Monetary Transmission through Bank Securities Portfolios

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Motivation

- 2020/21: SVB invested in long-term securities booked as Held-to-Maturity (HTM)
- March 2023: uninsured depositors withdrew their funds as they worried that they would not be repaid in full when SVB liquidated its security portfolio at market prices
- **Recent Chicago Booth Survey**: "For the purposes of capital regulation, banks should be required to mark their holdings of Treasury and Agency securities to market at all times (even though their loans are not marked to market)."

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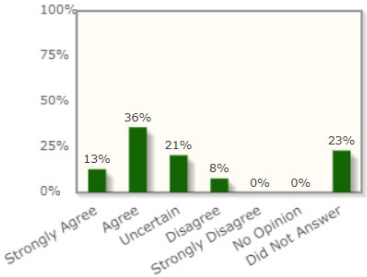

Motivation ▸ Literature

- **Darrell Duffie (Stanford), Agree**: "Frequent marking to market for purposes of maintaining adequate capital buffers would lead to fewer sudden realizations of capital shortfalls and fewer catastrophic failures ..." → Fewer bank runs & more prudent behavior
- **Campbell Harvey (Duke), Disagree**: "... It is unfair to mark to market the HTM & not the liabilities ..." → Additional pressure on bank balance sheets
- **Question**: How does marking securities to market in regulatory capital influence monetary transmission from policy rates into bank lending?
- **Approach**: Analyze supervisory micro data on securities, hedges, and corporate credit & interpret findings with structural general equilibrium model
- **Findings**: (i) Empirics: security value changes impact bank-firm lending if they pass through to regulatory capital (ii) Model: stronger monetary transmission under such regulation

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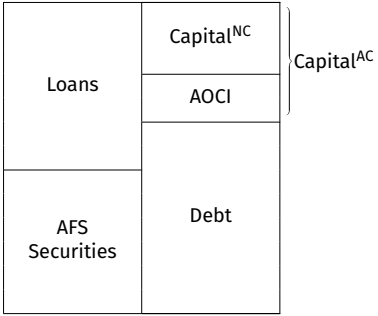
Institutional Setting

Primer on Accounting: Available-for-Sale Securities

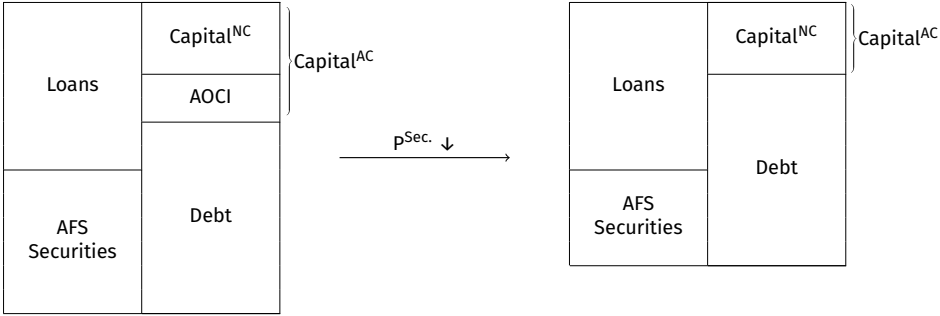
Hedged AFS HTM



- **AOCI** ("accumulated other comprehensive income") $\approx$ AFS unrealized gains and losses
- **AC banks** = AOCI-Capital banks; **NC banks** = Non-AOCI-Capital banks ("AOCI Filter")

Primer on Accounting: Available-for-Sale Securities

Hedged AFS | HTM



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- **Channels for** $P^{Sec} \downarrow \Rightarrow$ **Loans** $\downarrow$: (i) regulatory capital, (ii) planned income, (iii) collateral
- **Hedged AFS & HTM**: collateral channel still present, but overall weaker spillover effect

Data

Data

- **Y-14Q data** for large U.S. banks subject to the Federal Reserve's stress tests
  - Highly detailed data with key features unavailable in typical data sets
- We combine quarterly data from three schedules:
  1. B.1: Security level panel without size cutoff (investment portfolio)
  2. B.2: Designated accounting hedges matched to securities
  3. H.1: Corporate loan panel on universe of loan facilities >$1M
- Augment with Y-9C data for BHCs & Compustat data for public firms
- **2021:Q1-2023:Q1**: focus on monetary tightening cycle & same length pre-sample
- Over this period, around **30 banks** in the sample, **1/3 are AC banks**

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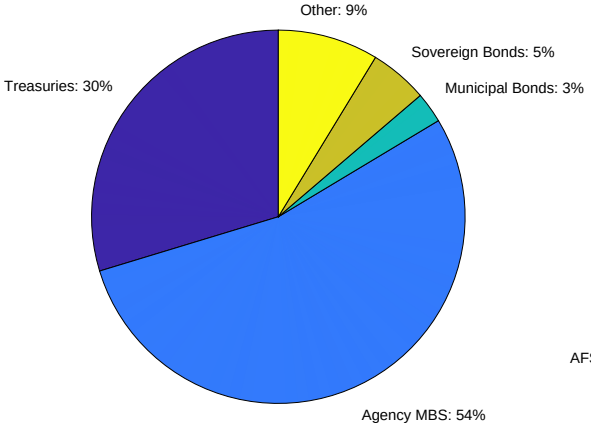
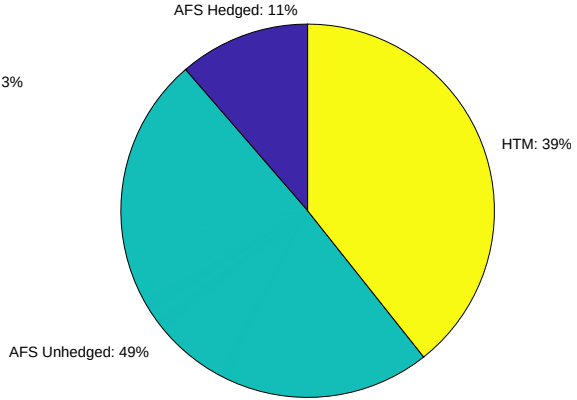
Stylized Facts

