Why Bank Net Interest Margins Are Stable - Insights from the Asset Side

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Standard Bank Business Model

- Banks perform maturity transformation:

long-term fixed-rate assets	short-term liabilities

- Main source of banks' profit is net interest income (NII):
  - total interest income
  - minus total interest expenses
- Maturity transformation can expose banks to interest rate risk.

Net Interest Margin

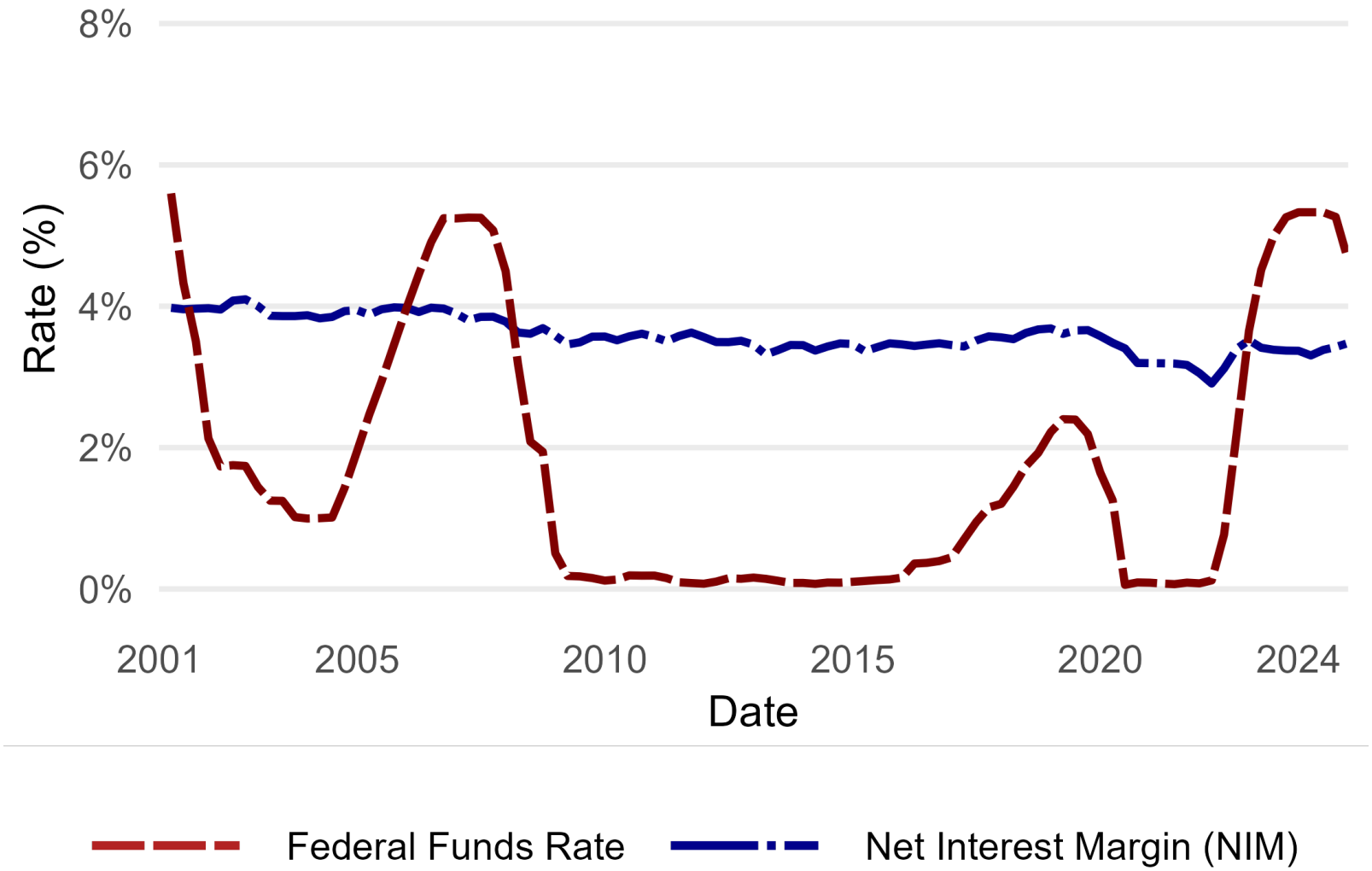
- A common measure to study a bank's exposure to interest rate risk is the net interest margin (NIM):

$$\text{NIM} = \frac{\text{interest income} - \text{interest expense}}{\text{total assets}}$$

- NIM is negatively related to the short-term policy rate if interest expenses are more policy-rate sensitive than interest income
- However, the existing literature documents stable NIM for banks, e.g., Flannery (1981, JF), English (2002), and Drechsler, Savov, and Schnabl (2021, JF)

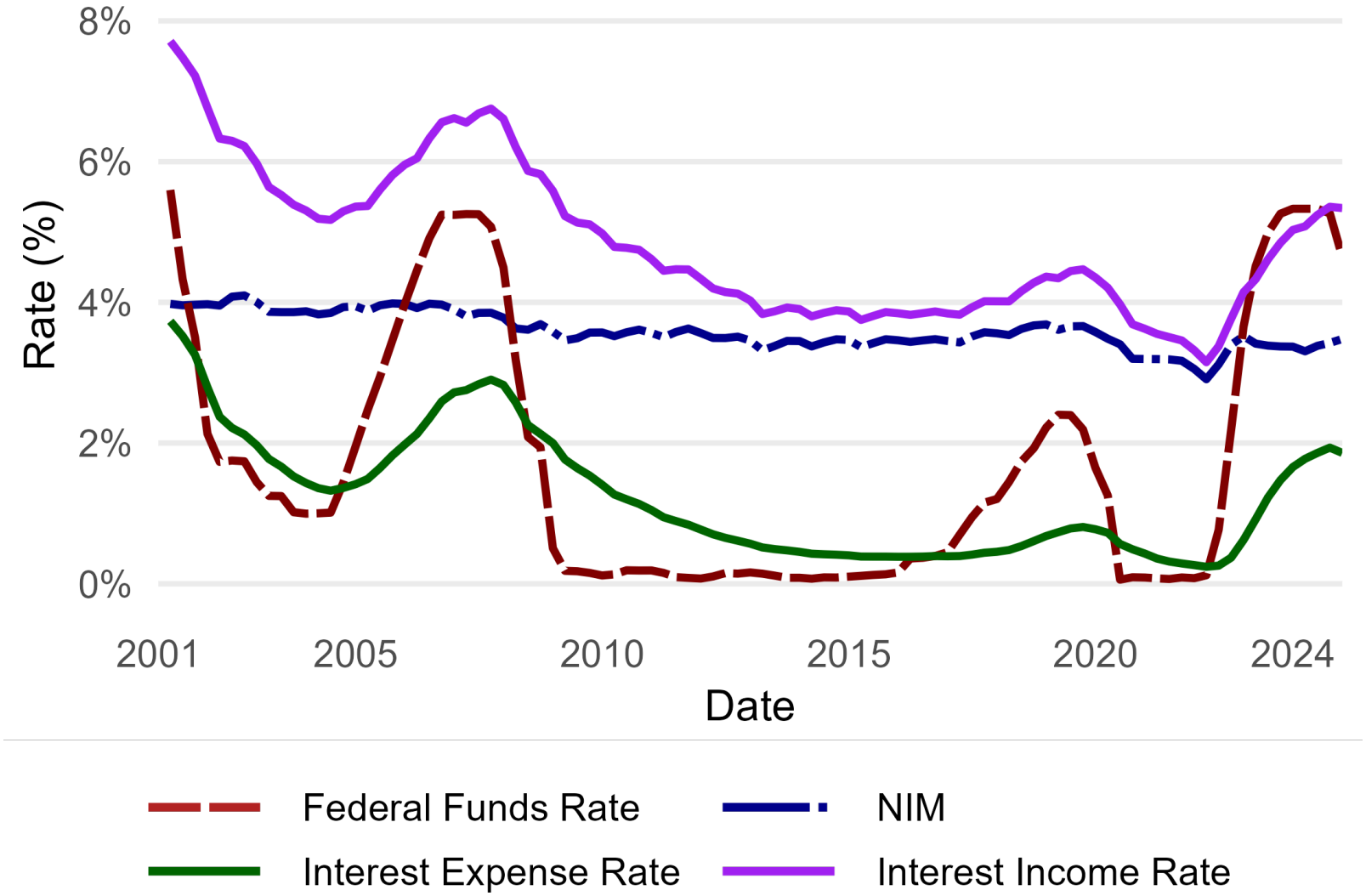
  $\Rightarrow$ Bank profitability is not very exposed to interest rate risk

Stable Net Interest Margin



Data: US commercial bank Call Reports and the effective federal funds rate

Stable Net Interest Margin



Data: US commercial bank Call Reports and the effective federal funds rate

Why are NIM Stable Despite Maturity Transformation?

- Drechsler, Savov, and Schnabl (2021, JF), hereafter **DSS**:
  Banks have market power over deposits
  - Deposit rates are low even as the policy rate rises
  - Banks' interest expense has a low sensitivity to interest rates
- **My paper:** Banks actively manage assets across rate environments
  - Without active management, interest income would be more policy-rate sensitive than interest expenses
  - Banks reach for yield when the policy rate falls
    $\rightarrow$ Stabilizes NIM but increases credit and duration risk

Contribution to the Literature

- Cash-flow perspective on interest rate risk:

  Drechsler, Savov, and Schnabl (2021, JF), Begenau & Stafford (2025), Hoffman et al. (2019, RFS)

- Market-value perspective on duration risk:

  Begenau et al. (2025), Jiang et al. (2024, JFE), Drechsler et al. (2025, JF)

- Risk-taking channel of monetary policy:

  Maddaloni & Peydró (2011, RFS), Jiménez et al. (2014, Econometrica), Ioannidou et al. (2015, RF), Dell'Ariccia et al. (2017, JF), Paligorova & Santos (2017, JFI)

Results Indicate: Banks Target a Stable NIM

Potential Motives Include:

- **Earnings at Risk (EaR) management:**

  "Our overall goal is to manage interest rate risk so that movements in interest rates do not significantly adversely affect earnings and capital."

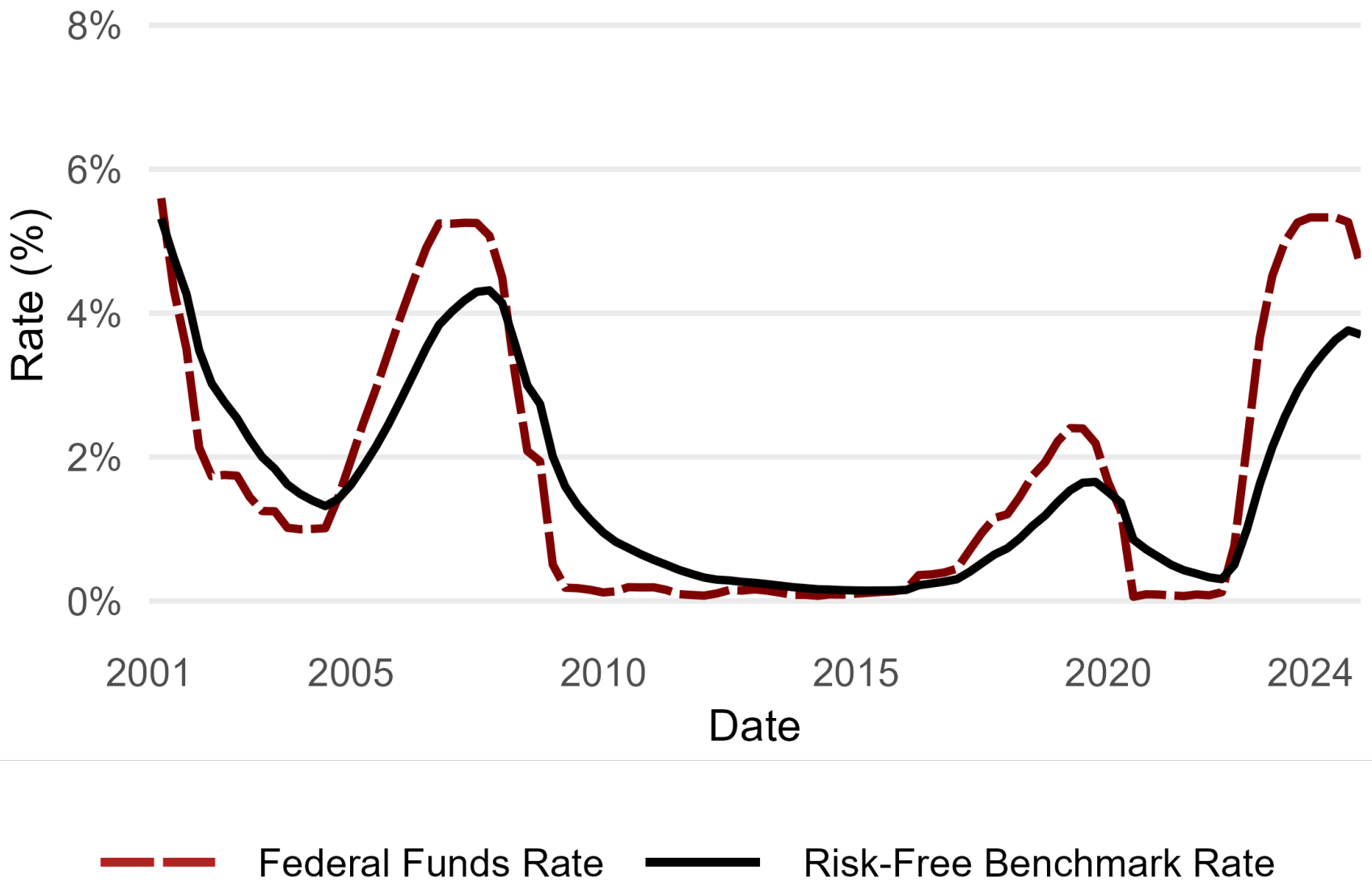
  — *Bank of America, 2017 Annual Report*

