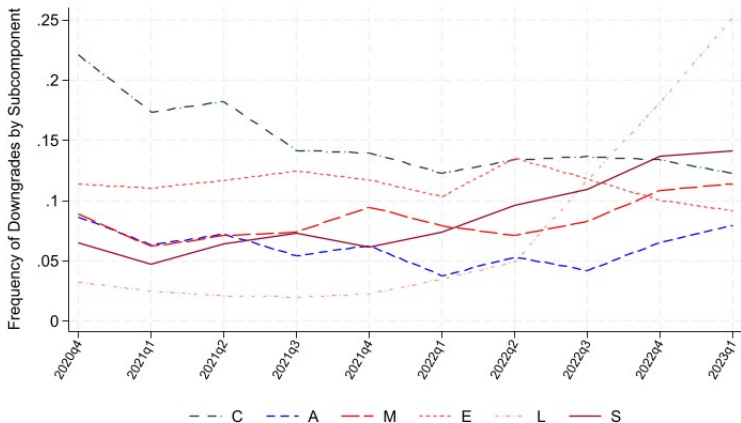
- **Descriptive Statistics**
- Bank Supervision and Interest Rate Risk
- Bank Supervision and Unstable Sources of Funding
- Bank Supervision and HTM Accounting
- Heterogeneity and Portfolio Allocations
- Policy Discussion

Descriptive Statistics: CAMELS Composite Rating



■ # of inspections stable but % of downgrades ↑ in 2022:Q4 and 2023:Q1

Descriptive Statistics: CAMELS Subcomponents

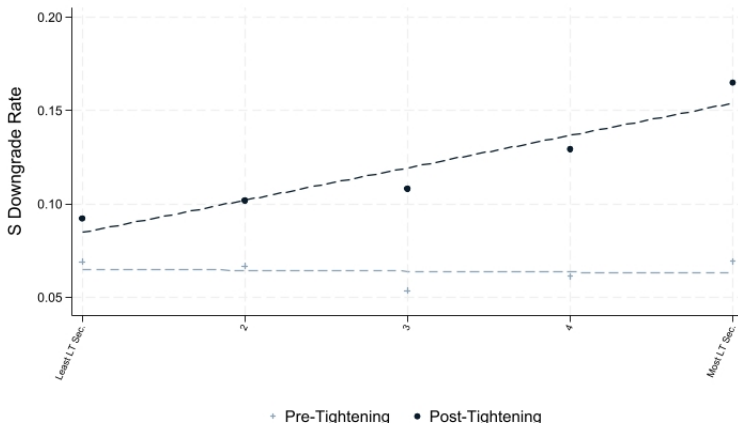


- ↑↑ in “(L)iquidity” downgrades since 2022:q2 and sustained ↑ in “(S)ensitivity to risk” downgrades since 2021:q4

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Interest Rate Risk: Univariate - Full Sample



- Downgrades of “S” and “L” ratings do not vary across interest rate risk (IRR) bins prior to 2022:q2 but increase monotonically across IRR bins after 2022:q2

Interest Rate Risk: Regression Framework

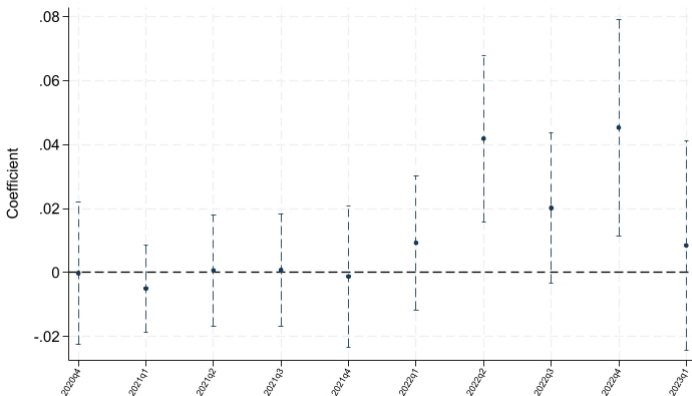
$$\text{Downgrade}_{it} = \alpha_i + \gamma_t + \beta_0 \text{Int. Rate Risk}_{it} + \beta_1 \text{Int. Rate Risk}_{it} \times \text{Post}_t + \Gamma X_{it} + \epsilon_{it}$$