Security Composition

AC Banks | NC Banks | Hedging Composition

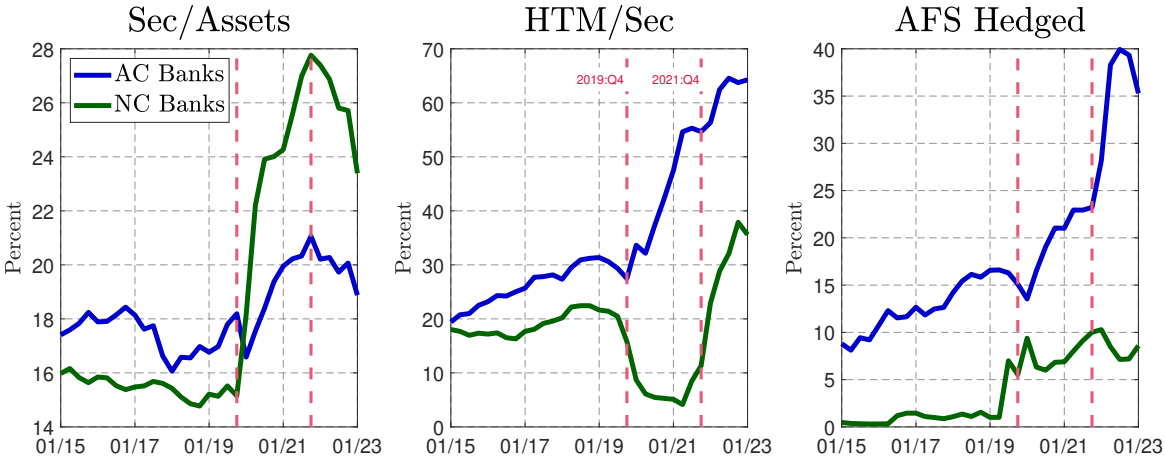




Shares based on market values in 2021:Q4.

AC vs. NC Banks

▸ Reclassification ▸ Effective Duration ▸ AOCI



Vertical lines indicate 2019:Q4 and 2021:Q4.

Identifying Credit Supply Effects

Identifying Credit Supply Effects

- **When bank securities lose value, do lenders cut credit to firms?**
- Following Khwaja and Mian (2008), estimate regression for firm i and bank j:

$$\frac{L_{i,j,t+2} - L_{i,j,t}}{0.5 \cdot (L_{i,j,t+2} + L_{i,j,t})} = \alpha_{i,t} + \beta \cdot \frac{\Delta Value^{AFS}_{j,t}}{Assets_{j,t}} + \gamma X_{j,t} + \kappa_j + \tau_{AC_j,t} + u_{i,j,t}$$

- $\Delta Value^{AFS}_{j,t} = \sum^k \Delta P^k_t \cdot Q^k_{j,t}$ is the sum of all value changes of AFS securities at bank j
- Fixed effects: firm-time FE $\alpha_{i,t}$, bank FE κ_j, AC-banks-time FE $\tau_{AC_j,t}$
- Sample restricted to term loans only & 2021:Q1-2023:Q1 episode

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Security Valuation & Firm Credit Supply

- Banks with larger losses on AFS securities extend less credit: around 20 cents per $

	(i)	(ii)	(iii)	(iv)
Δ Value AFS	6.08***	7.31***	6.15***	7.37***
	(1.85)	(1.91)	(1.78)	(1.88)
Δ Value HTM			1.93	1.31
			(1.47)	(1.23)
Fixed Effects				
Firm × Time	✓		✓	
Firm × Time × Purpose		✓		✓
Bank & AA × Time	✓	✓	✓	✓
Bank Controls	✓	✓	✓	✓
R-squared	0.57	0.55	0.57	0.55
Observations	13,038	11,093	13,038	11,093
Number of Firms	1,289	1,105	1,289	1,105
Number of Banks	27	26	27	26

Bank controls: ROA, dep/assets, income gap, ln(assets), unused credit/assets, liab./assets, loans/assets. Standard errors clustered by bank. Sample: 2021:Q1-2023:Q1.

Security Valuation & Firm Credit Supply

- ... but such spillover effects do not exist for valuation changes of HTM securities

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Exploring the Mechanism

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- To investigate channels, consider ...
- ... (i) differentiate between hedged and unhedged securities

$$\frac{L_{i,j,t+2} - L_{i,j,t}}{0.5 \cdot (L_{i,j,t+2} + L_{i,j,t})} = \beta_1 \cdot \frac{\Delta Value_{j,t}^{AFS,unhedged}}{Assets_{j,t}} + \beta_2 \cdot \frac{\Delta Value_{j,t}^{AFS,hedged}}{Assets_{j,t}} + \ldots + u_{i,j,t}$$

- ... (ii) interaction with AC-banks indicator

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Hedged & Unhedged Securities

- Results seem to be driven by AFS securities that are not hedged to interest rate risk

	(i)	(ii)	(iii)	(iv)
Δ Value AFS Unhedged	7.08**	8.09***	7.35**	8.35***
	(2.93)	(2.71)	(2.81)	(2.70)
Δ Value AFS Hedged			4.75	4.16
			(5.58)	(5.33)
Fixed Effects				
Firm × Time	✓		✓	
Firm × Time × Purpose		✓		✓
Bank & AC × Time	✓	✓	✓	✓
Bank Controls	✓	✓	✓	✓
Derivatives	✓	✓	✓	✓
R-squared	0.57	0.55	0.57	0.55
Observations	13,027	11,093	13,027	11,093
Number of Firms	1,288	1,105	1,288	1,105
Number of Banks	26	26	26	26

Bank controls: ROA, dep/assets, income gap, ln(assets), unused credit/assets, liab./assets, loans/assets. Standard errors clustered by bank. Sample: 2021:Q1-2023:Q1.

AC versus NC Banks

- Effects are more pronounced for AOCI-Capital (AC) banks

	(i)	(ii)	(iii)	(iv)
Δ Value AFS	4.83**	5.65**	-2.08	-2.53
	(2.14)	(2.37)	(4.81)	(4.92)
Δ Value AFS $\times$ AC	7.55**	9.26***	12.95*	15.18**
	(3.50)	(3.14)	(6.94)	(6.39)
Fixed Effects				
Firm $\times$ Time	✓		✓	
Firm $\times$ Time $\times$ Purpose		✓		✓
Bank	✓	✓	✓	✓
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Bank Controls $\times$ Δ Value AFS			✓	✓
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Further Evidence

- **Regression Specifications** ▸ More
  - (i) extensive margin (ii) dynamic response (iii) interest rates (iv) pre-trend (v) FE extensions
- **Alternative Samples** ▸ More
  - (i) extended sample (ii) asymmetric effects (iii) credit lines (iv) omitting 2023:Q1 & firm-time FE
- **Evidence on Channels** ▸ More
  - (i) bank capital positions (ii) MP innovations (iii) cash-flow and deposit channels