- **Earnings smoothing**:
  - Acharya and Lambrecht (2015, RFS): pressure on bank managers to meet analysts' earnings expectations
  - Graham et al. (2005, JAE): 78% of CFOs would sacrifice long-term value to meet earnings targets

Methodology

- Quarterly US bank Call Reports: 6,150 commercial banks, 1997-2024 (main sample 2001-2024)
- Key step: Decompose at bank level the interest income rate into a bank-specific risk-free benchmark rate and a credit spread
  1. Risk-free benchmark rate is the value-weighted average of federal funds rates (FFR) prevailing when outstanding assets were priced
  2. Implied credit spread is the difference between the interest income rate and the risk-free benchmark rate

Decomposing Banks' Interest Income Rate



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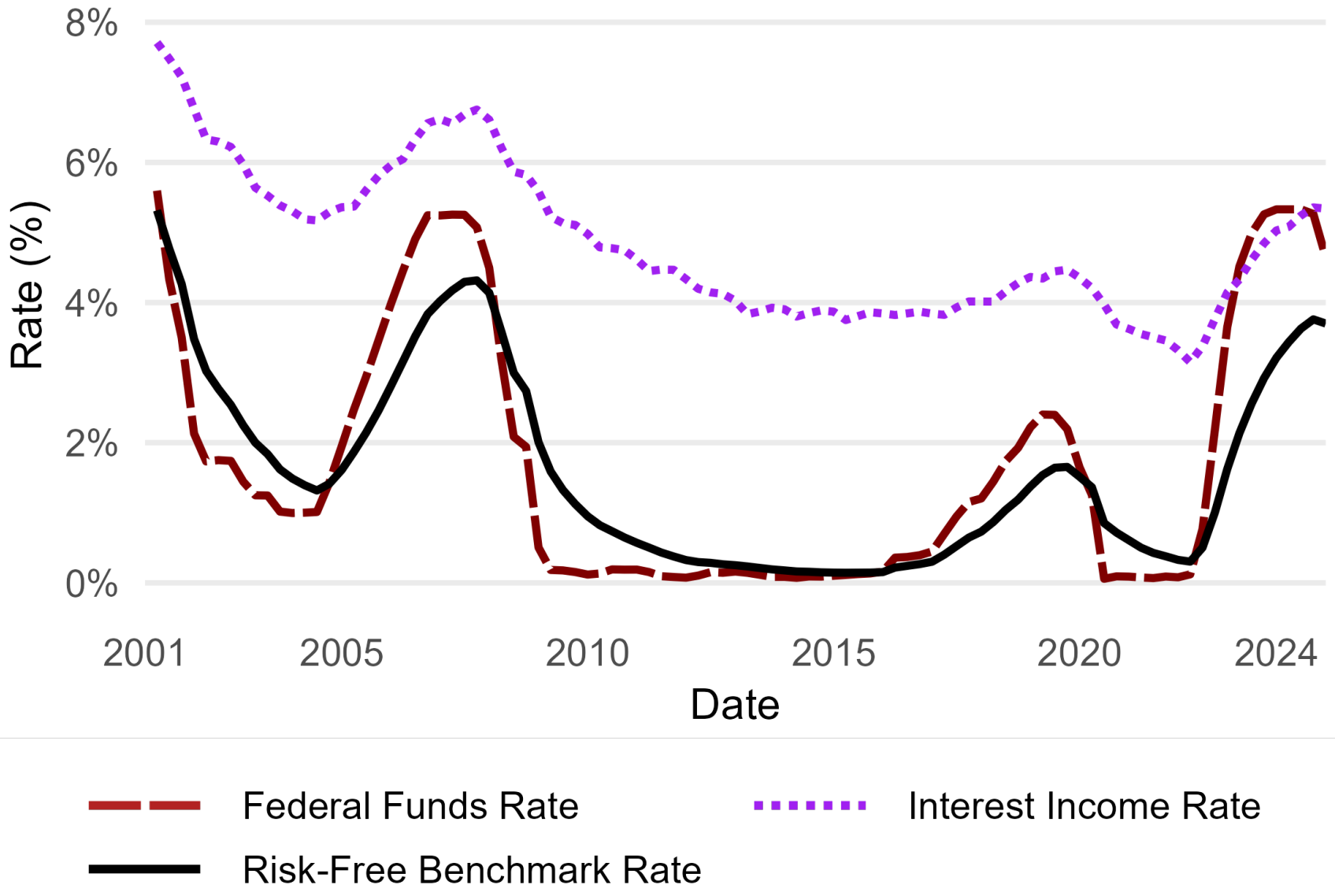

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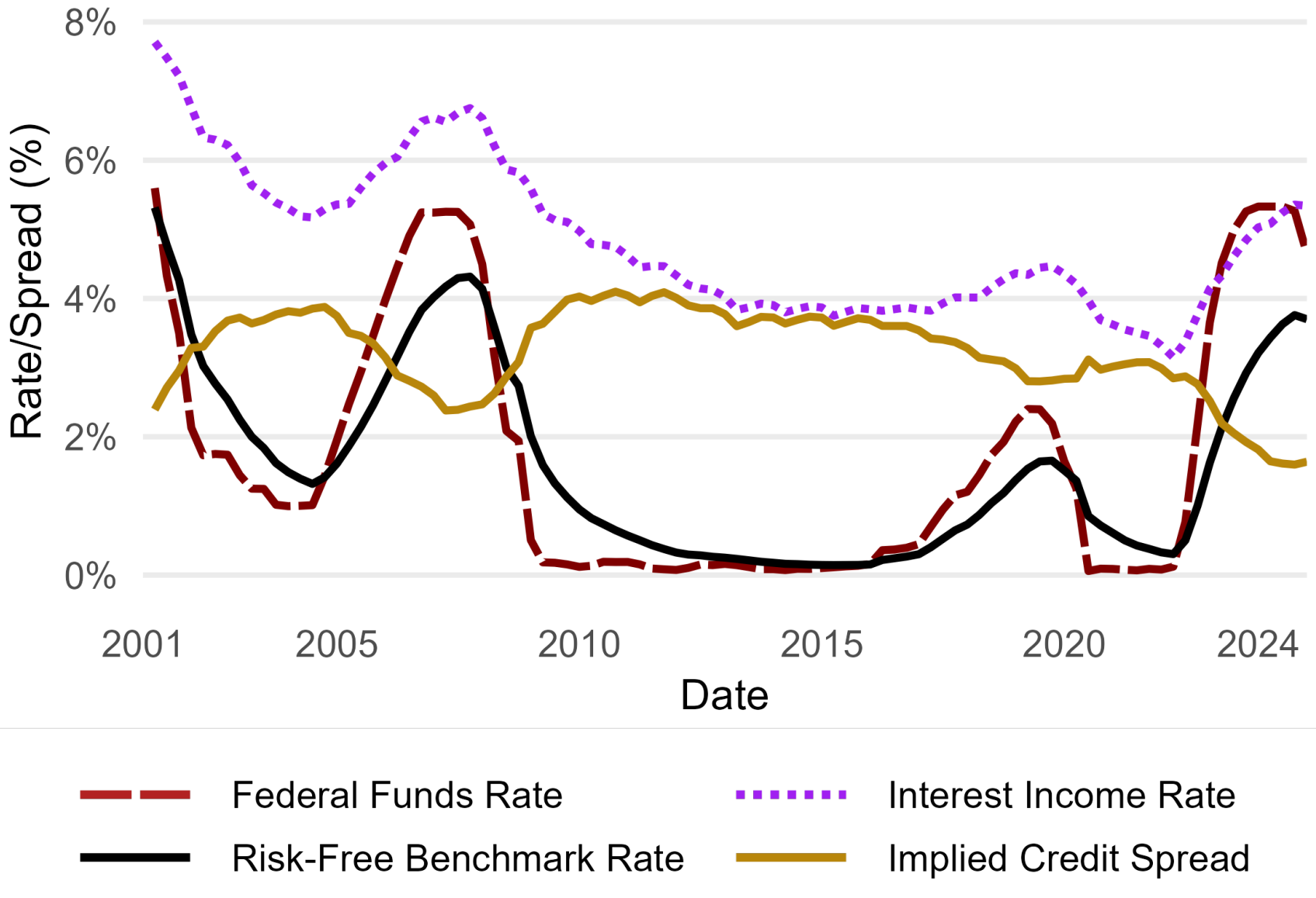


Sensitivity Analysis

- Following DSS, I estimate for each bank i the NIM sensitivity:

$$\Delta \text{NIM}_{it} = \alpha_i + \sum_{\tau=0}^{3} \beta_{i,\tau}^{\text{NIM}} \, \Delta f_{t-\tau} + \epsilon_{it}.$$

$$\beta_i^{\text{NIM}} = \sum_{\tau=0}^{3} \beta_{i,\tau}^{\text{NIM}}.$$

  and analogously the sensitivities for r^{exp}, r^{inc}, r_f^{bench}, s, $\text{NIM}^{\text{counter}}$

