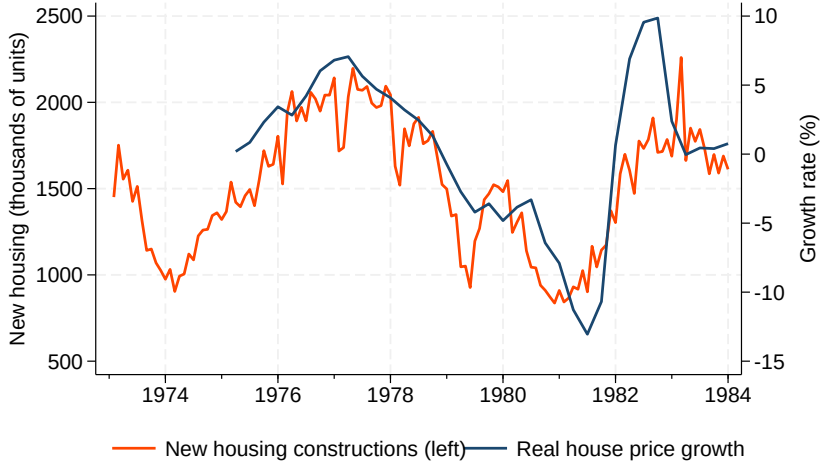
Credit Crunch in Housing under Regulation Q

Federal Reserve Financial and Monetary History Conference

Pauline Liang

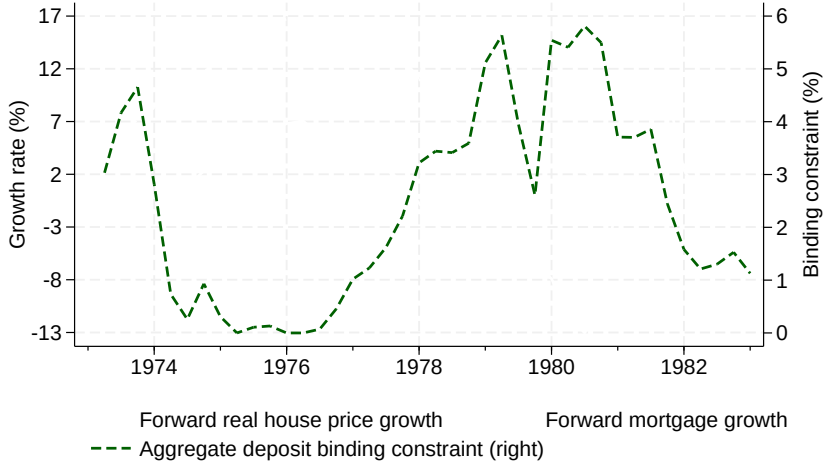
May 6, 2026

Boom-bust cycle in the housing market in the 1970s



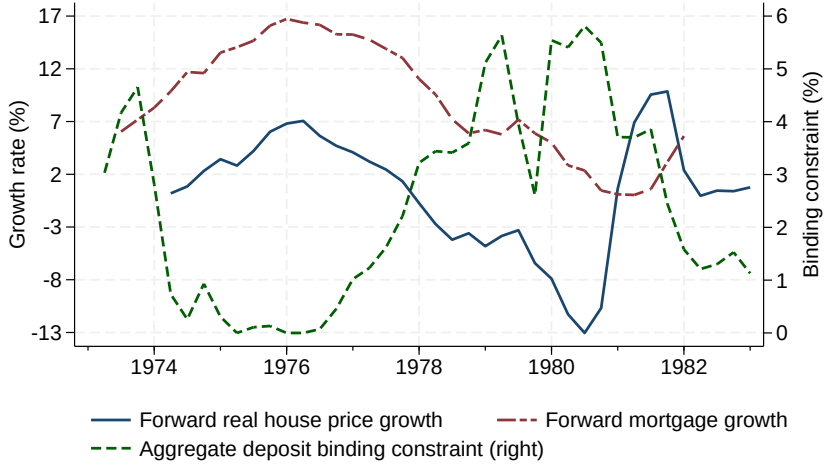
This paper: Credit crunch under Regulation Q played an important role

