Banks and the State-Dependent Effects of Monetary Policy

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Summary

- Documents state dependence in the effects of monetary policy shocks:
  - Bank net interest margins (NIM) respond differently in low- and high-rate states.
  - GDP, consumption, investment, and the stock market also respond differently.

- Connects this state dependence to the deposit channel of monetary policy.

- Builds and estimates:
  - A partial-equilibrium banking model with depositor attention.
  - A general-equilibrium New Keynesian model with high-MPC households.

Empirical design

- Method: local projections with interactions between the monetary policy shock and the rate-state indicator.
- Data:
  - Bank Call Reports, aggregated nationally; quarterly sample 1985Q1-2019Q4; FRED macro and financial variables.
- State variable:
  - High-rate state if the average federal funds rate over the prior six quarters is above 4 percent.
- Policy shock:
  - Benchmark recursive monetary policy shock.
  - Robustness uses Bauer-Swanson and Jarocinski-Karadi high-frequency shock measures.

Main Empirical Results

- After a 100 bp contractionary monetary policy shock:
  - Low-rate state: core NIM rises significantly and persistently.
  - High-rate state: core NIM falls significantly and persistently.
  - The difference across states is statistically significant.

- What drives the results?
  - Loan rates rise after a contractionary shock, but show little state dependence. The state dependence comes mainly from the liability side of banks' balance sheets.
  - Two deposit-side margins matter: Interest rates on savings and time deposits respond more when initial rates are high. Depositors shift from savings deposits to time deposits after rate hikes.

Macroeconomic evidence

- Real GDP falls after a contractionary monetary policy shock. The decline is substantially larger when the shock occurs after a low-rate period.
- The stock market, consumption, and investment show similar state dependence.
- The price-level response is weak in both states.
- The macro pattern mirrors the NIM pattern: low-rate states feature stronger contractionary effects.

Partial-Equilibrium Banking Model

- Households differ in attention to deposit rates: Attentive depositors receive higher deposit rates; Inattentive depositors are more profitable for banks.
- Banks compete for deposits subject to customer acquisition costs.
- Social interactions make attention state-dependent: Inattentive depositors can become attentive after meeting attentive depositors; This conversion is more likely when policy rates are high.

- Intuition: Three forces determine the NIM response to a policy-rate increase:
  - Present-value effect: higher rates reduce the value of future profits, so current spreads tend to rise.
  - Attention effect: higher rates increase pass-through to depositors, so spreads tend to fall.
  - Future-profit effect: expected future attention lowers future profits, so current spreads tend to rise.
- Low-rate state: present-value and future-profit effects dominate, so NIM rises. High-rate state: attention/pass-through effect dominates, so NIM falls.

From NIM to aggregate demand

- The general-equilibrium model adds high-MPC hand-to-mouth households.
- Bank profits accrue to lower-MPC households, while deposit interest income reaches higher-MPC households.
- In high-rate states, a policy hike passes through more to deposit rates.
- This raises liquid income for high-MPC households and dampens the fall in aggregate demand.
- The estimated GE model matches the state dependence in NIM and GDP reasonably well.

What I Find Persuasive

- The NIM sign reversal is a sharp and memorable empirical fact.
- The component evidence points to the deposit side rather than the loan side.
- The model mechanism is tightly linked to the empirical facts.
- Robustness checks cover:
  - Pre-crisis sample.
  - Alternative monetary policy shocks.
  - ZLB controls.
  - Alternative thresholds of 3.5 and 4.5 percent.
- The back-of-the-envelope aggregate-demand magnitudes are close to the observed GDP differences.

Comment 1: what does the rate state capture?

- The high-rate dummy may capture more than depositor attention. Possible confounds:
  - Inflation salience and macro uncertainty.
  - Business-cycle phase and credit demand.
  - Bank competition for deposits.
  - Deposit composition and money-market-fund substitution.

- The paper controls for several alternatives, but the state variable still deserves more direct validation. The main identification question is whether the six-quarter FFR state is a clean proxy for depositor attention.
- Empirically, can you test the attention effect as stated?

Comment 2: can attention be observed directly?

- The model relies on a social-attention mechanism.

- But the evidence is mostly indirect:
  - NIM responds differently across states.
  - Deposit rates and quantities move in the right direction.