Effects at the Firm Level

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- **Do these effects persist at the firm level, affecting total debt and investment?**
- Estimate regression for firm i at annual frequency:

$$\frac{y_{i,t+4} - y_{i,t}}{0.5 \cdot (y_{i,t+4} + y_{i,t})} = \alpha_i + \kappa_t + \beta \cdot \widetilde{\Delta Value}^{AFS}_{i,t} + \gamma X_{i,t} + u_{i,t}$$

- Firm outcomes: y is either total debt, fixed assets ("investment"), or cash
- Weighted value changes: $\widetilde{\Delta Value}^{AFS}_{i,t} = \sum^{j} (\Delta Value^{AFS}_{j,t} / Assets_{j,t}) \cdot (L_{i,j,t} / Debt_{i,t})$
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Effects at the Firm level

CL Space

- AFS value changes translate into changes of firm outcomes, but only for small firms

	Δ Total Debt		Investment		Δ Cash	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Δ Value AFS	6.17**		5.31**		10.46**	
	(3.09)		(2.67)		(4.48)	
Δ Value AFS × Small		6.27**		5.36**		10.48**
		(3.10)		(2.67)		(4.49)
Δ Value AFS × Large		-11.37		-4.32		7.65
		(13.12)		(9.31)		(18.39)
Fixed Effects						
Firm	✓	✓	✓	✓	✓	✓
Time	✓	✓	✓	✓	✓	✓
Firm Controls	✓	✓	✓	✓	✓	✓
R-squared	0.73	0.73	0.72	0.72	0.66	0.66
Observations	69,934	69,934	82,472	82,472	81,900	81,900
Number of Firms	19,046	19,046	22,162	22,162	22,116	22,116
Number of Banks	29	29	30	30	30	30

Firm controls: cash, net income, fixed assets, liabilities, ln(assets), unused credit/debt, observed credit/debt, sales, weighted bank controls. Standard errors clustered by firm. Sample: 2021:Q1-2023:Q1.

Structural Model

Model Overview

- DSGE model featuring households, firms, banks, government
  - Smaller "constrained" firms only have access bank term loans → market spread
  - Larger "unconstrained" firms have access to credit lines & corporate bonds → fixed spreads
- Bank provides credit lines and term loans to firms, maximizing

$$v_t = \underbrace{d_t}_{\text{dividends}} - \underbrace{\left(\frac{\eta_k}{\bar{k}^{\zeta_L}}\right)\frac{k_t^{1+\zeta_L}}{1+\zeta_L}}_{\text{capital holding costs}} + E_t\left[\Lambda_{S,t+1} v_{t+1}\right]$$

$$\text{s.t.} \quad k_t + \underbrace{(P_t - \bar{P}) \times b^{LT}}_{AOCI_t} \geq \underbrace{\chi^B (B^{loan}_{C,t} + B^{loan}_{U,t})}_{\text{risk-weighted used credit}} + \underbrace{\chi^L (\bar{L} - B^{loan}_{U,t})}_{\text{risk-weighted undrawn lines}}$$

- Experiment: Shocks to inflation, real rate & investment demand to mimic 2022-episode → calibrate ζ_L to match regression evidence on debt response of smaller firms

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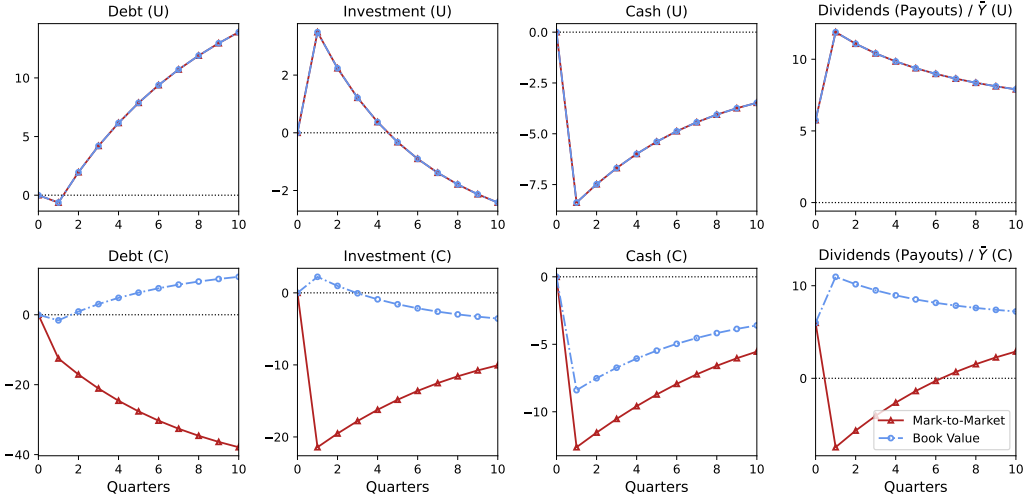
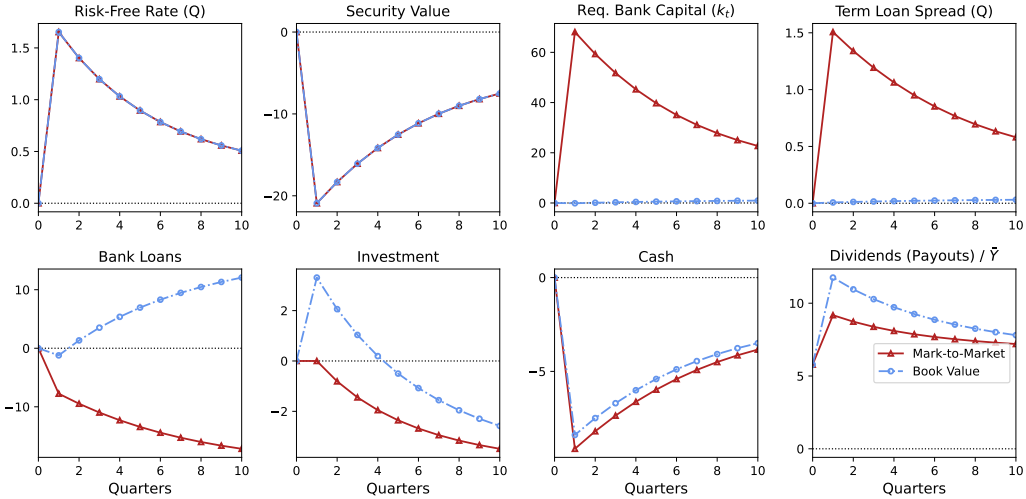
Responses by Type