Deposit ceiling tightness and housing market



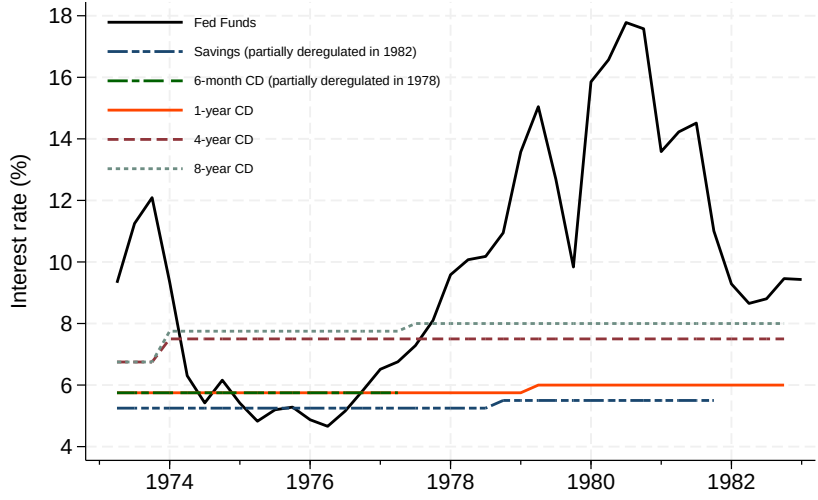
- Regulation Q imposed ceiling rates that institutions paid on deposits

Deposit ceiling tightness and housing market



- Tighter ceilings $\Rightarrow$ deposits $\downarrow$ $\Rightarrow$ credit provision $\downarrow$ $\Rightarrow$ credit crunch

Cross section: deposit composition drives ceiling tightness



- Product ceilings vary ⇒ compositions face different effective ceilings

From deposit ceilings to housing market equilibrium

Step 1: Tighter effective ceilings ⇒ larger retail-deposit outflows

Step 2: Tighter effective ceilings ⇒ bigger mortgage credit crunch

- Pass-through differs: savings and loan associations (S&Ls) > banks
- S&Ls **lack flexibility** to replace lost retail deposits with exempt funds

Step 3: Areas with more S&Ls and tighter ceilings ⇒ larger housing impacts

- 1 pp tighter S&L ceiling ⇒ -4.7 pp mortgage growth rate, -1.1 pp real house-price growth rate over the next year
- Effects through banks are muted

From deposit ceilings to housing market equilibrium

Step 1: Tighter effective ceilings ⇒ larger retail-deposit outflows

Step 2: Tighter effective ceilings ⇒ bigger mortgage credit crunch

- Pass-through differs: savings and loan associations (S&Ls) > banks
- S&Ls **lack flexibility** to replace lost retail deposits with exempt funds

Step 3: Areas with more S&Ls and tighter ceilings ⇒ larger housing impacts

- 1 pp tighter S&L ceiling ⇒ -4.7 pp mortgage growth rate, -1.1 pp real house-price growth rate over the next year
- Effects through banks are muted

From deposit ceilings to housing market equilibrium

Step 1: Tighter effective ceilings $\Rightarrow$ larger retail-deposit outflows

Step 2: Tighter effective ceilings $\Rightarrow$ bigger mortgage credit crunch

- Pass-through differs: savings and loan associations (S&Ls) $>$ banks
- S&Ls **lack flexibility** to replace lost retail deposits with exempt funds

Step 3: Areas with more S&Ls and tighter ceilings $\Rightarrow$ larger housing impacts

- 1 pp tighter S&L ceiling $\Rightarrow -4.7$ pp mortgage growth rate, -1.1 pp real house-price growth rate over the next year
- Effects through banks are muted

Contributions and literature

Contribution # 1: A credit crunch mechanism using cross-sectional variation

- **Aggregate trend of housing market in 1970s: High interest rate** (Hendershott et al., 1980; Topel and Rosen, 1988; Piazzesi, 2025) **High inflation** (Kearl, 1979; Summers, 1980; Poterba, 1984; Leombroni et al., 2020; Brunnermeier and Julliard, 2008; Agarwal and Baron, 2024) **Demographic change** (Mankiw and Weil, 1989; Green and Hendershott, 1996; Ortalo-Magne and Rady, 2006)

Contribution # 2: Funding flexibility as driver of credit crunch and key determinant of the pass-through of the bank-lending channel