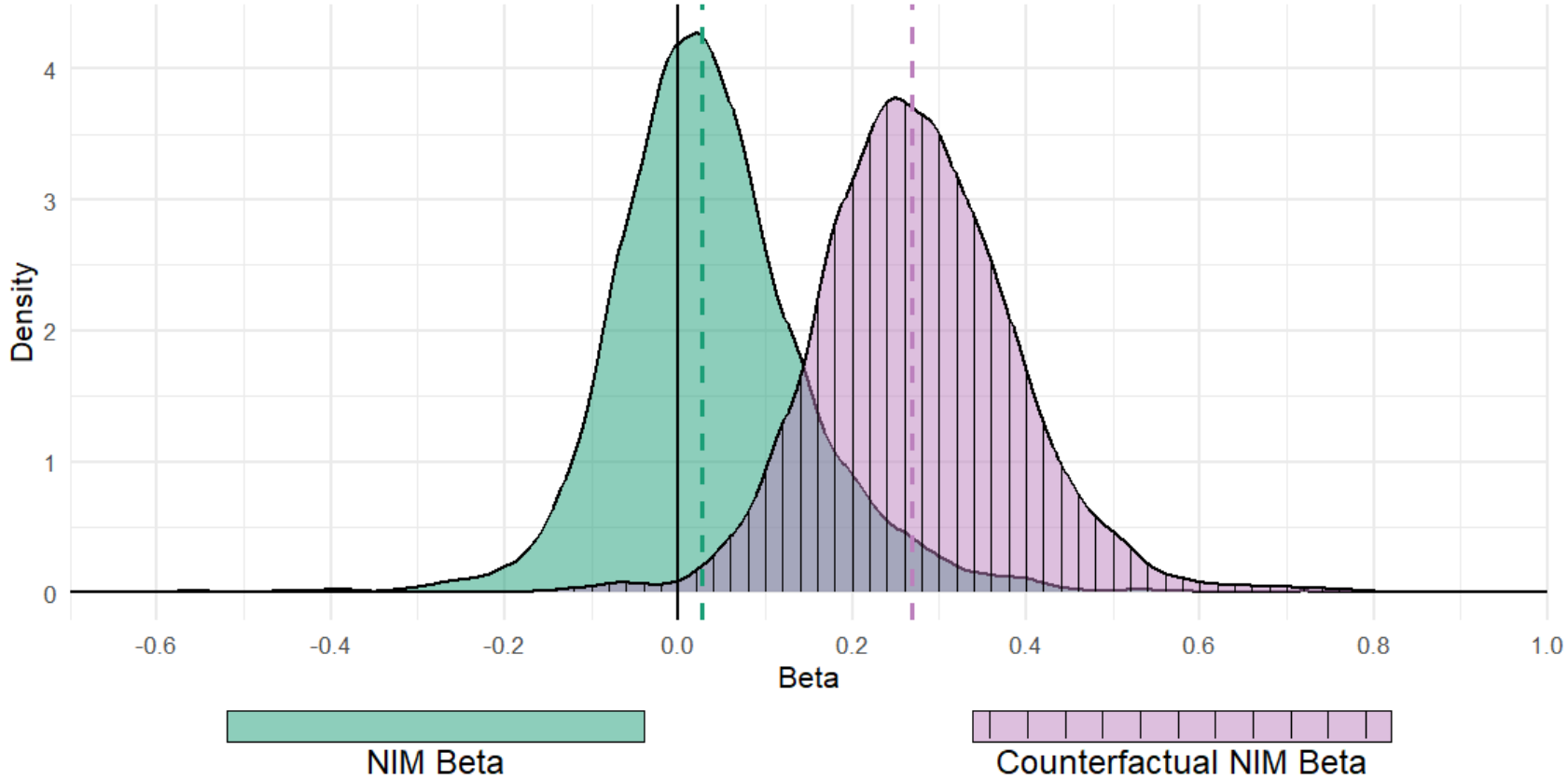
- Condition for a bank to have no interest rate risk:

$$\beta^{\text{NIM}} = 0$$

  which is equivalent to

$$\begin{aligned} \beta^{\text{exp}} &= \beta^{\text{inc}} \\ &= \beta^{\text{bench}} + \beta^{\text{spread}} \end{aligned}$$

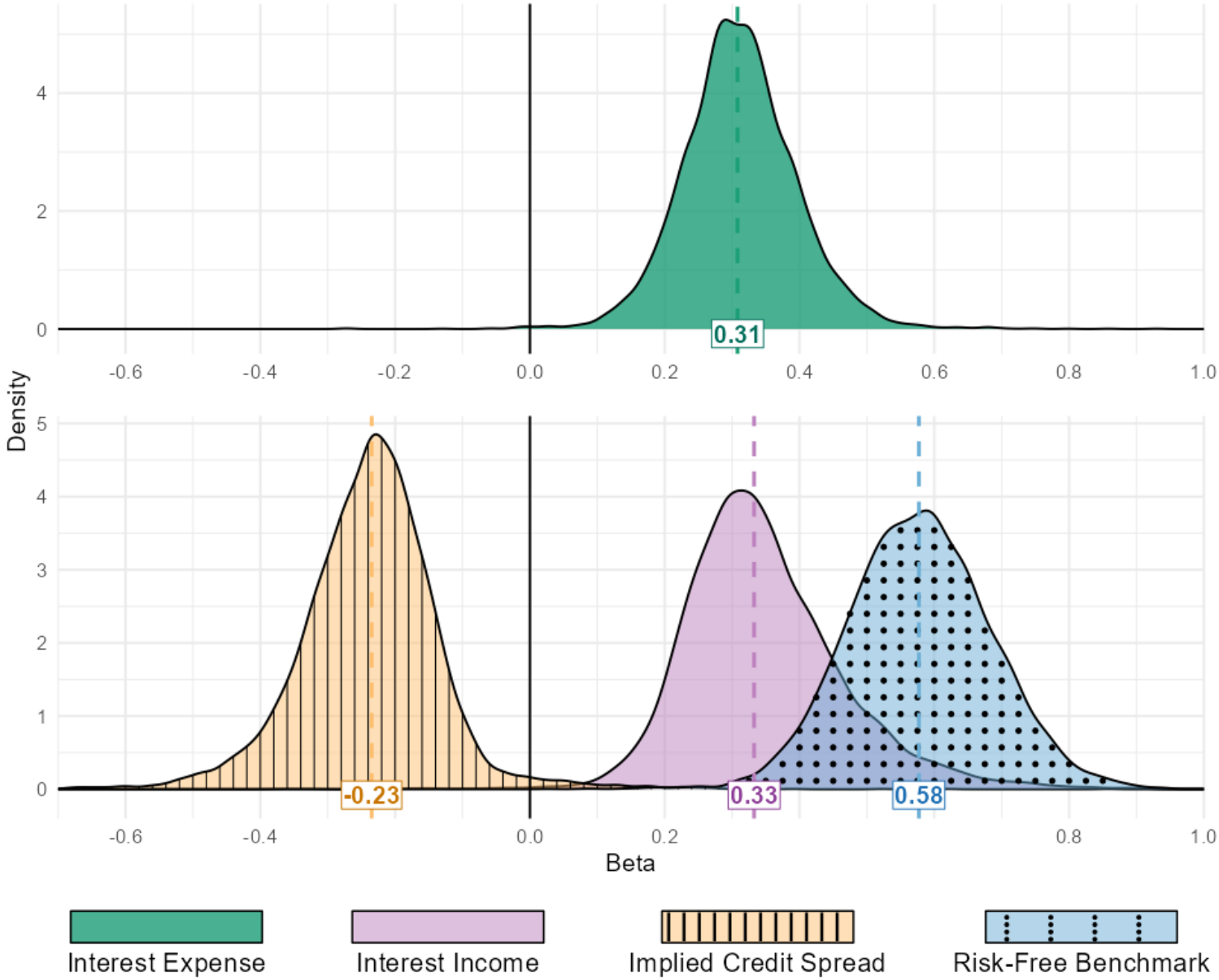
Distribution of Bank-Level NIM Sensitivities



- NIM sensitivity on avg. 4 bp per 100 bp ΔFFR; stable for 76% of banks
- Counterfactual NIM sensitivity 28 bp per 100 bp ΔFFR; positive and significant for 93% of banks

Summary Statistics | Robustness | Cross-Section

Distribution of Bank-Level Rate Sensitivities



Credit Spread Increases and Credit Risk

- **Default risk measure:**

$$\mathrm{NP}_{i,t}^{(L+S)} = \frac{\text{Non-Performing Loans} + \text{Credit-Impaired Securities}}{\text{Total Assets}}$$

- **First-stage standardized implied credit spread changes:**

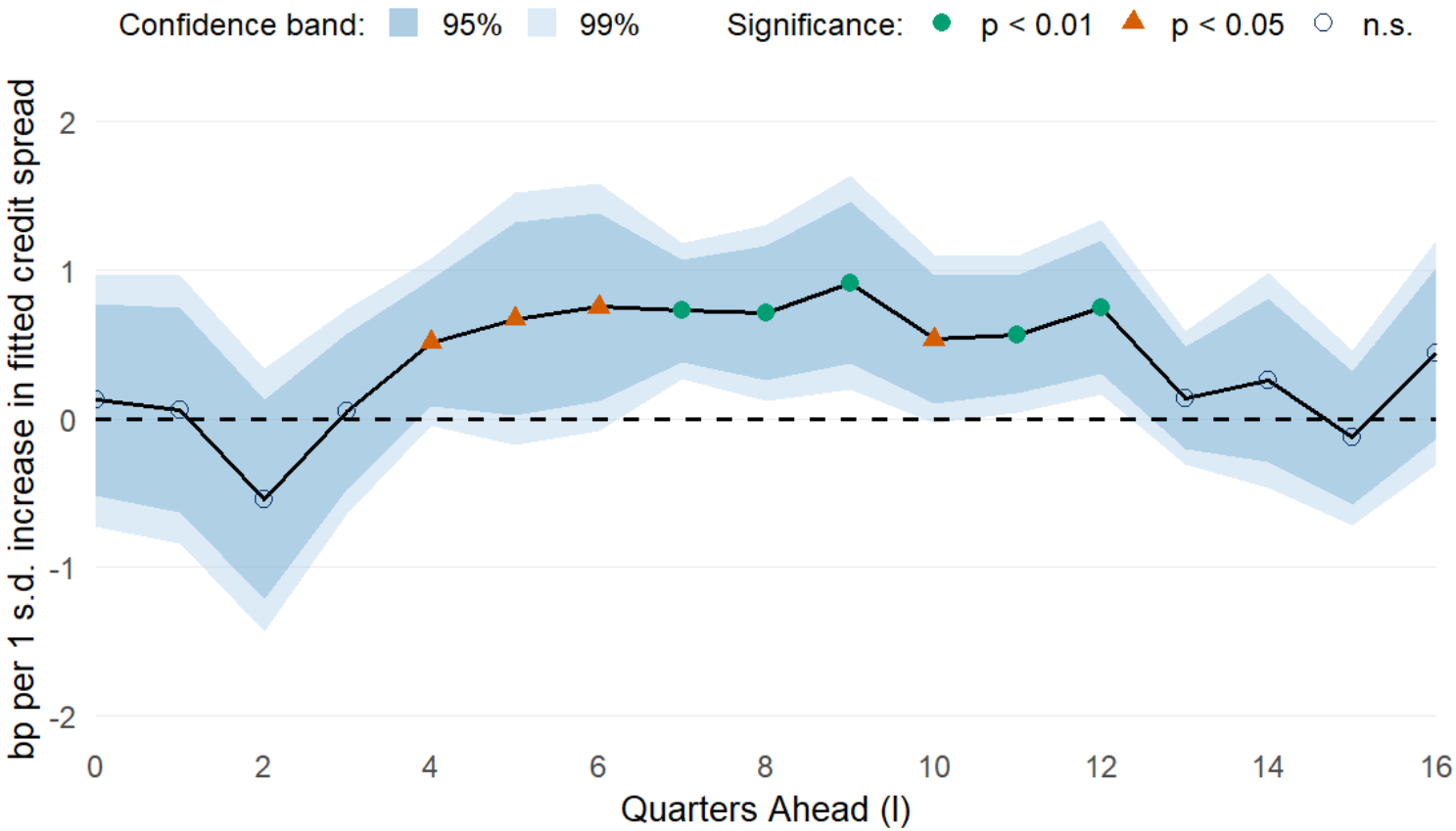
$$\widehat{R}_{i,t} = \widehat{\alpha}_i + \sum_{\tau=0}^{3} \widehat{\beta}_{i,\tau}^{\text{spread}} \, \Delta f_{t-\tau}, \qquad z\widehat{R}_{i,t} = \frac{\widehat{R}_{i,t} - \overline{\widehat{R}}_{i,\cdot}}{\mathrm{sd}(\widehat{R}_{i,\cdot})}$$

- **Second-stage local projections** ($\ell = 0, \ldots, 16$):

$$\Delta \log\left(1 + \mathrm{NP}_{i,t+\ell}^{(L+S)}\right) = \gamma_i + \psi_t + \delta_\ell \, z\widehat{R}_{i,t-1} + u_{i,t+\ell}$$

  - γ_i, ψ_t: bank and time fixed effects

Higher Credit Spreads Predict Increase in NP Ratio



- 1 s.d. credit spread increase (13 bp): cumulative NP increase $\approx$ 6 bp
- 100 bp FFR cut $\rightarrow$ 24 bp credit spread increase $\rightarrow \approx$ 11 bp (13%) NP increase

Cross-Sect.