Aggregate Responses



Conclusion

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- Key take-away: Monetary transmission through bank security portfolios depends on regulatory framework of the banking system
- Detailed micro data on bank securities, hedges, and lending shows:
  - Value changes of securities lead to adjustments of banks' credit supply
  - Especially for banks that must adapt regulatory capital for value fluctuations of securities
  - Credit supply changes pass through to total debt & investment of small firms
- Structural model: Policy rate transmission is more powerful—both in speed and in magnitude—if all banks must adjust regulatory capital for security value changes

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Policy Debate

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- **Questions**: (1) Should banks always mark their long-term securities to market?
  (2) Should unrealized value changes of securities pass through to regulatory capital?
- **Financial Stability** ("Duffie Argument"): Fewer sudden realizations of capital shortfalls $\rightarrow$ "market-based macroprudential regulation"
- **Monetary Transmission** (this paper): more powerful tool $\rightarrow$ possibly desirable for CBs

1. Concern: Fair-value accounting may exacerbate downturns
   $\rightarrow$ not the case for interest rate-sensitive securities
2. Concern: Volatility in securities markets passes through to real economy
   $\rightarrow$ but banks may also raise more equity + generally act more prudent
3. Concern: Liabilities are not marked to market
   $\rightarrow$ reason for documented spillover effect
4. Concern: Lower demand for securities, raises costs for government & HHs
   $\rightarrow$ costs to pay so that banks account for interest rate risk

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- **Monetary Transmission** (this paper): more powerful tool $\rightarrow$ possibly desirable for CBs

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   $\rightarrow$ not the case for interest rate-sensitive securities
2. Concern: Volatility in securities markets passes through to real economy
   $\rightarrow$ but banks may also raise more equity + generally act more prudent
3. Concern: Liabilities are not marked to market
   $\rightarrow$ reason for documented spillover effect
4. Concern: Lower demand for securities, raises costs for government & HHs
   $\rightarrow$ costs to pay so that banks account for interest rate risk

Policy Debate

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APPENDIX

Literature Review

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- **Bank Lending Channel of Monetary Policy:** Bernanke Gertler (1995), Kashyap Stein (2000), Jimenez et al. (2012), Drechsler Savov Schnabl (2017), Gomez et al. (2021).
- **Here:** More liquid securities → more responsive to MP changes.
- **Credit Supply Effect from Bank Security Exposures:** Popov van Horen (2015), Rodnyansky Darmouni (2017), Acharya et al. (2018), De Marco (2019), Bottero Lenzu Mezzanotti (2020), Chakraborty Goldstein MacKinlay (2020) Luck Zimmermann (2020), Orame Ramcharan Robatto (2023).
- **Here:** U.S. micro data on securities and hedges, regulatory rules for identification, macroeconomic framework, let us study systemic implications.
- **Banks' Exposure to Interest Rate Risk & Derivative Contracts:** Purnanandam (2007), Begenau Piazzesi Schneider (2015), Hoffmann et al. (2019), Drechsler Savov Schnabl (2021), Paul (2023), Jiang et al. (2023), McPhail Schnabl Tuckman (2023).
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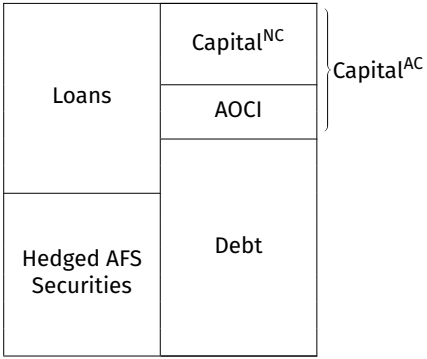
Primer on Accounting: Hedging

Back



- **Data**: Most hedges are interest rate swaps (fair-value hedges against interest rate risk)

Primer on Accounting: Hedging

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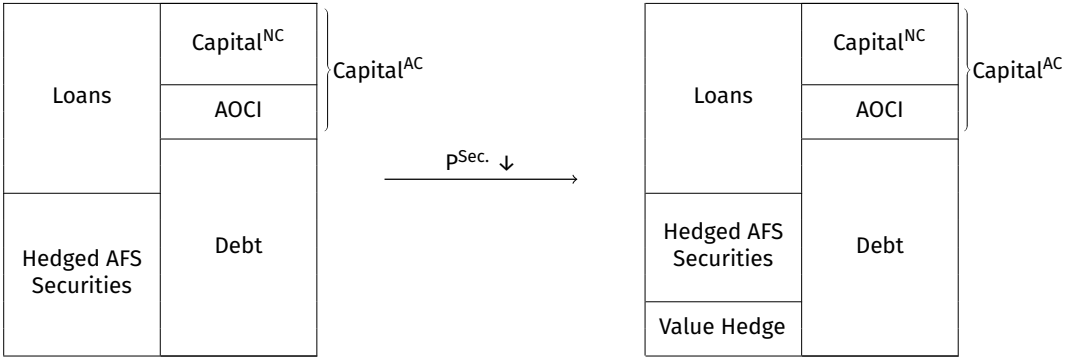
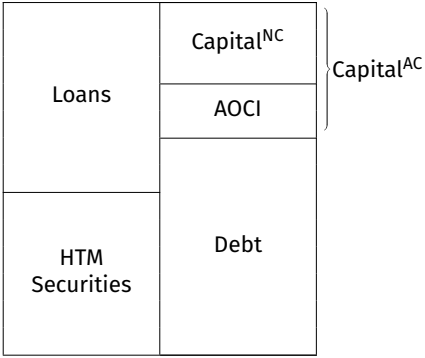


- **Data**: Most hedges are interest rate swaps (fair-value hedges against interest rate risk)
- Spillover effect: collateral channel may still be present since hedges are less pledgeable