- **Effective bank lending channel** (Kashyap and Stein, 2000; Ivashina and Scharfstein, 2010; Jiménez et al., 2012; Amiti and Weinstein, 2018; Drechsler et al., 2017); **Attenuated bank lending channel** (Gatev and Strahan, 2006; Acharya and Mora, 2015; Cetorelli and Goldberg, 2012; Gilje et al., 2016)

Contributions and literature

Contribution # 1: A credit crunch mechanism using cross-sectional variation

- **Aggregate trend of housing market in 1970s: High interest rate** (Hendershott et al., 1980; Topel and Rosen, 1988; Piazzesi, 2025) **High inflation** (Kearl, 1979; Summers, 1980; Poterba, 1984; Leombroni et al., 2020; Brunnermeier and Julliard, 2008; Agarwal and Baron, 2024) **Demographic change** (Mankiw and Weil, 1989; Green and Hendershott, 1996; Ortalo-Magne and Rady, 2006)

Contribution # 2: Funding flexibility as driver of credit crunch and key determinant of the pass-through of the bank-lending channel

- **Effective bank lending channel** (Kashyap and Stein, 2000; Ivashina and Scharfstein, 2010; Jiménez et al., 2012; Amiti and Weinstein, 2018; Drechsler et al., 2017); **Attenuated bank lending channel** (Gatev and Strahan, 2006; Acharya and Mora, 2015; Cetorelli and Goldberg, 2012; Gilje et al., 2016)

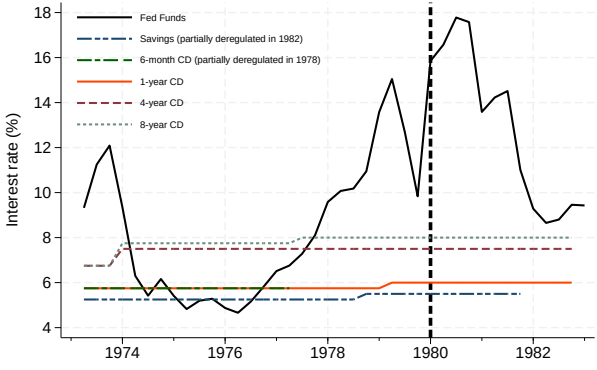
Table of Contents

Setting and Data

Regulation Q

- Product-specific ceiling rates on deposits, enacted in 1933
- Ceilings were not binding until mid-1960s when interest rate rose
- Gradual phase-out of ceiling rates started in 1970
  - 1973: Wholesale deposits fully exempt
  - 1983: Ceilings on all time deposits eliminated
  - 1986: Ceilings on savings deposits eliminated
  - 2010: Ceiling on demand deposits eliminated through Dodd–Frank

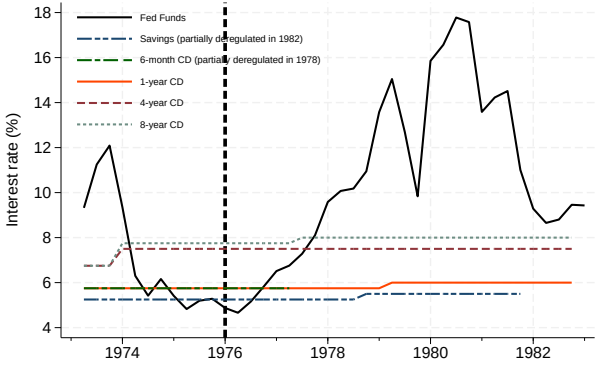
Deposit rate ceilings under Regulation Q