- What would strengthen the mechanism?
  - Households check deposit rates more often when rates are high.
  - High-rate attention predicts switching into higher-yield deposits.
  - Responses vary by age, wealth, digital banking use, or peer networks.

Suggestion 1: Consider branch-level data

- Macro data is insufficient in identifying the relationship:
  - How to identify (in)attentive depositors (Egan et al. 2025)? How to control for demand and/or supply?
  - Are some banks more responsive than others (e.g., market power in Dreschsler et al. 2017) due to exploitation of inattentiveness? High vs. low betas.
  - Is frictions such as sleepiness, switching costs or search costs part of the story?

Analysis: Account Turnover

	(1)	(2)	(3)	(4)
Internet Banking	-0.007**	-0.028***	-0.043***	-0.052***
	(0.003)	(0.003)	(0.003)	(0.003)
Business Account	0.064***	0.042***	0.035***	0.041***
	(0.007)	(0.007)	(0.007)	(0.006)
Trust Account	0.055***	0.022***	0.014**	0.013**
	(0.006)	(0.006)	(0.006)	(0.005)
Over 65	-0.040***	-0.048***	-0.048***	-0.048***
	(0.003)	(0.003)	(0.002)	(0.002)
Large Initial Balance (50k+)	0.094***	0.086***	0.074***	0.072***
	(0.006)	(0.006)	(0.005)	(0.005)
ln(Bank Size (# Accounts))	0.006***	-0.004***	0.036***	
	(0.001)	(0.001)	(0.007)	
Savings Account	0.014***	0.010***	0.015***	0.013***
	(0.003)	(0.003)	(0.003)	(0.002)
Time Deposit Account	0.056***	0.053***	0.053***	0.051***
	(0.004)	(0.004)	(0.003)	(0.003)
Observations	55,041	55,041	55,041	55,022
R-squared	0.133	0.281	0.431	0.616
Year FE		X	X	
Bank FE			X	
Bank-Year FE				X

Model: Setup

Depositors

- Each period, depositors are either active ("awake") or inactive ("asleep"), based on idiosyncratic and aggregate factors
- Active depositors choose the bank that maximizes their indirect utility via discrete choice

Banks

- Compete dynamically for deposits
  - Face a trade-off between investing in new customers vs. harvesting existing ones
  - Marginal costs and markups are time-varying
- Invest collected deposits in risk-free securities

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Suggestion 2: use deposit-beta exposure

- Prediction: monetary tightening should be less contractionary where deposit pass-through is high.
- Possible implementation:
  - Estimate bank-level IntExp and IntInc betas before the shock (Drechsler et al., 2021).
  - Estimate bank-level deposit betas before the shock by age, income, etc
  - Map banks to local deposit or borrower markets.
  - Test whether high-beta areas have smaller output or employment declines.

This would connect the aggregate mechanism to bank-market heterogeneity.