Credit Spread Increases and Duration Risk

- **First-stage standardized implied credit spread changes:**

$$\widehat{R}_{i,t} = \widehat{\alpha}_i + \sum_{\tau=0}^{3} \widehat{\beta}_{i,\tau}^{\text{spread}} \, \Delta f_{t-\tau}, \qquad z\widehat{R}_{i,t} = \frac{\widehat{R}_{i,t} - \overline{\widehat{R}}_{i,\cdot}}{\text{sd}(\widehat{R}_{i,\cdot})}$$

- **Second-stage contemporaneous estimates:**

$$\Delta Y_{i,t} = \gamma_i + \psi_t + \beta \, z\widehat{R}_{i,t} + X'_{i,t}\theta + u_{i,t},$$

  - $Y_{i,t}$: measures of duration risk and balance-sheet composition
  - $X_{i,t} = \{\ln(\text{Assets}), \text{ROA}, \text{Equity}/\text{Assets}\}$
  - γ_i, ψ_t: bank and time fixed effects

Credit Spread Increases and Duration Risk I

	Δ 1Y repricing gap (bp)		Δ 1Y short-term liabilities share (bp)		Δ 1Y short-term assets share (bp)	
	(1)	(2)	(3)	(4)	(5)	(6)
Δ Fitted Credit Spread	**22.34*** **	**22.81*** **	**7.18*** **	**7.63*** **	**-15.17*** **	**-15.17*** **
	(3.42)	(3.59)	(2.37)	(2.55)	(1.90)	(1.90)
Controls	No	Yes	No	Yes	No	Yes
Bank & Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	495k	494k	495k	494k	495k	494k
R^2	0.47	0.49	0.55	0.59	0.03	0.03

Controls: ln(Assets), ROA, Equity/Assets.
Two-way clustered standard errors (bank & time) in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

- 100 bp policy rate cut $\rightarrow$ 24 bp credit spread increase $\rightarrow \approx$ 41 bp wider gap

Credit Spread Increases and Duration Risk II

	Δ Asset maturity (weeks)		Δ Sec maturity (weeks)		Δ Loan maturity (weeks)	
	(1)	(2)	(3)	(4)	(5)	(6)
Δ Fitted Credit Spread	**0.45*** **	**0.44*** **	0.19	0.18	0.03	0.03
	(0.10)	(0.10)	(0.12)	(0.12)	(0.05)	(0.05)
Controls	No	Yes	No	Yes	No	Yes
Bank & Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	495k	494k	487k	486k	495k	493k
R^2	0.03	0.03	0.03	0.03	0.03	0.03

Controls: ln(Assets), ROA, Equity/Assets.
Two-way clustered standard errors (bank & time) in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

- 100 bp policy rate cut $\rightarrow$ 24 bp credit spread increase $\rightarrow \approx$ 0.83 week longer asset maturity

Credit Spread Increases and Asset Composition

	Δ Loans share (bp)		Δ Sec share (bp)		Δ Interbank share (bp)		Asset growth (bp)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ Fitted Credit Spread	**15.05*** **	**14.29*** **	-31.48	-31.50	**-28.33*** **	**-27.76*** **	0.30	-2.12
	(2.00)	(1.91)	(29.24)	(29.32)	(2.64)	(2.60)	(3.29)	(3.31)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Bank & Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	495k	494k	495k	494k	495k	494k	495k	494k
R^2	0.07	0.08	0.23	0.23	0.04	0.05	0.10	0.11

Controls: ln(Assets), ROA, Equity/Assets.
Two-way clustered standard errors (bank & time) in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

- 100 bp policy rate cut $\rightarrow$ 24 bp credit spread increase $\rightarrow \approx$ 28bp higher loan share

Conclusion

Banks actively manage assets, keeping NIM stable

- If credit spreads were constant, NIM $\downarrow$ when the federal funds rate $\downarrow$ (and $\uparrow$ when $\uparrow$)
- Credit spreads $\uparrow$ when the federal funds rate $\downarrow$ (and $\downarrow$ when $\uparrow$)
  $\Rightarrow$ NIM remains stable
- Higher implied credit spreads $\rightarrow$ higher credit and duration risk

Policy implication: Interest rate risk should not be assessed in isolation from credit and duration risk in stress testing and capital frameworks

Thank you for your attention!

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Summary Statistics of Estimation Results

	Mean	SD	% Sig.	% Sig.+	% Sig.−	$\overline{R}^2$
Net interest margin (NIM)	**0.037**	0.140	24%	23%	9%	0.114
Interest expense	**0.311**	0.086	99%	99%	0%	0.600
Interest income	**0.348**	0.141	96%	97%	0%	0.308
Risk-free benchmark	**0.579**	0.113	100%	100%	0%	0.875
Credit spread	**−0.238**	0.128	86%	0%	90%	0.179
Counterfactual NIM	**0.275**	0.119	91%	93%	0%	0.338

Note. Quarterly data for U.S. commercial banks, 2001–2024.
Total banks: 6,150. Total observations: 495,439.

Back | η Components | Asset Composition | Repricing Maturity Distribution

Interest Income

- Accounting for assets that do not earn interest:

$$r_t^{\text{inc}} = \lambda_t \, \bar{r}_t^{\text{inc}}$$

  - λ_t: share of interest-earning assets
  - $\bar{r}_t^{\text{inc}}$: interest income rate on interest-earning assets

- Accounting for interest-earning assets that do not change their interest rate between $t-1$ and t:

$$r_t^{\text{inc}} = \lambda_t \left(\eta_t \, \hat{r}_t^{\text{inc}} + (1-\eta_t) \, \tilde{r}_t^{\text{inc}} \right)$$

  - η_t: share of new and floating-rate assets
  - $\hat{r}_t^{\text{inc}}$: interest income rate on new and floating-rate assets
  - $(1-\eta_t)$: share of pre-existing fixed-rate interest-earning assets
  - $\tilde{r}_t^{\text{inc}}$: int. inc. rate on pre-existing fixed-rate interest-earning assets

Back

Robustness

I conduct a battery of robustness tests, as follows:

1. Asymmetry to federal funds rate increases and decreases Asymmetry FED
2. Asymmetry to good and bad financial conditions Asymmetry FIN
3. Estimation on the loan- and security-level Loans & Secs
4. Focusing on the largest 10% and 5% of banks 10% 5%
5. Estimation at the top-tier bank holding company level Top-Tier
6. Estimation over the full sample (1997-2024) Full Horizon
7. Alternative constructions of r_f^{bench} Alt. Constr.
8. Alternative amortization and bucket weight assumptions Alt. Algos

Back

Change in Interest Income Rate

- One-period change in interest income rate between $t-1$ and t:

$$\begin{aligned}
\Delta r_t^{\text{inc}} &= \Delta\left(\lambda_t\, \overline{r}_t^{\,\text{inc}}\right) \\
&= \lambda_{t-1}\, \Delta \overline{r}_t^{\text{inc}} + \overline{r}_t^{\text{inc}}\, \Delta\lambda_t \\
&= \lambda_{t-1}\, \Delta\left(\, \eta_t\, \hat{r}_t^{\,\text{inc}} + (1-\eta_t)\, \tilde{r}_t^{\,\text{inc}}\right) + \overline{r}_t^{\text{inc}}\, \Delta\lambda_t \\
&= \lambda_{t-1}\, \eta_t\, \Delta \hat{r}_t^{\text{inc}} + \overline{r}_t^{\text{inc}}\, \Delta\lambda_t
\end{aligned}$$

- Decomposition of changes in interest income rates:

$$\begin{aligned}
\Delta r_t^{\text{inc}} &= \underbrace{\lambda_{t-1}\, \eta_t\, (f_t - r_{f,t-1}^{\text{bench},\eta})}_{\text{Risk-Free Benchmark}} + \underbrace{\lambda_{t-1}\, \eta_t\, (s_t^{\eta} - s_{t-1}^{\eta})}_{\text{Credit Spread}} + \underbrace{\overline{r}_t^{\text{inc}}\, \Delta\lambda_t}_{\text{Asset Composition}} \\
&= \Delta r_{f,t}^{\text{bench}} + \Delta s_t + \Delta \mathcal{A}_t
\end{aligned}$$

Expansion Back

Algorithm to Estimate $r_{f,t}^{\text{bench}}$

Algorithm broadly follows steps in Begenau et al. (2025).

1. Initialize in 1997:Q2: Treat all loans and securities as newly issued.
2. Quarterly roll-down: Move all outstanding positions one quarter closer to maturity or the next rate reset.
3. Amortization and sales: Assume linear principal amortization for loans, so amortization for securities, and allow premature sales when indicated by shifts across repricing maturity buckets.
4. Rate assignment: Assign the current federal funds rate as risk-free rate to new assets, resetting floating-rate assets, and interbank assets.
5. Rate persistence: Retain previously assigned rates for non-repricing assets.
6. Risk-free benchmark: Compute the value-weighted risk-free benchmark rate.

Roll-Down Illustration Back

Summary Statistics: η Components

η (in %)			
η	$\eta^{\text{replacement}}$	η^{growth}	η^{floating}
36.74 (11.12)	**18.83** (6.90)	**1.60** (1.18)	**16.28** (9.24)

Decomposition of $\eta^{\text{replacement}}$		
Scheduled Maturing	Amortizing	Pre-Maturing
9.87 (3.33)	**6.23** (2.27)	**2.73** (1.21)

Note. Mean shares of interest-earning assets adjusting per quarter.

- Average share of interest-earning assets: $\lambda = 93\%$
- On average, 34% of assets adjust their rate each quarter ($\lambda \times \eta$)
- Average repricing maturity of interest-earning assets: 3.8 years

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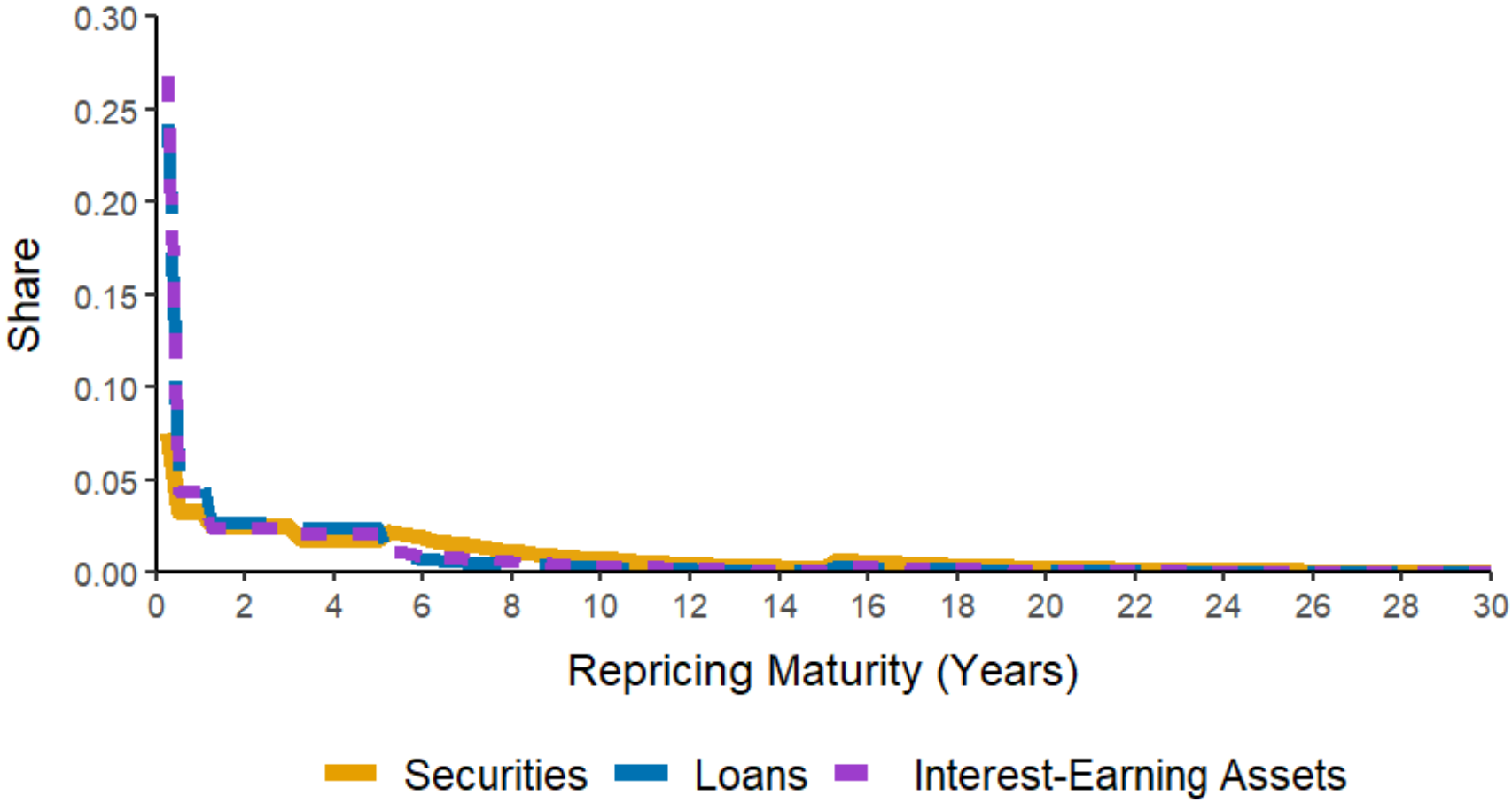
Repricing Maturities Distribution