Share of S&Ls paying ceiling rate

	1976	1980
Small time 4y	73%	98%
Small time 1y	80%	94%
Savings	95%	98%

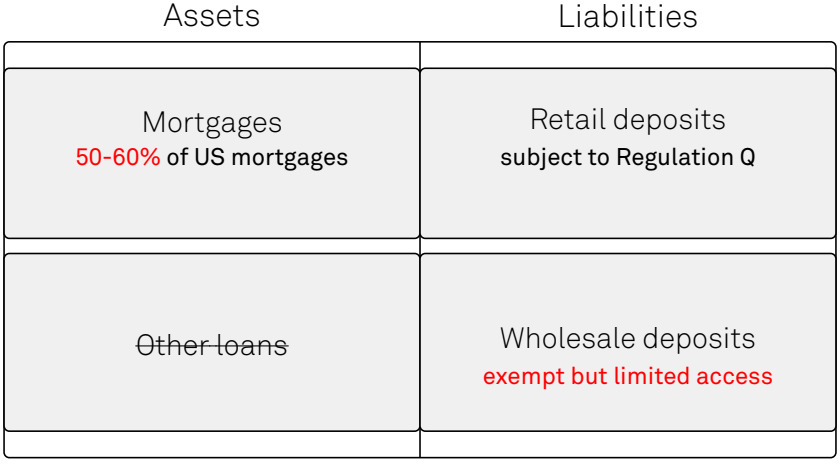
Deposit rate ceilings under Regulation Q



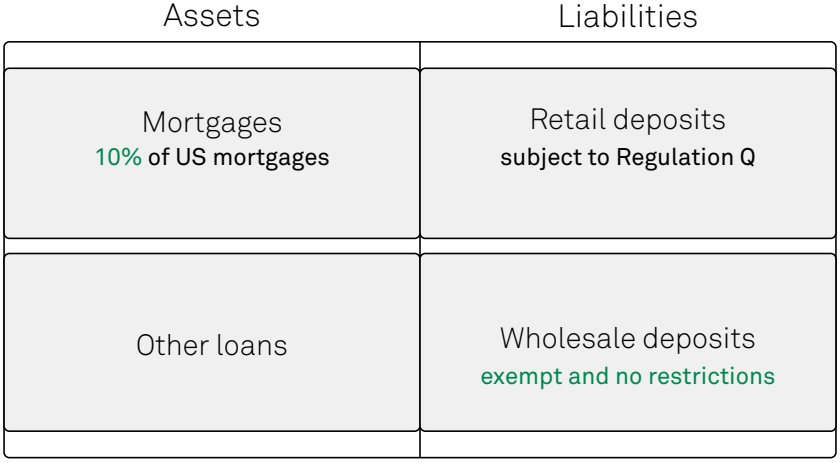
Share of S&Ls paying ceiling rate

	1976	1980
Small time 4y	73%	98%
Small time 1y	80%	94%
Savings	95%	98%

S&Ls under Regulation Q



Banks under Regulation Q



Funding flexibility: Access to wholesale deposits

- Wholesale deposits: time deposits with denomination $\geq 100,000$
- Primarily from the national market
  - Jumbo negotiable CDs sold to investors
  - Brokered CDs
- Banks: no restrictions, broad investor network
- S&Ls: thin investor network and regulatory caps on issuance
  - Allowed in 1974, issuance cap of 5–10% of deposits
- **Funding flexibility $\Longrightarrow$ Different effects between banks and S&Ls**

Wholesale share

Data

- Sample period
  - Starts in 1975Q1, beginning of housing data
  - Ends in 1983Q3, when all time-deposit ceilings were removed
- Financial data Summary statistics
  - S&L Financial Reports, available through National Archives
  - Bank Call Reports, available through WRDS
- Housing data at CBSA level Summary statistics
  - Freddie Mac Housing Price Index (FMHPI)
  - Median house price from 1980 Census; build the series using FMHPI

Measuring Funding Frictions from Deposit Ceilings

Measuring the funding frictions

- How much higher can institution *i* pay on deposits absent Regulation Q?
- Use a shift-share approach

$$\text{Bind}_{i,t} = \sum_j \mathbf{s_{ijt}}\, \mathbf{g_{jt}}$$

- The shift: spread between market rate and ceiling rate for deposit product *j*

$$\mathbf{g_{jt}} = \max\{0,\ \text{Maturity Matched Market Rate}_{tj} - \text{Ceiling}_{tj}\}$$

- The share: share of deposit product *j* at institution *i*

$$\mathbf{s_{ijt}} = \frac{\text{Deposits}_{ijt}}{\text{Total Deposits}_{it}}$$

- 1 pp ↑ in $\text{Bind}_{i,t}$ = 1 pp tightening in effective ceiling rate

Deposit products | Demand deposits | Summary statistics | Mismeasurement

Measuring the funding frictions

- How much higher can institution *i* pay on deposits absent Regulation Q?
- Use a shift-share approach

$$\text{Bind}_{i,t} = \sum_j \mathbf{s_{ijt}}\, \mathbf{g_{jt}}$$

- The shift: spread between market rate and ceiling rate for deposit product *j*

$$\mathbf{g_{jt}} = \max\{0,\ \text{Maturity Matched Market Rate}_{tj} - \text{Ceiling}_{tj}\}$$