Primer on Accounting: Held-to-Maturity Securities

Back



Primer on Accounting: Held-to-Maturity Securities

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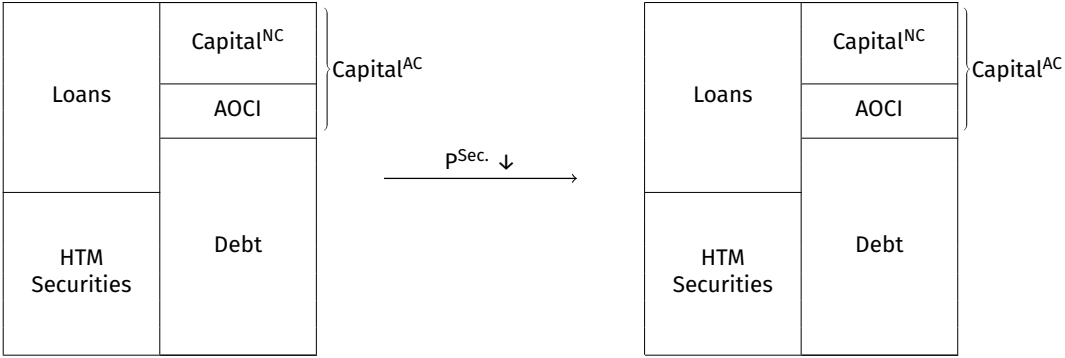
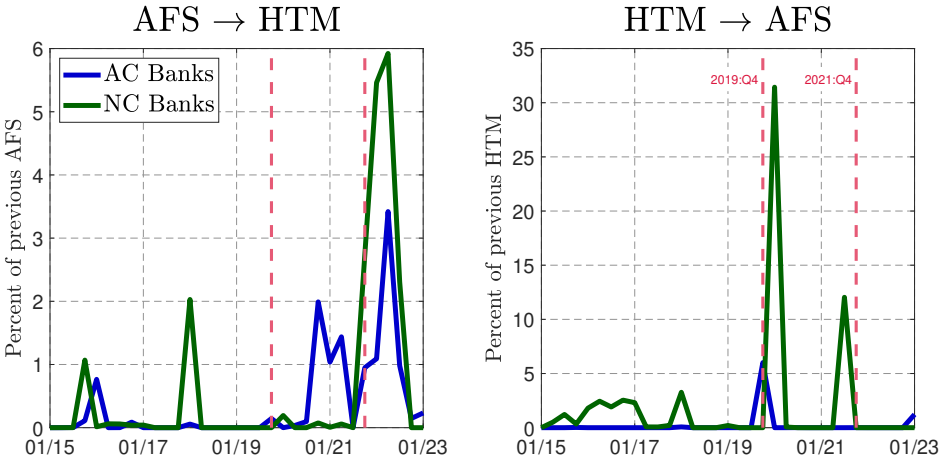


- Spillover effect: collateral channel may still be present since value of securities matters

Reclassification of Securities

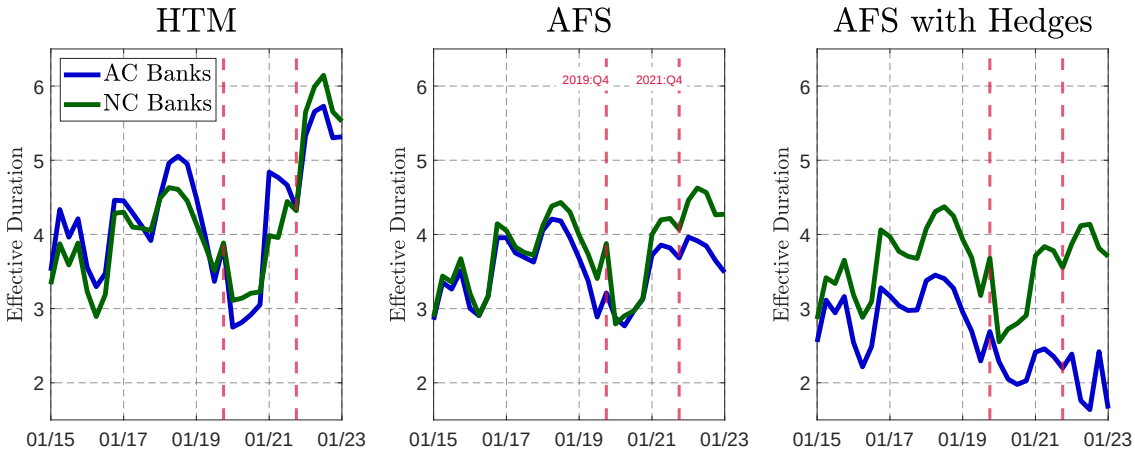
Back



Vertical lines indicate 2019:Q4 and 2021:Q4.

Duration

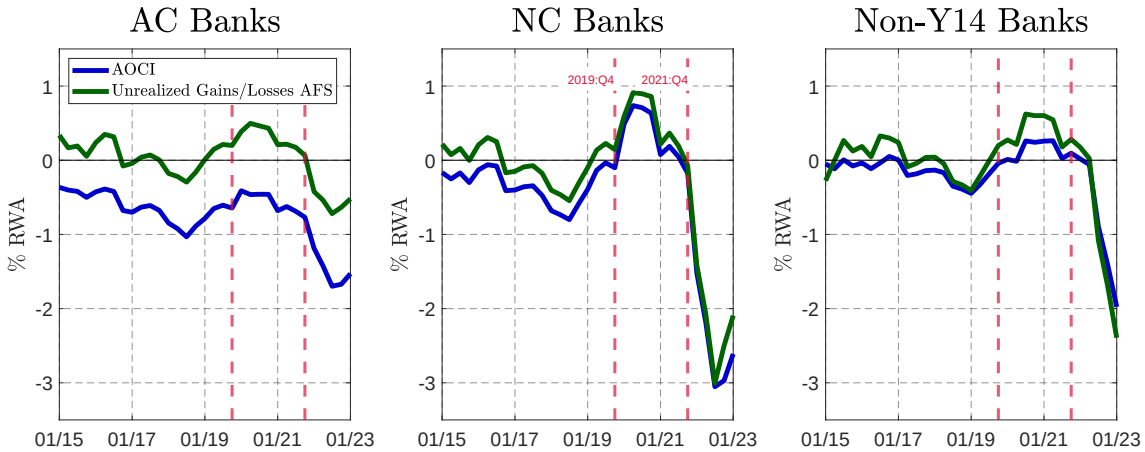
Back



Vertical lines indicate 2019:Q4 and 2021:Q4.