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		I(L-Downgrade)=1				I(S-Downgrade)=1		
Share of LT Sec	-0.003 (0.002)	-0.009 (0.018)			0.001 (0.004)	0.015 (0.013)		
Share of LT Sec \times Post	0.022*** (0.008)	0.016 (0.013)			0.028*** (0.010)	0.018 (0.014)		
Duration			-0.001* (0.000)	0.000 (0.003)			-0.000 (0.001)	0.004 (0.003)
Duration \times Post			0.006*** (0.001)	0.004** (0.002)			0.006*** (0.002)	0.004 (0.002)
Observations	7102	5620	7102	5620	7102	5620	7102	5620
Adjusted R^2	0.087	0.074	0.090	0.075	0.022	-0.006	0.024	-0.006
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes

- Banks exposed to more IRR more likely to be downgraded after the FED started tightening in 2022:q2
 - Likelihood of downgrade \uparrow 9 p.p. when a bank goes from having no LT securities to entire portfolio in LT securities
 - An additional year of duration \uparrow probability of downgrade by 0.6%

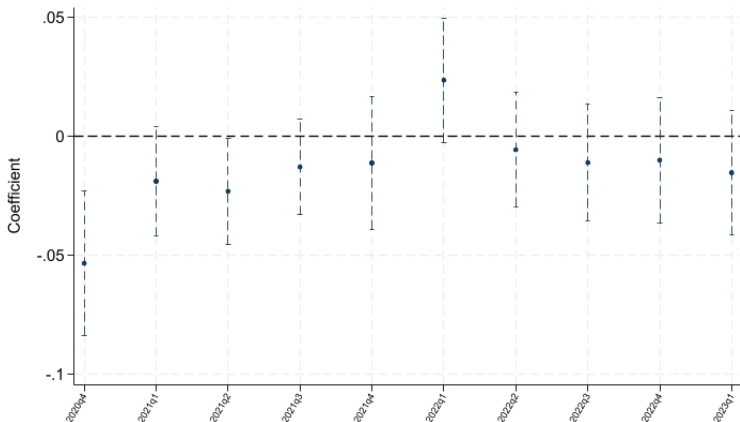
Interest Rate Risk: Multivariate - Timing

$$\text{Downgrade}_{it} = \alpha_i + \gamma_t + \beta_t \text{Int. Rate Risk}_{it} \times \gamma_t + \Gamma_t X_{it} + \epsilon_{it}$$



- Supervisory sensitivity to IRR kicks in with the monetary tightening but lagging markets expectations of interest rates hikes

Interest Rate Risk proxying for financial health?



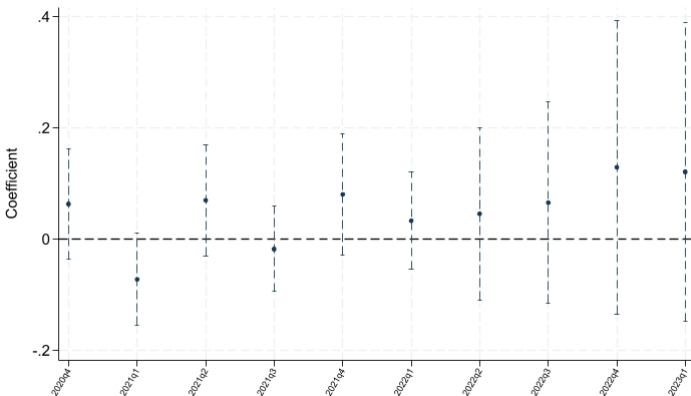
- Other subcomponents of CAMELS rating not sensitive to IRR measures

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Unstable Sources of Funding: Multivariate - Timing

Did supervisors downgrade banks with greater exposure to unstable sources of funding?