- The share: share of deposit product *j* at institution *i*

$$\mathbf{s_{ijt}} = \frac{\text{Deposits}_{ijt}}{\text{Total Deposits}_{it}}$$

- 1 pp ↑ in $\text{Bind}_{i,t}$ = 1 pp tightening in effective ceiling rate

Deposit products | Demand deposits | Summary statistics | Mismeasurement

Measuring the funding frictions

- How much higher can institution *i* pay on deposits absent Regulation Q?
- Use a shift-share approach

$$\text{Bind}_{i,t} = \sum_j \mathbf{s_{ijt}}\, \mathbf{g_{jt}}$$

- The shift: spread between market rate and ceiling rate for deposit product *j*

$$\mathbf{g_{jt}} = \max\{0,\ \text{Maturity Matched Market Rate}_{tj} - \text{Ceiling}_{tj}\}$$

- The share: share of deposit product *j* at institution *i*

$$\mathbf{s_{ijt}} = \frac{\text{Deposits}_{ijt}}{\text{Total Deposits}_{it}}$$

- 1 pp ↑ in $\text{Bind}_{i,t}$ = 1 pp tightening in effective ceiling rate

Deposit products | Demand deposits | Summary statistics | Mismeasurement

Identification assumption

- Deposit composition is orthogonal to future shocks in deposits and lending
- Deposit composition is sticky, and reflects legacy factors (What explains the variations?)

What might break the identification?

- Anticipation of future shock (No pre-trend when ceiling first binds)
- Rapid reshuffling within quarter (Persistent mix, $R^2 = 0.93$)

Steps 1 & 2:
Deposit and Lending Response at Institutions

Effects of deposit-rate ceilings on deposits and lending

- How do deposit-rate ceilings affect funding allocation and mortgage credit?
- I run the following regression for S&Ls and banks separately

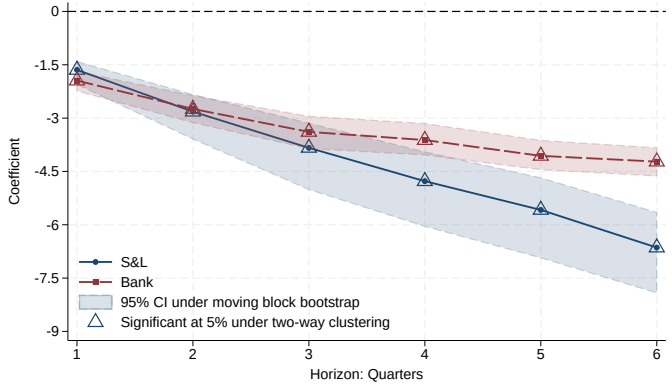
$$\Delta y_{i,t\to t+h} = \beta_h \, \mathrm{Bind}_{i,t} + \boldsymbol{\phi}_h^\top \mathbf{X}_{i,t} + \delta_{s(i),t} + \varepsilon_{i,t+h}$$

- Dependent variables: cumulative growth of balance sheet variable y from t to $t+h$ for institution i
- Controls $\mathbf{X}_{i,t}$: institution fundamentals and local market demographics
- $\delta_{s(i),t}$: state $\times$ time fixed effects

Step 1: Tighter effective ceilings $\Longrightarrow$ retail deposit outflows

- When effective ceiling tightens by 1 pp, retail deposit growth rate drops by

$$\Delta y_{i,t\to t+h} = \beta_h \, \text{Bind}_{i,t} + \boldsymbol{\phi}_h^\top \mathbf{X}_{i,t} + \delta_{s(i),t} + \varepsilon_{i,t+h}$$