Drechsler et al., 2021

Empirical Analysis

1. Call reports, all U.S. commercial banks, 1984 to 2013
   - we've posted cleaned data on our websites

2. For each bank i, estimate interest expense and income betas

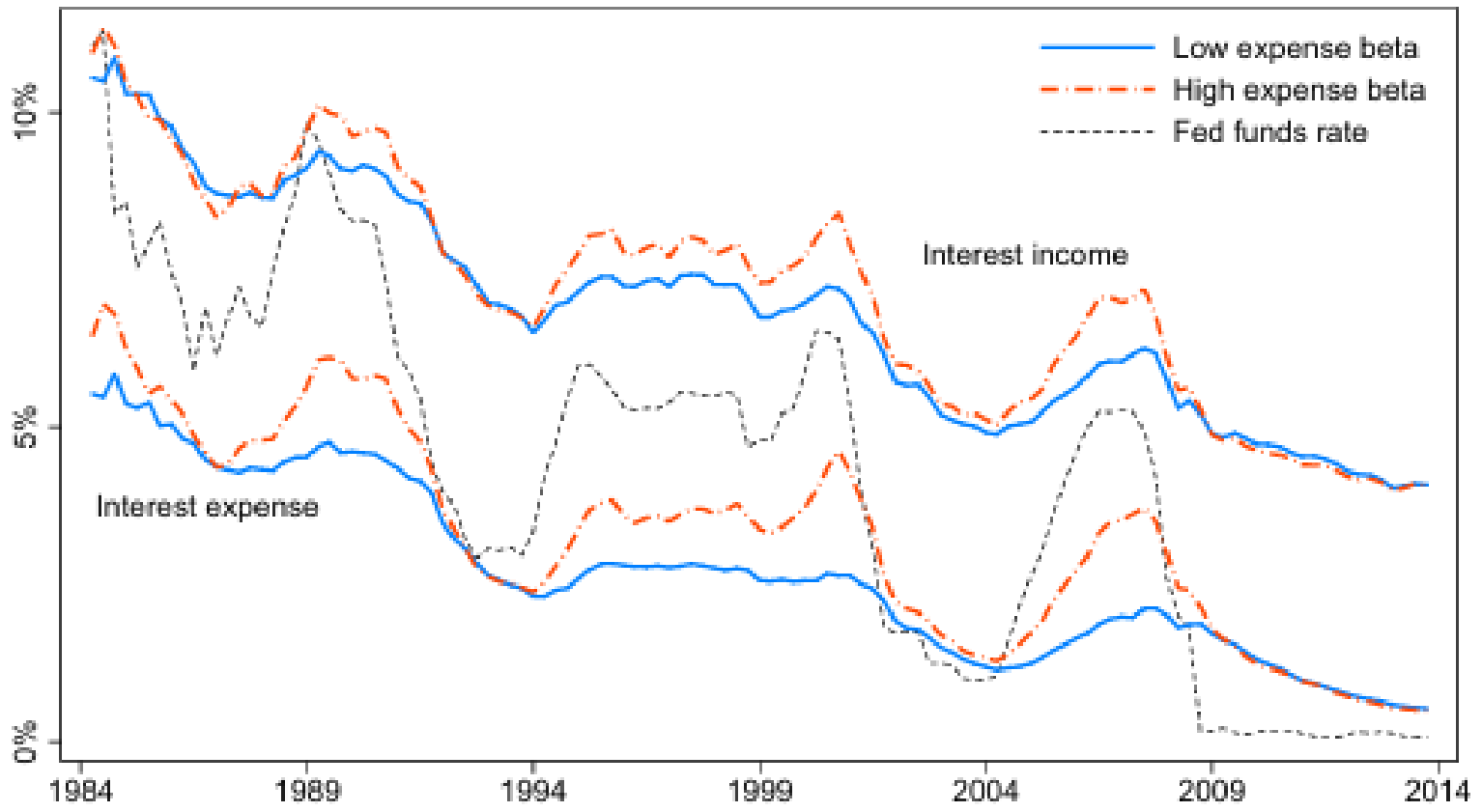
$$\Delta IntExp_{i,t} = \alpha_i + \sum_{\tau=0}^{3} \beta_{i,\tau}^{Exp} \Delta FF_{t-\tau} + \varepsilon_{it}$$

$$\Delta IntInc_{i,t} = \alpha_i + \sum_{\tau=0}^{3} \beta_{i,\tau}^{Inc} \Delta FF_{t-\tau} + \varepsilon_{it}$$

   - $IntExp$ = Interest expense/Assets
   - $IntInc$ = Interest income/Assets
   - 4 quarterly lags of ΔFF capture adjustment over a full year

3. Plot $\beta_i^{Exp} = \sum_{\tau=0}^{3} \beta_{i,\tau}^{Exp}$ versus $\beta_i^{Inc} = \sum_{\tau=0}^{3} \beta_{i,\tau}^{Inc}$

Drechsler et al., 2021



1 Average interest income and interest expense rate by expense beta (top vs. bottom 5%)

- a non-parametric way to see matching in the cross section

Suggestion 3: sharpen the outside-option channel

- Depositor attention may respond to outside yields, not only the policy rate.

- Useful variation:
  - Money market fund yields and local brokerage access.
  - Online bank penetration and digital switching costs.
  - Share of uninsured or large deposits.

- Stronger outside options should amplify pass-through and NIM compression.

Suggestion 4: study the 2022-2025 tightening cycle

- The recent tightening cycle is a natural stress test.

- Why it matters:
  - Rates rose quickly from near zero to high levels.
  - Money market funds and online banks were highly salient.
  - Deposit outflows and bank funding pressure became central issues.

- Question: does the same NIM/GDP state dependence appear in this newer environment?

Lastly

- Connect to the literature on the behavioral side of MP (e.g., Berger et al., 2020).

- Connect to recent literature on dynamic deposits (e.g., Egan et al. 2025; Drechsler et al. forthcoming)