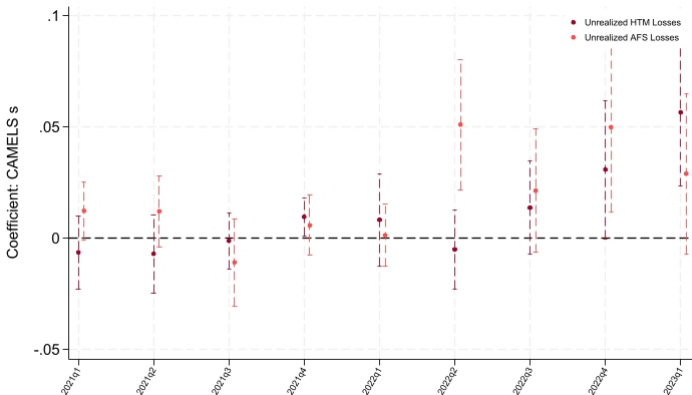
- CAMELS do not incorporate information about instability of the sources of funding

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Bank Supervision and HTM Accounting

Were supervisors less sensitive to unrealized losses in HTM?



- ↑ downgrades associated with AFS unrealized losses starting in 2022:q2 but only associated with HTM unrealized losses after SVB

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Taking Stock

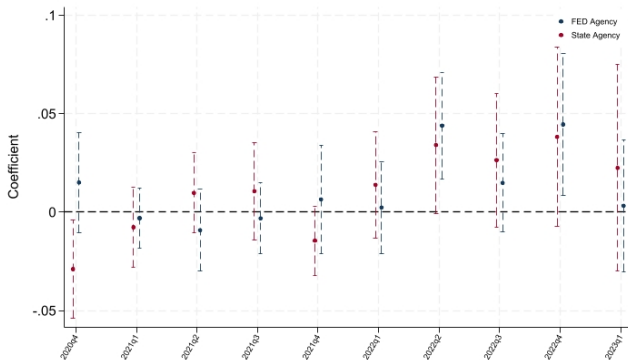
- 1 Supervisors downgraded banks most exposed to interest rate risks but only after the second quarter of 2022
- 2 Supervisors were not more likely to downgrade banks with greater reliance on unstable sources of funding
- 3 Supervisors were faster to downgrade banks with exposures to AFS unrealized losses than they were to downgrade banks with HTM losses

Two questions:

- What factors might explain this pattern? Sophistication? Supervisory Resources? Forbearance?
- Did downgrades of “S” and “L” components curb interest rate risks?

Heterogeneity in Supervisory Downgrades

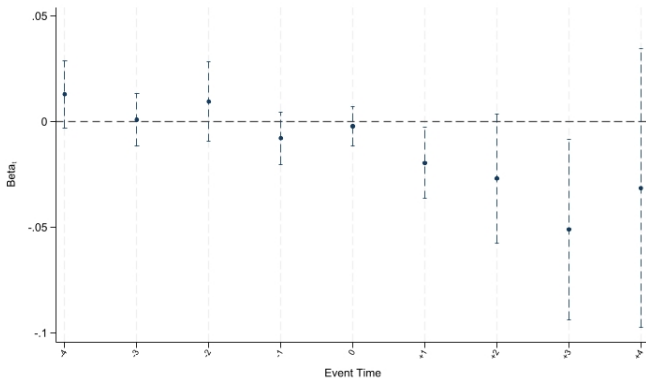
- Agarwal et al (2014), Costello, Granja, and Weber (2019), and Granja and Leuz (2024) show that federal agencies are stricter



- Rules out interagency differences in sophistication, resources, and forbearance as factors determining downgrading decisions

Supervisory Downgrades and Portfolio Allocation - I

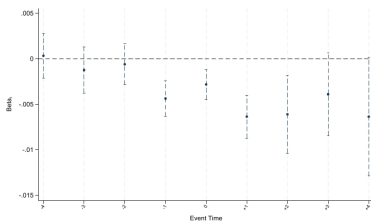
$$\%LTSec_{it} = \alpha_i + \gamma_t + \sum_{t=-4}^{t=4} (\beta_t Downgrade_i \times \gamma_t) + \Gamma X_{it} + \epsilon_{it} \quad (1)$$



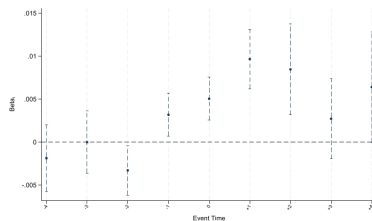
- Consistent with reduction in IRR after a downgrade

Supervisory Downgrades and Portfolio Allocation - II

Panel D. Total Securities (% Assets)



Panel E. Total Cash (% Assets)



- Some reallocation from securities to cash
- **Caveats:** (1) Anticipation effects?; (2) Short panel

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Policy Discussion

If regulators understood interest rate risks, why were they unable to prevent the regional banking crisis of 2023?