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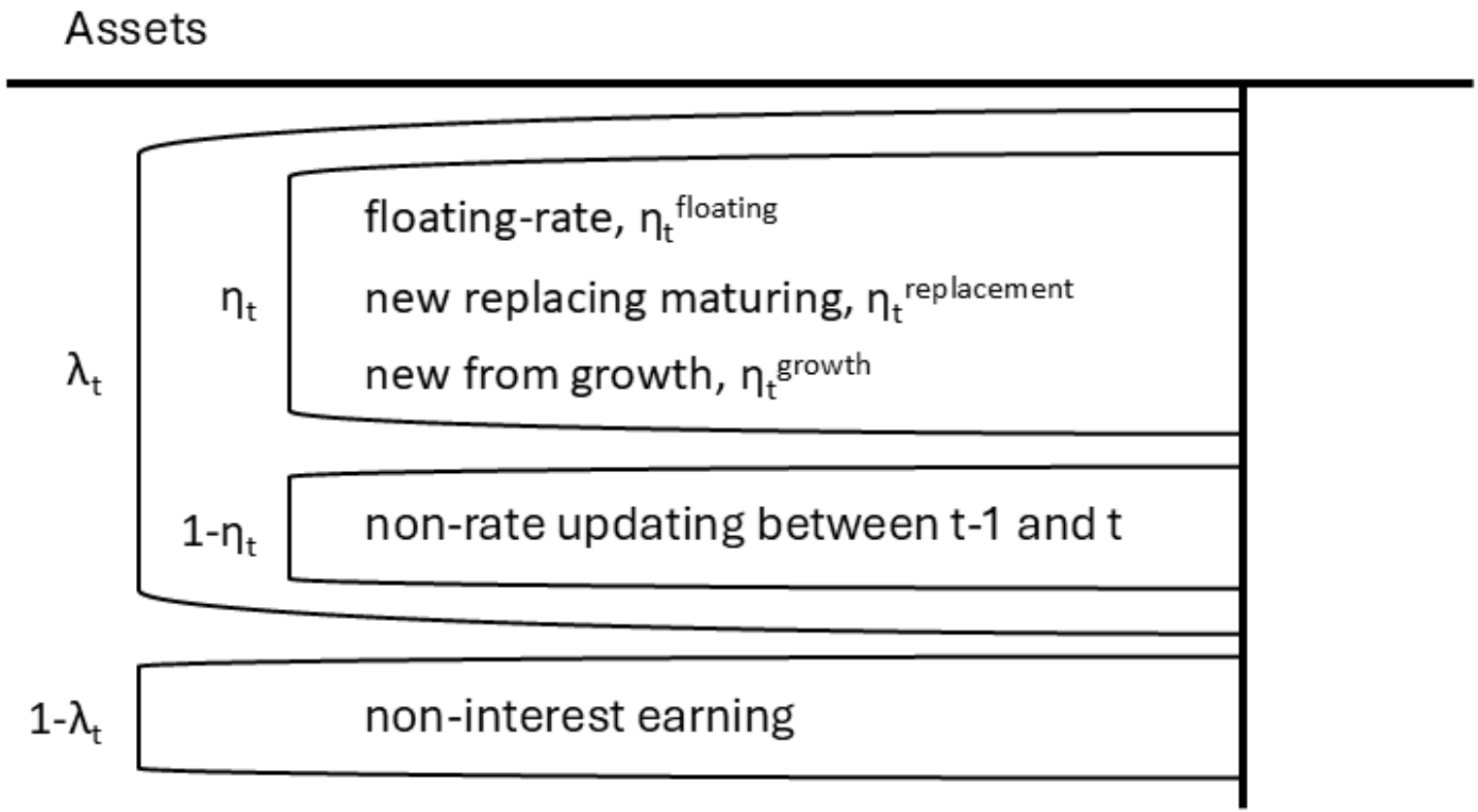
Asset Share



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Estimating Quarterly Changes

$$\Delta r_t^{\text{inc}} = \underbrace{\Delta r_{f,t}^{\text{bench}}}_{\text{Risk-Free Benchmark}} + \underbrace{\Delta s_t}_{\text{Credit Spread}} + \underbrace{\Delta \mathcal{A}_t}_{\text{Asset Composition}}$$

Estimation approach:

1. Estimate $\Delta r_{f,t}^{\text{bench}}$
2. Obtain $\Delta s_t = \Delta r_t^{\text{inc}} - \Delta r_{f,t}^{\text{bench}} - \Delta \mathcal{A}_t$

Back

Expansion

The decomposition follows from the expansion:

$$\begin{aligned}\Delta(\lambda_t\, \overline{r}_t^{\text{inc}}) &= \lambda_t\, \overline{r}_t^{\text{inc}} - \lambda_{t-1}\, \overline{r}_{t-1}^{\text{inc}} \\ &= \lambda_t\, \overline{r}_t^{\text{inc}} - \lambda_{t-1}\, \overline{r}_t^{\text{inc}} + \lambda_{t-1}\, \overline{r}_t^{\text{inc}} - \lambda_{t-1}\, \overline{r}_{t-1}^{\text{inc}} \\ &= \lambda_{t-1}\, \Delta\overline{r}_t^{\text{inc}} + \overline{r}_t^{\text{inc}}\, \Delta\lambda_t\end{aligned}$$

Back

Roll-Down Illustration: 1997:Q2 → 1997:Q3

Roll-Down for Securities (No Amortization)

	1997:Q2		**1997:Q3**	
Quarter Q	Mass	$r_{f,97:Q2}^{\text{bench,QX}}$	Mass	$r_{f,97:Q3}^{\text{bench,QX}}$
1	$M_{97:Q2}^{Q1}$	$f_{97:Q2}$	$M_{97:Q3}^{Q1}$	$\frac{M_{97:Q2}^{Q2} f_{97:Q2} + (M_{97:Q3}^{Q1} - M_{97:Q2}^{Q2}) f_{97:Q3}}{M_{97:Q3}^{Q1}}$
2	$M_{97:Q2}^{Q2}$	$f_{97:Q2}$	$M_{97:Q3}^{Q2}$	$\frac{M_{97:Q2}^{Q3} f_{97:Q2} + (M_{97:Q3}^{Q2} - M_{97:Q2}^{Q3}) f_{97:Q3}}{M_{97:Q3}^{Q2}}$
3	$M_{97:Q2}^{Q3}$	$f_{97:Q2}$	$M_{97:Q3}^{Q3}$	$\frac{M_{97:Q2}^{Q4} f_{97:Q2} + (M_{97:Q3}^{Q3} - M_{97:Q2}^{Q4}) f_{97:Q3}}{M_{97:Q3}^{Q3}}$
...	...	...	...	...

Note: Mass rolls down one bin per quarter.

→ Broadly follows roll-down algorithm in *Begenau, Piazzesi and Schneider (2025)*

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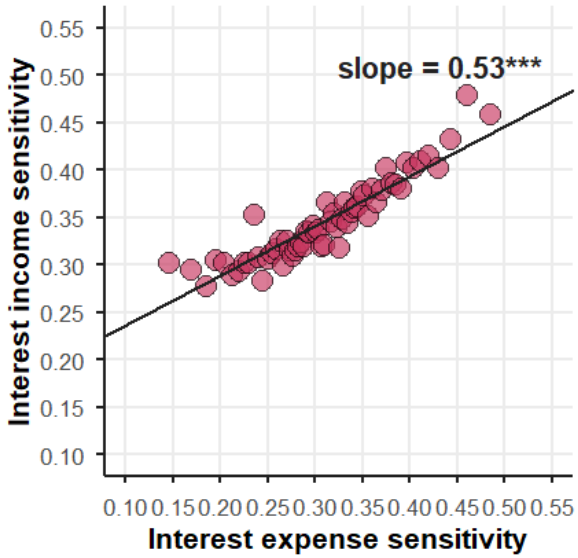
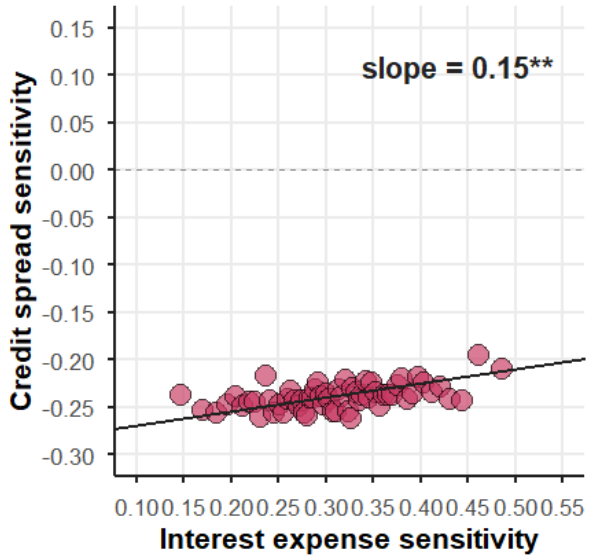
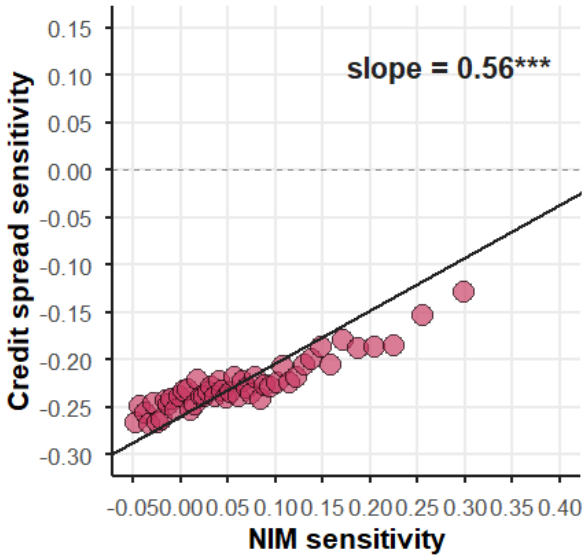
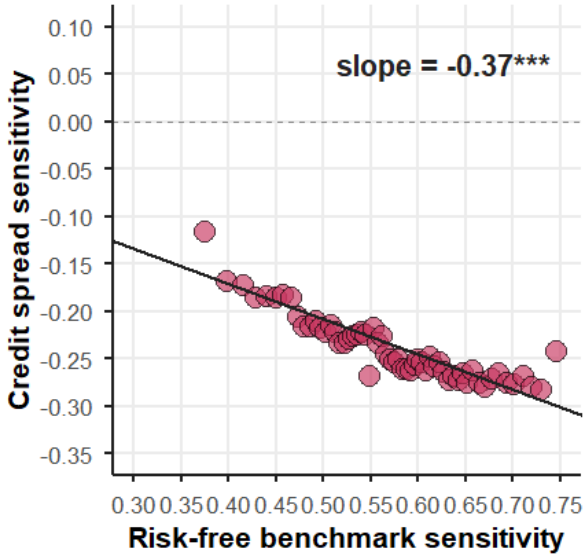
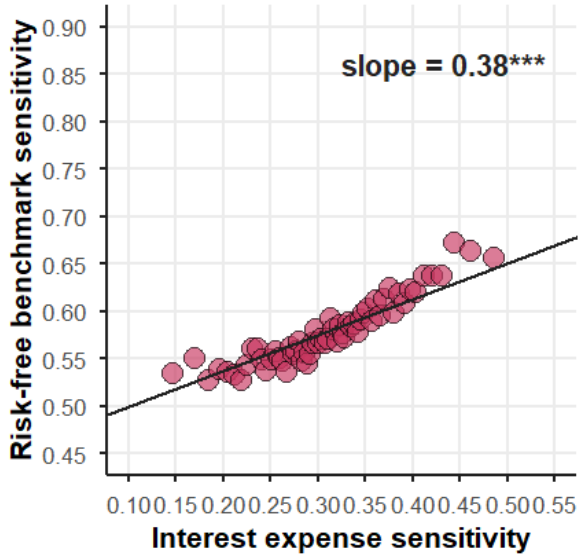
Cross-Sectional Comparison of Bank-Level Sensitivities