AOCI & Unrealized Gains/Losses AFS

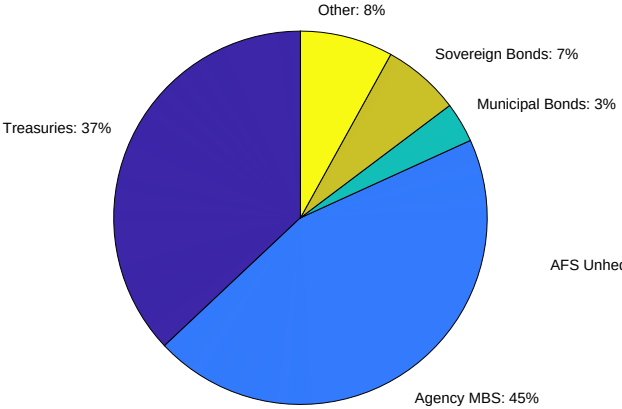
Back

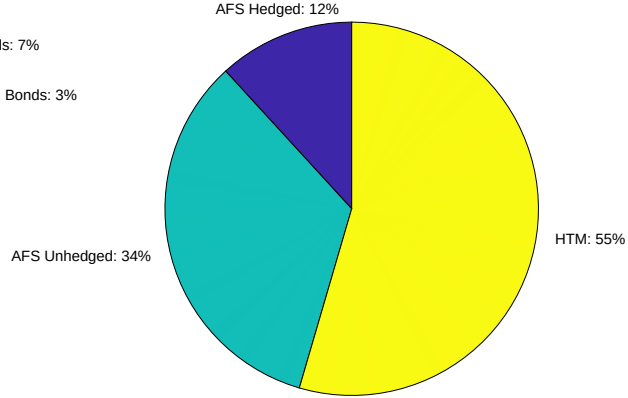


Vertical lines indicate 2019:Q4 and 2021:Q4.

Security Composition: AC Banks

Back

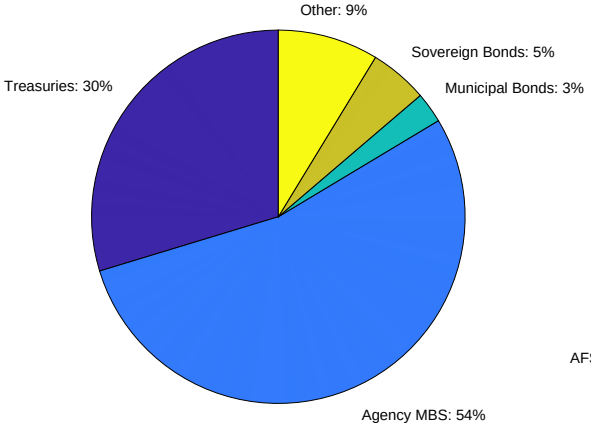


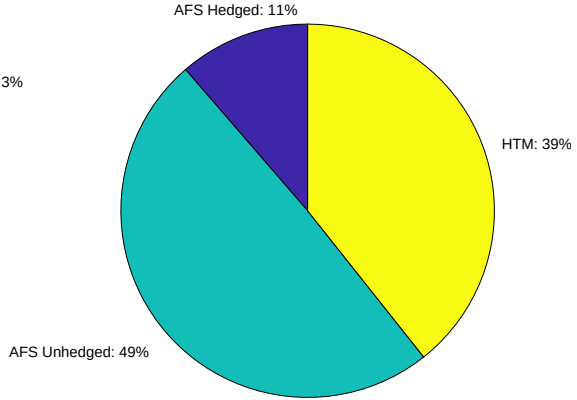


Shares based on market values in 2021:Q4.

Security Composition: NC Banks

Back

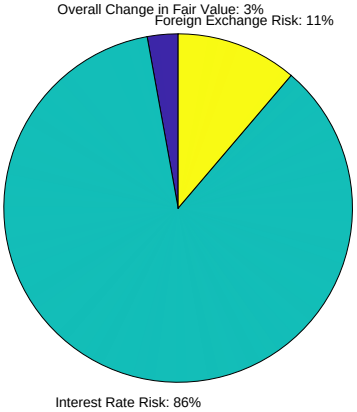


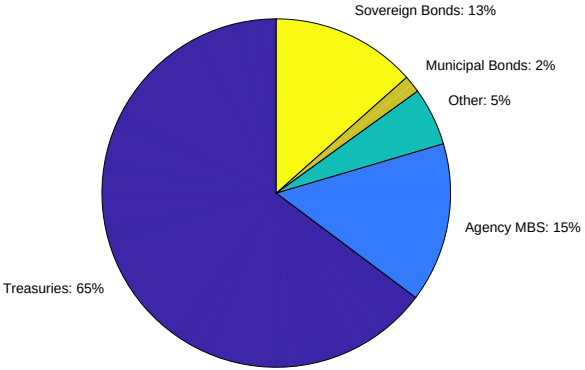


Shares based on market values in 2021:Q4.

Hedging Composition

AC Banks | NC Banks | Back





Shares based on market values in 2021:Q4.

Hedging Composition: AC Banks

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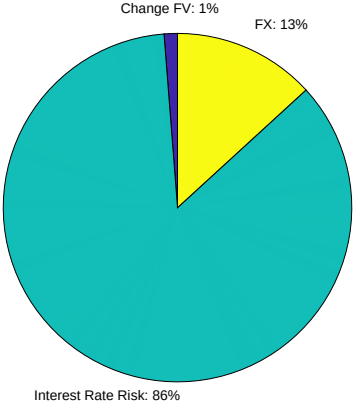

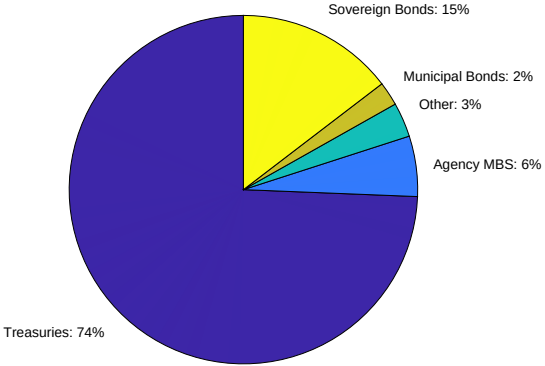

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Hedging Composition: NC Banks

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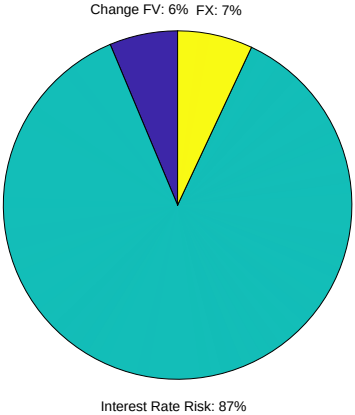

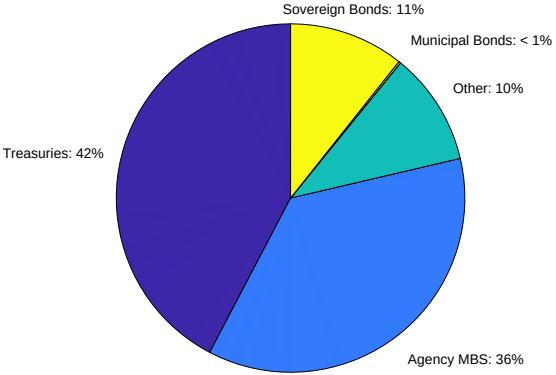

Shares based on market values in 2021:Q4.