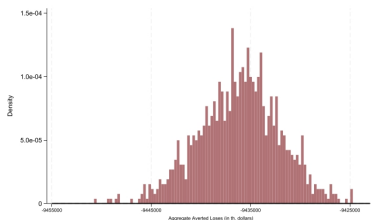
- 1** Supervisors lacked the authority to force banks to operate a meaningful reallocation
 - Banks, on average, reallocate securities to cash in the amount of 0.5% of their total assets following a downgrade but held approximately 27% of their assets in AFS and HTM securities
- 2** Better coordination between monetary policy and supervision might have allowed for earlier intervention
 - Back of the Envelope computation

Back of the Envelope

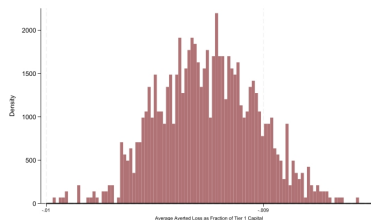
What if the supervisors had started downgrading using the post-2022:q2 model two quarters earlier than they did?

■ Assuming:

- Similar portfolio reallocation after a downgrade
- No effects on the trajectories of security prices (banks are price-takers)
- Composition of reallocated securities similar to that of the portfolio



(a) Aggregate Averted Losses



(b) % Tier 1

- Average averted losses of \approx \$9 billion or 1% of Tier 1 capital of counterfactually downgraded banks

Conclusion

- Three facts about supervisory actions during the 2022 monetary tightening:
 - 1 Supervisors incrementally downgraded banks most exposed to interest rate risks but only after tightening had begun
 - 2 Supervisors did **not** incrementally downgrade banks that relied heavily on unstable sources of funding
 - 3 Supervisors incrementally downgraded banks with large unrealized losses in AFS after tightening had begun but only downgraded banks with unrealized losses in HTM after SVB collapsed
- **Policy:** Findings suggest that better policy coordination between monetary and supervisory functions would be of limited effect if not accompanied by a bigger stick to prompt reallocation
- **Open Questions:**
 - 1 What factors might explain variation in supervisory decisions?
 - 2 How does this cycle compare with prior monetary tightening cycles?

Descriptive Statistics: Selection to Exams based on Observables?

Predetermined exam rotation \implies Exam selection likely \perp to observables

	Pre-Tightening Exams			Post-Tightening Exams			Diff	t-stat
	Mean	St. Dev.	N	Mean	St. Dev.	N		
Duration	10.26	5.340	4445	9.760	5.360	2657	-0.500	-1.540
Share of LT Sec	0.220	0.230	4445	0.210	0.230	2657	-0.0100	-0.610
Hedging Intensity	0.0200	0.0500	4576	0.0100	0.0500	2701	0	-2.580
Share Uninsured	0.400	0.160	4576	0.430	0.150	2701	0.0300	4.030
Dep. Beta	0.320	0.0900	4576	0.320	0.0900	2701	0	-0.0900
Ln(Assets)	12.77	1.580	4576	12.88	1.570	2701	0.100	1.640
Loans as % Total Assets	59.06	16	4576	57.90	16.97	2701	-1.160	-0.850
ROA	0.0200	0.0200	4576	0.0100	0.0200	2701	-0.0100	-0.500
LLR as % Total Assets	0.850	0.400	4576	0.810	0.380	2701	-0.0400	-4.010
NPL as % Total Assets	0.440	0.650	4576	0.310	0.540	2701	-0.120	-4.850
Equity as % Total Assets	10.98	3.200	4576	9.250	3.730	2701	-1.730	-8.690

- Some statistical differences in terms of reliance on uninsured deposits and capitalization but not in terms of exposure to interest rate risk