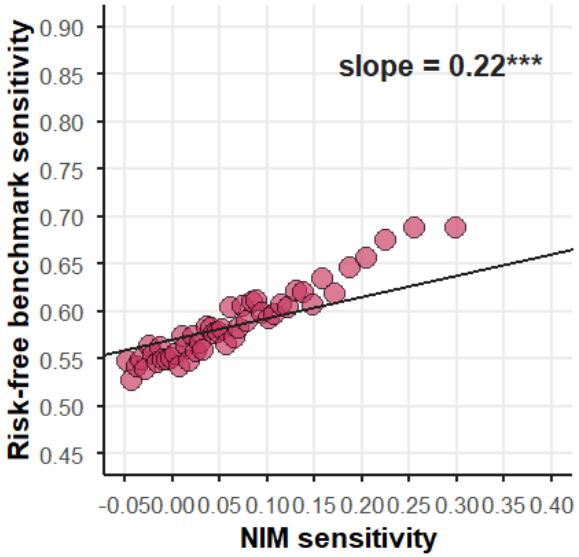












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Asymmetric Sensitivities to Fed Changes

- To allow for asymmetric responses, I also estimate separate sensitivities for increases and decreases in the policy rate:

$$\Delta X_{it} = \alpha_i + \sum_{\tau=0}^{3} \beta_{i,\tau}^{X,+} \Delta f_{t-\tau} \, \mathbf{1}\{\Delta f_{t-\tau} > 0\} + \sum_{\tau=0}^{3} \beta_{i,\tau}^{X,-} \Delta f_{t-\tau} \, \mathbf{1}\{\Delta f_{t-\tau} \leq 0\} + \epsilon_{it},$$

$$\beta_i^{X,+} = \sum_{\tau=0}^{3} \beta_{i,\tau}^{X,+}, \qquad \beta_i^{X,-} = \sum_{\tau=0}^{3} \beta_{i,\tau}^{X,-}.$$

Summary Statistics of Estimation Results

	Positive Δf			Negative Δf		
	Mean	SD	% Sig.	Mean	SD	% Sig.
Net interest margin (NIM)	**0.073**	0.237	25%	**0.023**	0.184	16%
Interest expense	**0.405**	0.156	98%	**0.265**	0.100	93%
Interest income	**0.478**	0.237	93%	**0.288**	0.186	80%
Risk-free benchmark	**0.637**	0.204	100%	**0.561**	0.115	100%
Credit spread	**−0.244**	0.262	40%	**−0.253**	0.199	71%
Counterfactual NIM	**0.317**	0.243	68%	**0.277**	0.160	77%

Note. Quarterly data for U.S. commercial banks, 2001–2024.
Total banks: 6,150. Total observations: 495,439.

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Asymmetric Sensitivities to Financial Conditions

- The Chicago Fed's Adjusted National Financial Conditions Index (ANFCI) summarizes aggregate conditions in U.S. money markets, credit markets, and the shadow banking system, excluding contemporaneous macroeconomic conditions.
- I estimate per-bank sensitivities separately for looser (ANFCI≤ 0) versus tighter (ANFCI> 0) financial conditions:

$$\Delta X_{it} = \alpha_i + \sum_{\tau=0}^{3} \beta_{i,\tau}^{X,\text{good}} \, \Delta f_{t-\tau} \, \mathbf{1}\{\text{ANFCI}_{t-\tau} \leq 0\}$$
$$+ \sum_{\tau=0}^{3} \beta_{i,\tau}^{X,\text{bad}} \, \Delta f_{t-\tau} \, \mathbf{1}\{\text{ANFCI}_{t-\tau} > 0\} + \epsilon_{it},$$

$$\beta_i^{X,\text{good}} = \sum_{\tau=0}^{3} \beta_{i,\tau}^{X,\text{good}}, \qquad \beta_i^{X,\text{bad}} = \sum_{\tau=0}^{3} \beta_{i,\tau}^{X,\text{bad}}.$$

Summary Statistics of Estimation Results: ANFCI

	Good conditions			Bad conditions		
	Mean	SD	% Sig.	Mean	SD	% Sig.
Net interest margin (NIM)	**0.034**	0.187	23.5%	**−0.013**	5.327	14.5%
Interest expense	**0.362**	0.115	99.5%	**0.207**	0.519	37.8%
Interest income	**0.396**	0.193	94.9%	**0.195**	4.860	31.0%
Risk-free benchmark	**0.595**	0.131	99.9%	**0.570**	0.383	95.2%
Credit spread	**−0.187**	0.190	66.7%	**−0.377**	5.066	49.0%

Note. Quarterly data for U.S. commercial banks, 2001–2024.
Financial conditions measured using the Chicago Fed's Adjusted National Financial Conditions Index (ANFCI).
Total banks: 6,150. Total observations: 495,439.

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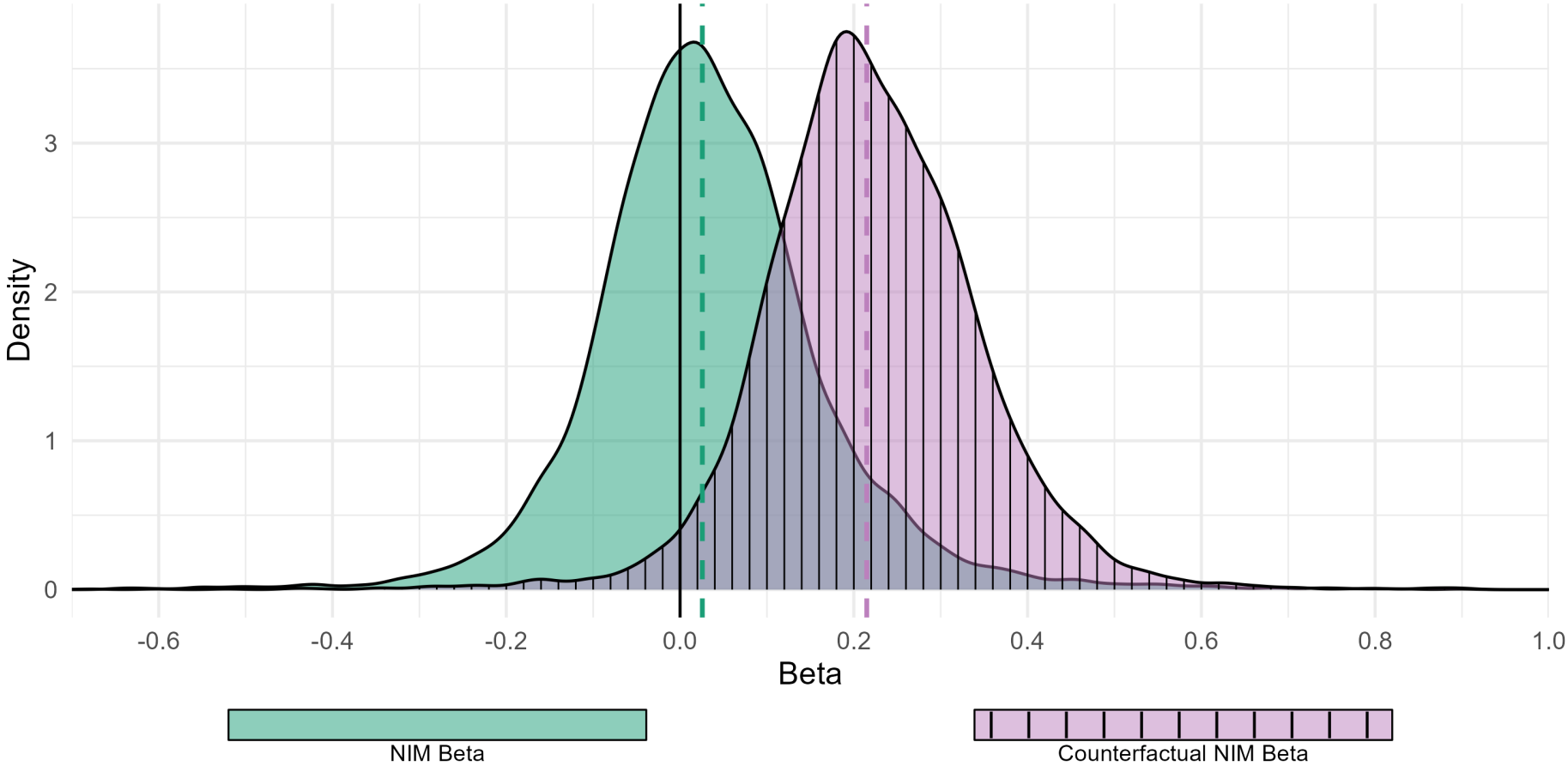
Distribution of Bank-Level NIM Sensitivities
Good Financial Conditions



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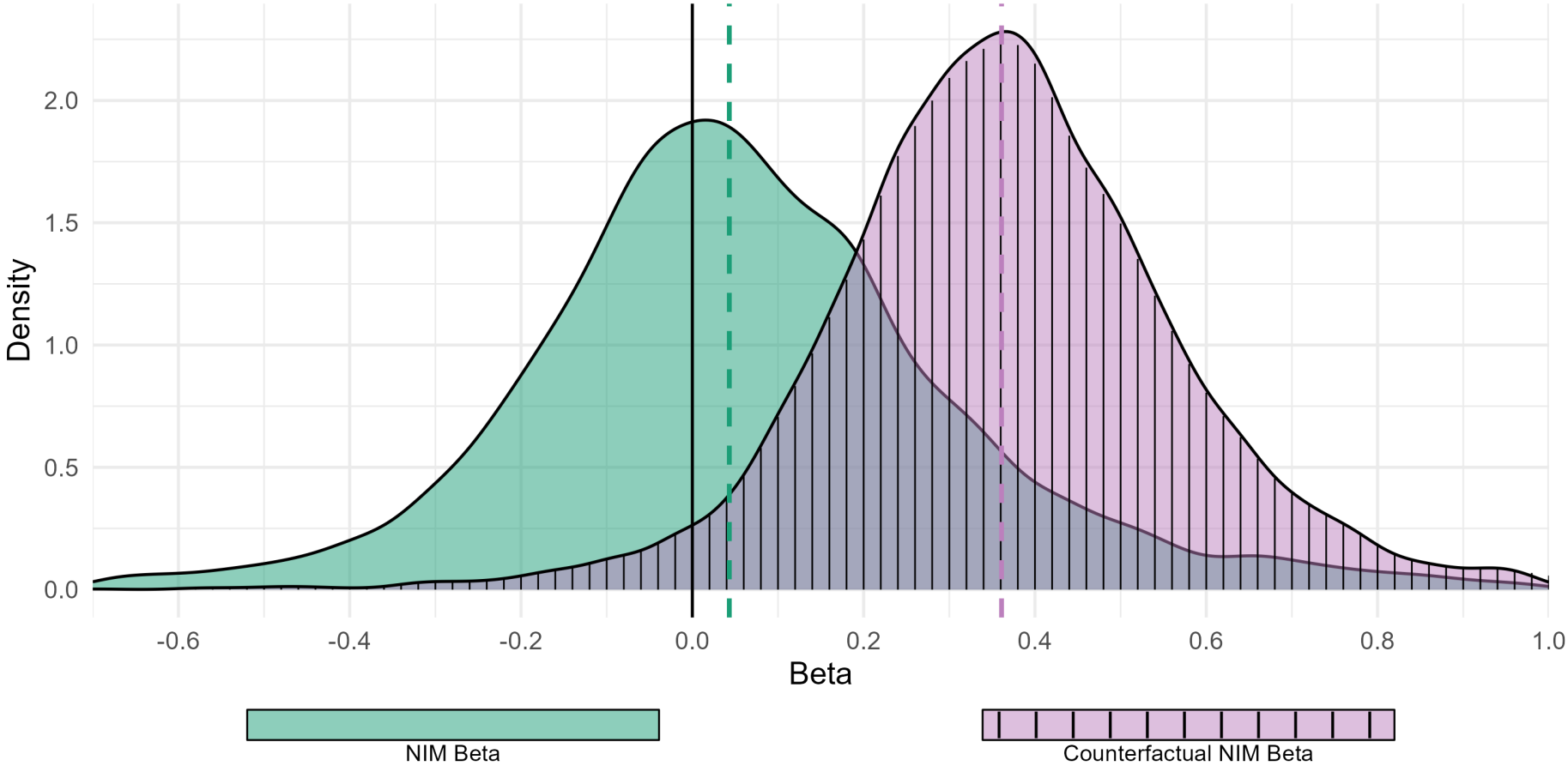
Distribution of Bank-Level NIM Sensitivities
Bad Financial Conditions



