Bank Concentration and Monetary Policy Pass-Through

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Motivation

- **Rise in U.S. bank concentration**
  - Average local Herfindahl-Hirschman Index (HHI) increased from 15% to 26% between 1994 and 2019
  - Asset share of giant banks increased from 10% to 60% during the same time
- **Research question:** How does the rise in bank concentration alter monetary transmission?
  - Market power channel
  - Capital allocation channel
- **Matters for:** Effectiveness of monetary policy, financial stability, distributional effects

The Paper in a Nutshell

1. Uses granular deposit and loan rate data from RateWatch to quantify
   - Cross-sectional pass-through of monetary shocks to loan rates
   - Contribution of local bank concentration and capitalization
2. Uses theoretical model to rationalize empirical findings
   - Accounts for differences across banks and branches
   - Explicit modeling of bank market power and capital ratios
3. Uses quantitative model to assess macroeconomic impact
   - Embeds theoretical model into New Keynesian model
   - Quantifies change in transmission due to rising bank concentration

Rate Dispersion and Spreads

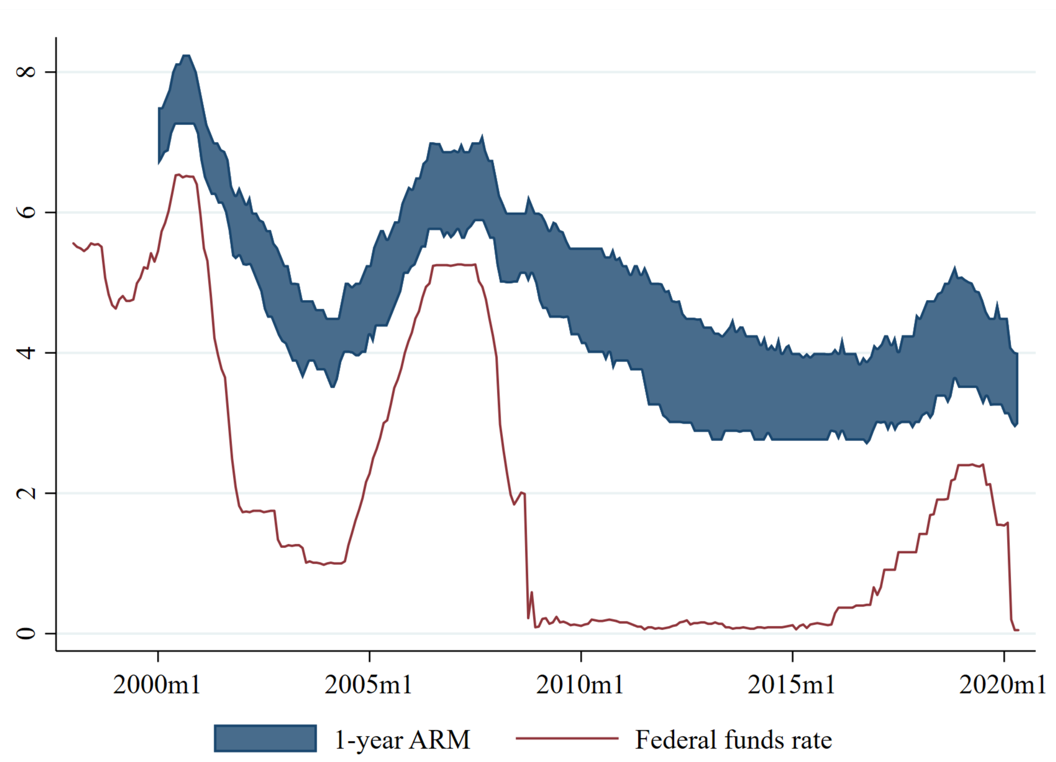

Figure: IQR of 1-year hybrid ARM across surveyed branches and federal funds rate

- Average IQR across *banks* in the same market: 1.03 p.p.
- Average IQR across *branches* of the same bank: 0.32 p.p.
- Dispersion and spreads higher in times of low rates

Empirical Model

Local projections:

$$r_{t+h,i,c} - r_{t-1,i,c} = {}^{h}_{i} + {}^{h}s_t + \underbrace{{}^{h}s_t \times \mathbf{X_{t,i,c}}}_{\text{local HHI or bank capitalization}} + \theta^h \mathbf{X_{t,i,c}} + \eta^h Z_{t,c} + \epsilon_{t+h,i,c}$$