Extensive Margin

Back

- Results intensify when considering extensive margin

	(i)	(ii)	(iii)	(iv)
Δ Value AFS	48.38***	43.47***	47.48***	43.70***
	(14.23)	(11.57)	(13.48)	(11.26)
Δ Value HTM			-7.61	1.89
			(11.82)	(9.14)
Fixed Effects				
Firm × Time	✓		✓	
Firm × Time × Purpose		✓		✓
Bank & AC × Time	✓	✓	✓	✓
Bank Controls	✓	✓	✓	✓
R-squared	0.69	0.71	0.69	0.71
Observations	23,200	19,744	23,200	19,744
Number of Firms	2,781	2,385	2,781	2,385
Number of Banks	30	28	30	28

Bank controls: ROA, dep/assets, income gap, ln(assets), unused credit/assets, liab./assets, loans/assets. Standard errors clustered by bank. Sample: 2021:Q1-2023:Q1.

Dynamic response

Back

- Effects already present within the same quarter
- Strongest at three-quarter horizon

	h=1	h=2	h=3	h=4	h=5
Δ Value AFS	6.82**	11.80***	12.56***	9.91*	6.03
	(3.18)	(3.80)	(4.11)	(5.17)	(4.04)
Fixed Effects					
Firm × Time	✓	✓	✓	✓	✓
Bank & AC × Time	✓	✓	✓	✓	✓
Bank Controls	✓	✓	✓	✓	✓
R-squared	0.59	0.57	0.57	0.57	0.58
Observations	5,087	5,087	5,087	5,087	5,087
Number of Firms	771	771	771	771	771
Number of Banks	27	27	27	27	27

Bank controls: ROA, dep/assets, income gap, ln(assets), unused credit/assets, liab./assets, loans/assets. Standard errors clustered by bank. Sample: 2021:Q1-2023:Q1.

Interest Rates

Back

- Effects are weaker for interest rates
- Possibly explained by balance sheet space

	h=1	h=2	h=3	h=4	h=5
Δ Value AFS	-0.02	-0.09	-0.16**	-0.13	-0.10
	(0.03)	(0.05)	(0.06)	(0.11)	(0.13)
Fixed Effects					
Firm $\times$ Time	✓	✓	✓	✓	✓
Bank & AC $\times$ Time	✓	✓	✓	✓	✓
Bank Controls	✓	✓	✓	✓	✓
R-squared	0.6	0.81	0.89	0.91	0.92
Observations	5,017	5,017	5,017	5,017	5,017
Number of Firms	765	765	765	765	765
Number of Banks	27	27	27	27	27

Bank controls: ROA, dep/assets, income gap, ln(assets), unused credit/assets, liab./assets, loans/assets. Standard errors clustered by bank. Sample: 2021:Q1-2023:Q1.

Placebo Regression

Back

- Results not present for dependent variable from $t-2$ to t

	(i)	(ii)	(iii)	(iv)
Δ Value AFS	-0.32	-0.07	-0.26	-0.06
	(1.98)	(1.84)	(1.97)	(1.84)
Δ Value HTM			0.44	0.08
			(0.57)	(0.72)
Fixed Effects				
Firm $\times$ Time	✓		✓	
Firm $\times$ Time $\times$ Purpose		✓		✓
Bank & AC $\times$ Time	✓	✓	✓	✓
Bank Controls	✓	✓	✓	✓
R-squared	0.58	0.56	0.58	0.56
Observations	16,570	14,082	16,570	14,082
Number of Firms	1,423	1,215	1,423	1,215
Number of Banks	29	28	29	28

Bank controls: ROA, dep/assets, income gap, ln(assets), unused credit/assets, liab./assets, loans/assets. Standard errors clustered by bank. Sample: 2021:Q1-2023:Q1.

Credit Supply: Firm-Time FE Extensions

Back

- Extending firm-time FE by loan characteristics does not affect results

	(i)	(ii)	(iii)	(iv)	(v)
Δ Value AFS	6.08***	5.65***	5.49***	5.33***	5.63**
	(1.85)	(1.94)	(1.56)	(1.65)	(2.08)
Fixed Effects					
Firm × Time	✓				
Firm × Time × Syn.		✓			
Firm × Time × Mat.			✓		
Firm × Time × Float.				✓	
Firm × Time × All					✓
Bank & AA × Time	✓	✓	✓	✓	✓
Bank Controls	✓	✓	✓	✓	✓
R-squared	0.57	0.53	0.54	0.54	0.53
Observations	13,038	11,606	12,523	11,376	10,277
Number of Firms	1,289	1,165	1,242	1,142	1,035
Number of Banks	27	27	27	27	25

Bank controls: ROA, dep/assets, income gap, ln(assets), unused credit/assets, liab./assets, loans/assets. Standard errors clustered by bank. Sample: 2021:Q1-2023:Q1.

Extended Sample

Back

- Results are weaker but hold for an extended sample

	(i)	(ii)	(iii)	(iv)
Δ Value AFS	3.17**	4.87***	3.23**	4.91***
	(1.49)	(1.77)	(1.53)	(1.79)
Δ Value HTM			1.24	0.60
			(0.94)	(0.91)
Fixed Effects				
Firm × Time	✓		✓	
Firm × Time × Purpose		✓		✓
Bank & AA × Time	✓	✓	✓	✓
Bank Controls	✓	✓	✓	✓
R-squared	0.56	0.55	0.56	0.55
Observations	41,541	33,269	41,541	33,269
Number of Firms	2,301	1,896	2,301	1,896
Number of Banks	34	34	34	34

Bank controls: ROA, dep/assets, income gap, ln(assets), unused credit/assets, liab./assets, loans/assets. Standard errors clustered by bank. Sample: 2016:Q4-2023:Q1.

Asymmetric Effects

Back

- Results are stronger for negative AFS value changes

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Δ Value AFS (-)	3.38**	5.62***			3.24**	5.50***
	(1.49)	(1.63)			(1.48)	(1.60)
Δ Value AFS (+)			3.66	3.77	3.07	2.80
			(4.06)	(5.18)	(4.00)	(5.04)
Fixed Effects						
Firm × Time	✓		✓		✓	
Firm × Time × Purpose		✓		✓		✓
Bank & AC × Time	✓	✓	✓	✓	✓	✓
Bank Controls	✓	✓	✓	✓	✓	✓
R-squared	0.56	0.55	0.56	0.55	0.56	0.55
Observations	41,561	33,290	41,561	33,290	41,561	33,290
Number of Firms	2,303	1,897	2,303	1,897	2,303	1,897
Number of Banks	35	35	35	35	35	35

Bank controls: ROA, dep/assets, income gap, ln(assets), unused credit/assets, liab./assets, loans/assets. Standard errors clustered by bank. Sample: 2016:Q4-2023:Q1.