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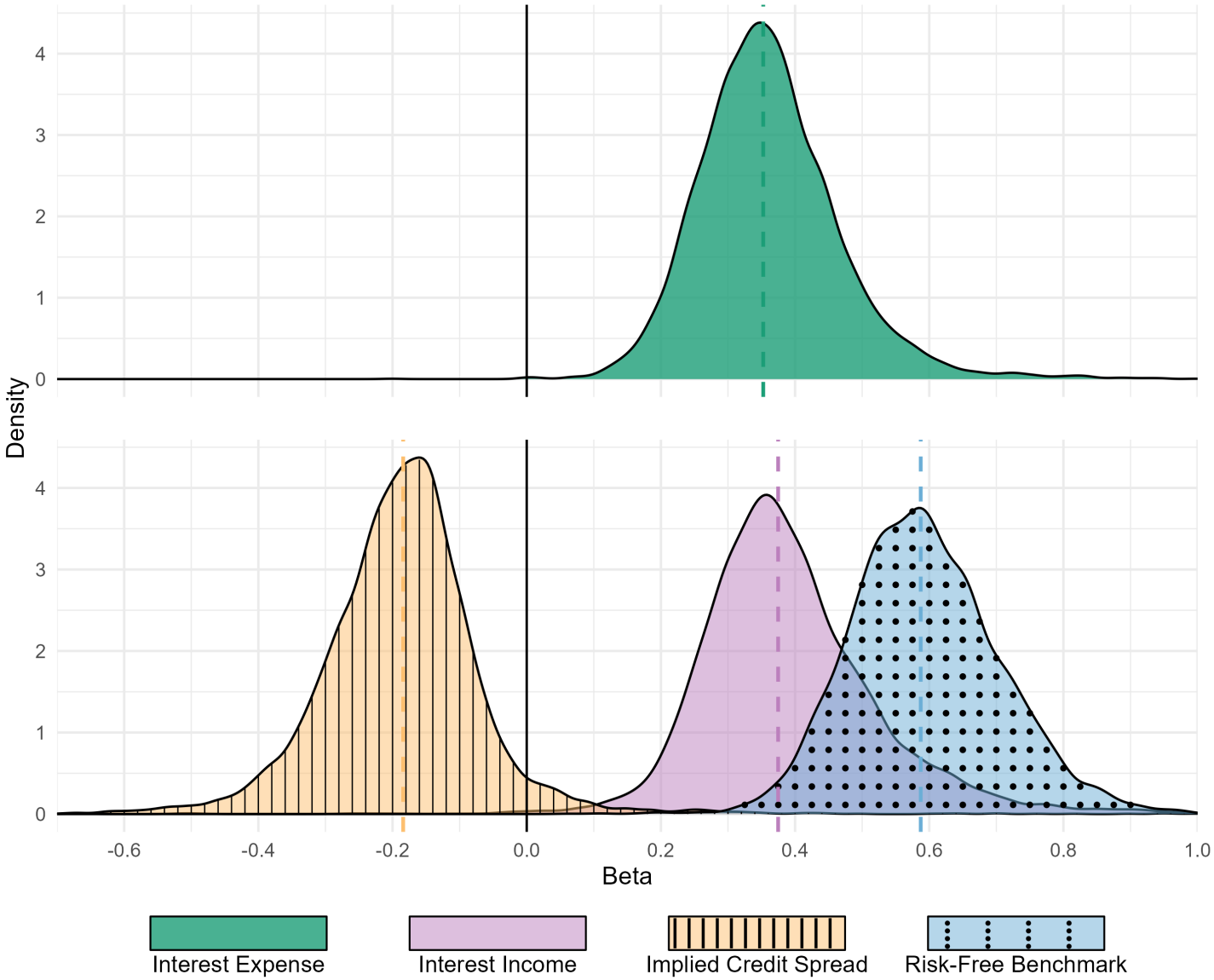
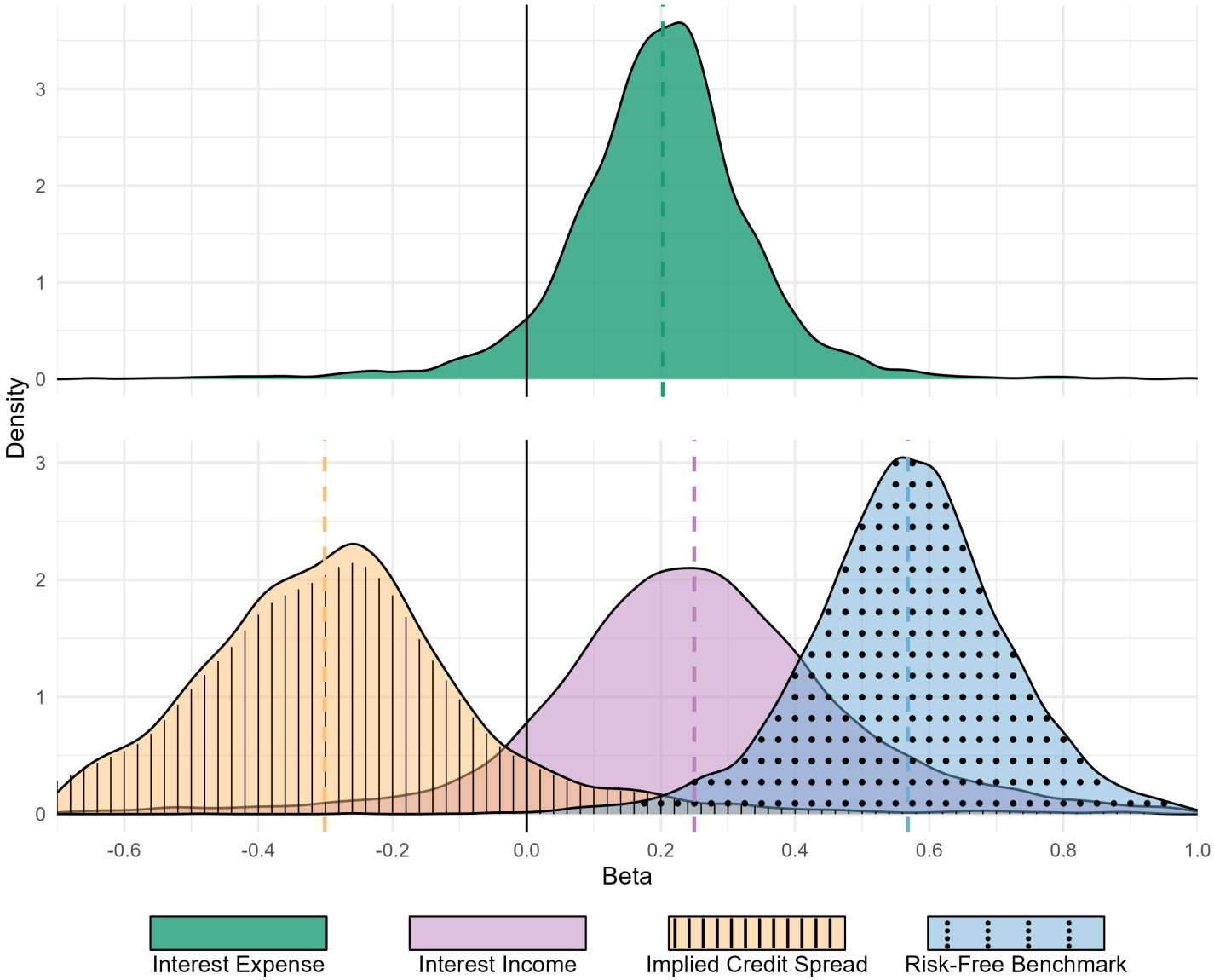
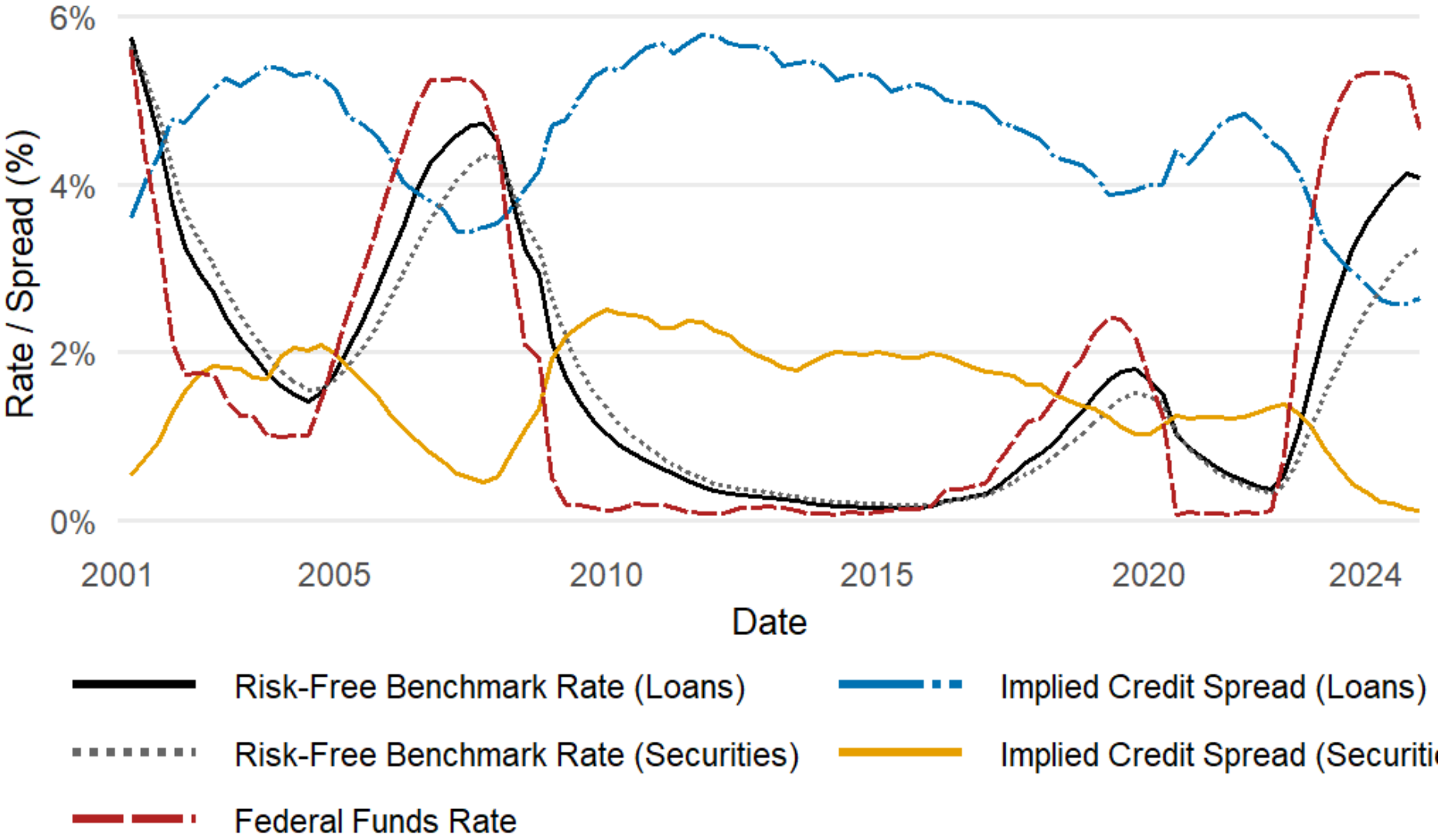
Distribution of Bank-Level Sensitivities
Good Financial Conditions