- $\mathbf{X_{t,i,c}}$ county-level HHI, bank capital to assets ratio
- s_t monetary surprise (Nakamura and Steinsson, 2018)
- $Z_{t,c}$ controls for national and local economic conditions
- Pass-through: ${}^{h} + {}^{h}(\bar{m}^X \pm 2sd^X)$

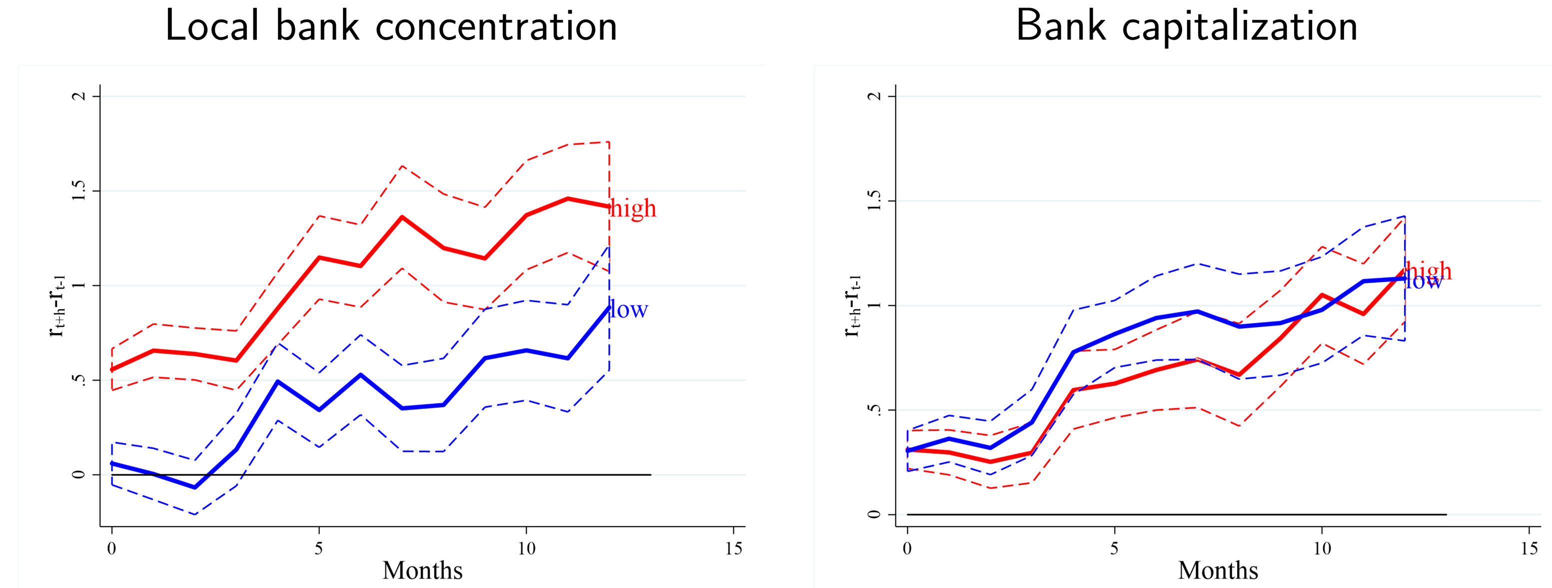

Figure: Loan rate responses to a monetary shock for high/low state

Pass-through of a 100 b.p. policy rate increase to loan rates

- 50 b.p. higher for branches in high vs. low concentration markets
- 25 b.p. higher for banks with low vs. high capital ratios

Theoretical Model

$$\max \Pi_i^c = r_i^{l,c} L_i^c(r_i^{l,c}) + r^f R_i^c - r_i^d D_i^c(r_i^{d,c})$$

s.t.

1. Bank capital requirement: $K_i^{b,c} \geq \overbrace{\nu_i^b}^{\text{bank-specific}} L_i^c,$
2. Local loan demand: $L_i^c = f(r_i^{l,c}, \overbrace{\epsilon^{l,c}}^{\text{location-specific}}, \bar{r}^{l,c}, \bar{L}^c)$
3. Local deposit supply: $D_i^c = f(r_i^{d,c}, \epsilon^{d,c}, \bar{r}^{d,c}, \bar{D}^d)$
4. Balance sheet constraint: $L_i^c + R_i^c = D_i^c + K_i^{b,c}$

$$\frac{dr_i^{l,c}}{dr^f} = \underbrace{\frac{\epsilon^{l,c}}{(\epsilon^{l,c}-1)}}_{\textit{market power channel}} + \underbrace{\frac{\epsilon^{l,c}}{(\epsilon^{l,c}-1)} \nu_i^b \frac{d\phi_i}{dr^f}}_{\textit{capital allocation channel}}$$