Credit Lines

Back

- Results remain when including credit lines into sample

	(i)	(ii)	(iii)	(iv)
Δ Value AFS	6.68***	7.63***	6.68***	7.63***
	(1.97)	(2.30)	(1.98)	(2.29)
Δ Value HTM			0.36	0.29
			(0.95)	(1.00)
Fixed Effects				
Firm × Time	✓		✓	
Firm × Time × Purpose		✓		✓
Bank & AC × Time	✓	✓	✓	✓
Bank Controls	✓	✓	✓	✓
R-squared	0.62	0.62	0.62	0.62
Observations	35,884	29,988	35,884	29,988
Number of Firms	2,718	2,359	2,718	2,359
Number of Banks	28	28	28	28

Bank controls: ROA, dep/assets, income gap, ln(assets), unused credit/assets, liab./assets, loans/assets. Standard errors clustered by bank. Sample: 2021:Q1-2023:Q1.

Excluding 2023:Q1

Back

- Results remain when excluding period of financial turmoil in 2023:Q1

	(i)	(ii)	(iii)	(iv)
Δ Value AFS	8.16***	9.95***	8.45***	10.26***
	(2.70)	(2.66)	(2.40)	(2.43)
Δ Value HTM			3.21*	2.52*
			(1.58)	(1.36)
Fixed Effects				
Firm × Time	✓		✓	
Firm × Time × Purpose		✓		✓
Bank & AC × Time	✓	✓	✓	✓
Bank Controls	✓	✓	✓	✓
R-squared	0.59	0.56	0.59	0.56
Observations	11,020	9,365	11,020	9,365
Number of Firms	1,243	1,065	1,243	1,065
Number of Banks	27	26	27	26

Bank controls: ROA, dep/assets, income gap, ln(assets), unused credit/assets, liab./assets, loans/assets. Standard errors clustered by bank. Sample: 2021:Q1-2022:Q4.

Credit Supply: Omitting Firm-Time FE

Back

- Results remain when omitting firm-time FE

	(i)	(ii)	(iii)	(iv)
Δ Value AFS	4.58**	6.09**	3.47**	5.45**
	(1.91)	(2.31)	(1.51)	(2.32)
Δ Value HTM			-4.59**	-3.15
			(2.05)	(2.04)
Fixed Effects				
Location × Size × Time	✓		✓	
Location × Size × Time × Industry		✓		✓
Bank & AC × Time	✓	✓	✓	✓
Bank Controls	✓	✓	✓	✓
R-squared	0.25	0.46	0.26	0.46
Observations	51,242	25,906	51,242	25,906
Number of Firms	12,544	7,719	12,544	7,719
Number of Banks	28	28	28	28

Bank controls: ROA, dep/assets, income gap, ln(assets), unused credit/assets, liab./assets, loans/assets. Standard errors clustered by bank. Sample: 2021:Q1-2023:Q1.

Bank Capital Positions

Back

- Effects are more pronounced for low-capitalized banks

	(i)	(ii)	(iii)
Δ Value AFS	5.85	6.04	7.49
	(4.51)	(4.90)	(5.12)
Δ Value AFS × CET1	-1.07*		
	(0.58)		
Δ Value AFS × Tier1		-1.19*	
		(0.67)	
Δ Value AFS × Total			-1.52**
			(0.70)
Firm × Time FE; Bank FE	✓	✓	✓
Bank Controls	✓	✓	✓
Bank Controls × Δ Value AFS	✓	✓	✓
R-squared	0.57	0.57	0.57
Observations	13,038	13,038	13,038
Number of Firms	1,289	1,289	1,289
Number of Banks	27	27	27

Bank controls: ROA, dep/assets, income gap, ln(assets), unused credit/assets, liab./assets, loans/assets, capital buffer. Standard errors clustered by bank. Sample: 2021:Q1-2023:Q1.

Interest Rate Risk Channel: IV-Estimation

Back

	(i)	(ii)	(iii)	(iv)
Δ Value AFS	6.19***	7.71***	14.05**	6.81***
	(1.65)	(1.47)	(6.12)	(1.84)
Δ Net Income				0.37
				(2.84)
Δ Deposits				-0.05
				(0.19)
Δ Probability Default				42.33
				(44.99)
Δ Provision Losses				6.20
				(6.33)
Firm × Time FE	✓	✓	✓	✓
Bank FE; AC × Time FE	✓	✓	✓	✓
Bank Controls	✓	✓	✓	✓
Trading Book Securities		✓		
Estimator	OLS	OLS	IV	OLS
First Stage F-Stat.			45	
R-squared	0.57	0.57	0.57	0.57
Observations	13,038	13,027	13,038	13,038

Bank controls: ROA, dep/assets, income gap, ln(assets), unused credit/assets, liab./assets, loans/assets, AFS-value/assets. Standard errors clustered by bank. Sample: 2021:Q1-2023:Q1.

Effects at the Firm level - Credit Line Space

Back

- Changes of firm outcomes similarly for firms without CL space

	Δ Total Debt		Investment		Δ Cash	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Δ Value AFS	6.17**		5.31**		10.46**	
	(3.09)		(2.67)		(4.48)	
Δ Value AFS × No CL		6.81**		6.69**		10.85**
		(3.10)		(2.65)		(4.54)
Δ Value AFS × CL		-3.16		-16.49**		4.40
		(8.69)		(7.23)		(10.41)
Fixed Effects						
Firm	✓	✓	✓	✓	✓	✓
Time	✓	✓	✓	✓	✓	✓
Firm Controls	✓	✓	✓	✓	✓	✓
R-squared	0.73	0.73	0.72	0.72	0.66	0.66
Observations	69,934	69,934	82,472	82,472	81,900	81,900
Number of Firms	19,046	19,046	22,162	22,162	22,116	22,116
Number of Banks	29	29	30	30	30	30

Firm controls: cash, net income, fixed assets, liabilities, ln(assets), unused credit/debt, observed credit/debt, sales, weighted bank controls. Standard errors clustered by firm. Sample: 2021:Q1-2023:Q1.