Distribution of Bank-Level Sensitivities
Bad Financial Conditions



Loan- and Security-Level Sensitivities



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Summary Statistics of Loan- and Security-Level Sensitivities

	Mean	SD	% Sig.	% Sig.+	% Sig.−	$\overline{R}^2$
Loans						
Interest income	**0.331**	0.175	89%	91%	0%	0.243
Risk-free benchmark	**0.699**	0.102	100%	100%	0%	0.907
Credit spread	**−0.368**	0.152	94%	0%	96%	0.260
Securities						
Interest income	**0.194**	0.288	38%	48%	0%	0.131
Risk-free benchmark	**0.556**	0.146	100%	100%	0%	0.647
Credit spread	**−0.364**	0.298	80%	0%	86%	0.182

Note. Quarterly data for U.S. commercial banks, 2001–2024.
Total banks: 6,150. Total observations: 495,439.

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Summary Statistics Largest 10% of Banks

	Mean	SD	% Sig.	% Sig.+	% Sig.−	$\overline{R}^2$
Net interest margin (NIM)	**0.027**	0.124	24%	21%	11%	0.131
Interest expense	**0.369**	0.099	98%	99%	0%	0.661
Interest income	**0.396**	0.134	96%	97%	0%	0.426
Risk-free benchmark	**0.582**	0.108	100%	100%	0%	0.896
Credit spread	**−0.185**	0.114	81%	1%	85%	0.213
Counterfactual NIM	**0.212**	0.117	84%	88%	1%	0.399

Note. Quarterly data for U.S. commercial banks, 2001–2024.
Total banks: 6,150. Total observations: 495,439.

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Summary Statistics Largest 5% of Banks

	Mean	SD	% Sig.	% Sig.+	% Sig.−	$\overline{R}^2$
Net interest margin (NIM)	**0.030**	0.139	19%	19%	10%	0.137
Interest expense	**0.388**	0.107	98%	100%	0%	0.663
Interest income	**0.418**	0.146	95%	96%	0%	0.445
Risk-free benchmark	**0.576**	0.109	100%	100%	0%	0.895
Credit spread	**−0.156**	0.124	74%	1%	79%	0.203
Counterfactual NIM	**0.186**	0.119	81%	85%	2%	0.374

Note. Quarterly data for U.S. commercial banks, 2001–2024.
Total banks: 6,150. Total observations: 495,439.

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Summary Statistics Alternative Algos

	Mean	SD	% Sig.	% Sig.+	% Sig.−	$\overline{R}^2$
Risk-free benchmark sensitivity						
Geometric amortization	**0.575**	0.113	100%	100%	0%	NA
No loan amortization	**0.490**	0.117	100%	100%	0%	NA
No exponential weights	**0.577**	0.115	100%	100%	0%	NA
Credit spread sensitivity						
Geometric amortization	**−0.234**	0.128	86%	0%	85%	NA
No loan amortization	**−0.149**	0.123	61%	0%	60%	NA
No exponential weights	**−0.237**	0.129	86%	0%	86%	NA

Note. Quarterly data for U.S. commercial banks, 2001–2024.
Total banks: 6,150. Total observations: 495,439.

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Summary Statistics 1997-2024

	Mean	SD	% Sig.	% Sig.+	% Sig.−	$\overline{R}^2$
Net interest margin (NIM)	**0.036**	0.141	26%	23%	10%	0.111
Interest expense	**0.322**	0.089	99%	99%	0%	0.575
Interest income	**0.358**	0.143	96%	97%	0%	0.300
Risk-free benchmark	**0.584**	0.112	100%	100%	0%	0.867
Credit spread	**−0.237**	0.129	84%	0%	88%	0.161
Counterfactual NIM	**0.273**	0.122	90%	93%	0%	0.292

Note. Quarterly data for U.S. commercial banks, 2001–2024.
Total banks: 6,150. Total observations: 495,439.

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Summary Statistics Top-Tier BHC and Commercial Banks

	Mean	SD	% Sig.	% Sig.+	% Sig.−	$\overline{R}^2$
Net interest margin (NIM)	**0.050**	0.134	27%	26%	8%	0.131
Interest expense	**0.311**	0.098	97%	98%	0%	0.595
Interest income	**0.361**	0.144	95%	96%	0%	0.340
Risk-free benchmark	**0.573**	0.118	100%	100%	0%	0.878
Credit spread	**−0.221**	0.131	83%	1%	86%	0.201
Counterfactual NIM	**0.271**	0.130	90%	92%	0%	0.399

Note. Quarterly data for U.S. commercial banks, 2001–2024.
Total banks: 6,150. Total observations: 495,439.

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Summary Statistics Alternative Constructions

	Mean	SD	% Sig.	% Sig.+	% Sig.−	$\overline{R}^2$
Risk-free benchmark sensitivity						
Baseline (λ_{t-1})	**0.579**	0.113	100%	100%	0%	0.875
Robust (λ_t)	**0.579**	0.106	100%	100%	0%	0.874
Algorithm	**0.637**	0.094	100%	100%	0%	0.898
Credit spread sensitivity						
Baseline (λ_{t-1})	**−0.238**	0.128	86%	0%	90%	0.179
Robust (λ_t)	**−0.238**	0.126	87%	0%	90%	0.180
Algorithm	**−0.296**	0.122	93%	0%	95%	0.217

Note. Quarterly data for U.S. commercial banks, 2001–2024.
Total banks: 6,150. Total observations: 495,439.

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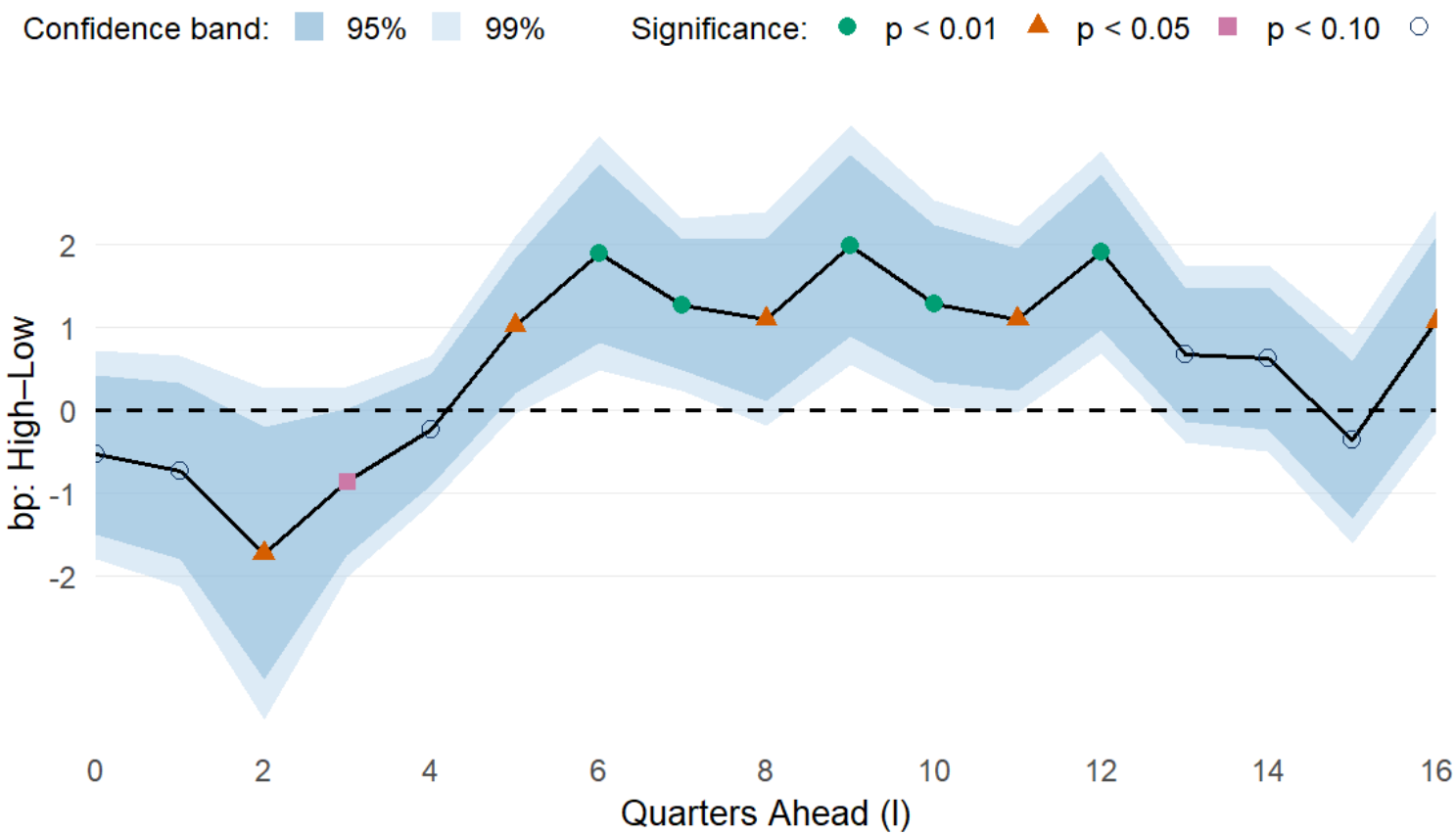
Higher CS Credit Spreads Predict Increase in NP Ratio

$$\Delta \log\left(1 + \mathrm{NP}_{i,t+\ell}^{(L+S)}\right) = \gamma_i + \psi_t + \beta_\ell H_{i,t} + u_{i,t+\ell},$$

$$H_{i,t} = 1 \text{ if } z\widehat{R}_{i,t} \geq Q_{0.75}(z\widehat{R}_{\cdot,t}),\ H_{i,t} = 0 \text{ if } z\widehat{R}_{i,t} \leq Q_{0.25}(z\widehat{R}_{\cdot,t})$$



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Interest Expense Side

- Funding composition:
  - fraction δ of deposits obtained at rate r_t^d
  - fraction γ of wholesale funding obtained at rate f_t
  - fraction $(1 - \delta - \gamma)$ of equity

  $\delta, \gamma \geq 0$ and $\delta + \gamma \leq 1$
- Interest expense rate:

$$r_t^{\text{exp}} = \delta_t r_t^d + \gamma_t f_t$$

- Interest expense rate sensitivity to changes in the fed funds rate:

$$\frac{\Delta r_t^{\text{exp}}}{\Delta f_t} = \delta \frac{\Delta r_t^d}{\Delta f_t} + \gamma$$

Interest Expense Rate Sensitivity

- Sticky deposit rates:

$$\frac{\Delta r_t^d}{\Delta f_t} < 1$$

- Positive equity:

$$\delta + \gamma < 1$$

- Implication for the interest expense rate sensitivity:

$$\frac{\Delta r_t^{\text{exp}}}{\Delta f_t} < 1$$

$\rightarrow$ Interest expenses do not reprice one-to-to one with changes in the fed funds rate.