- Pass-through varies across banks due to differences in ν_i^b
- Pass-through varies across locations due to differences in $\epsilon^{l,c}$

Quantitative Model

Credit and Banking New Keynesian Model (Gerali et al., 2010) + heterogeneity in banking sector along two dimensions:

1. Different demand elasticities in local markets
2. Size-dependent bank capital requirements

Bank types

Local market concentration		Regional	Giant	Share
	Low	$r_t^{l,r} = \frac{\epsilon^l}{\epsilon^l-1} R_t^r$	$r_t^{l,g} = \frac{\epsilon^l}{\epsilon^l-1} R_t^g$	^{m}
	High	$r_t^{h,r} = \frac{\epsilon^h}{\epsilon^h-1} R_t^r$	$r_t^{h,g} = \frac{\epsilon^h}{\epsilon^h-1} R_t^g$	$(1 - {}^{m})$
	Share	^{b}	$(1 - {}^{b})$	

- $\epsilon^{h,l}$ calibrated to markups in high/low-concentration markets
- $R_t^{r,g}$ depends on ν^b, calibrated to capital ratio by bank size

Counterfactual: Rise in Bank Concentration

- Amplifies pass-through to loan rates and transmission to lending
- Amplifies transmission to output; dampens effect on inflation
- Leads to a flattening of the Phillips curve

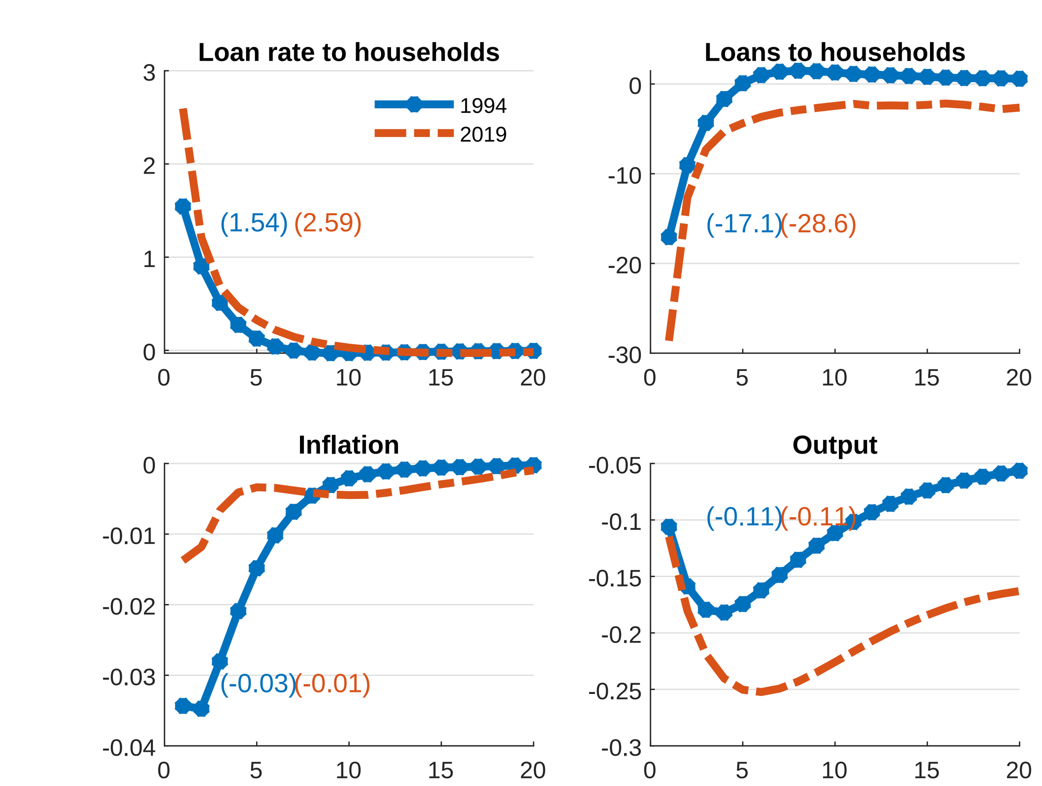

Figure: Impulse responses to a monetary shock in 1994 vs. 2019

- Quantify change in transmission due to rising bank concentration
- Calibration of banking sector to 1994 vs. 2019, accounting for:
  - Decrease in share of low-concentration markets (^{m}) and regional banks (^{b})
  - Increase in markups (ϵ) and bank capital ratios (ν^b) over time

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