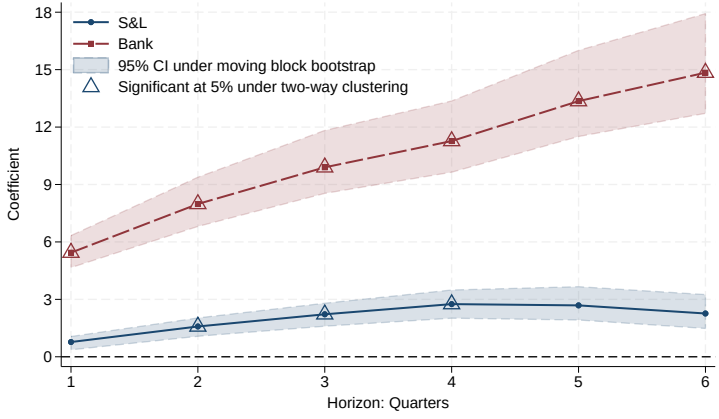


- Similar ↓ in retail deposits across institutions over the next year

Demand dep | Initial share control | No overlaps | Jorda (2005) | Event study 1977Q4

Banks substitute toward wholesale deposits

- When effective ceiling tightens by 1 pp, wholesale deposit growth moves by

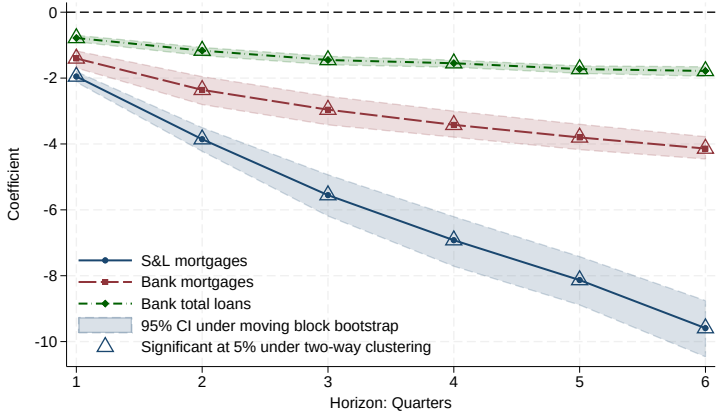


- Mechanism: **Funding flexibility** at banks, not S&Ls

Demand dep | Non-deposit alternative funds | Initial share control | No overlaps | Jorda (2005) | Event study 1977Q4

Step 2: Lending responses differ at banks and S&Ls

- When effective ceiling tightens by 1 pp, mortgage growth rate drops by



- 7.0 pp ↓ at S&Ls over the next year – banks ≈ half as large
- A mortgage credit crunch occurs, and it is stronger at S&Ls

Demand dep | No overlaps | Jorda (2005) | Event study 1977Q4

Step 3:
Local Housing Outcomes

Measuring funding frictions at local level

- S&L and bank funding frictions at CBSA c:

$$\text{S\&LFriction}_{c,t} \equiv \textit{share}^{\text{S\&L}}_{c,1974} \, \text{Bind}^{\text{S\&L}}_{c,t}$$

$$\text{BankFriction}_{c,t} \equiv \textit{share}^{\text{Bank}}_{c,1974} \, \text{Bind}^{\text{Bank}}_{c,t}$$

- Use initial deposit share in 1974 to capture historical S&L or bank reliance
- Aggregate deposits at the CBSA level to construct $\text{Bind}_{c,t}$

Local level summary statistics | Correlation between components | Geographic variation

How do deposit-rate ceilings affect housing outcomes?

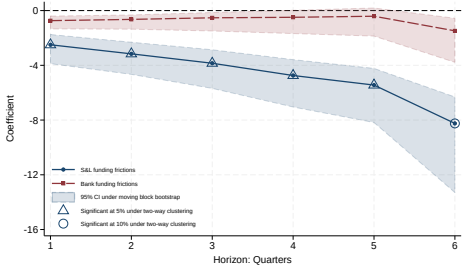
$$\Delta y_{c,t\to t+h} = \beta_{1,h}\,\text{S\&L Friction}_{c,t} + \beta_{2,h}\,\text{Bank Friction}_{c,t} + \boldsymbol{\phi}_h^{\top}\mathbf{X}_{c,t} + \delta_t + \varepsilon_{c,t+h}$$

- Dependent variable: cumulative change from t to $t+h$
  - Total mortgage credit in the local area
  - Real house prices
- Controls $\mathbf{X}_{c,t}$: CBSA demographics and lending-market characteristics

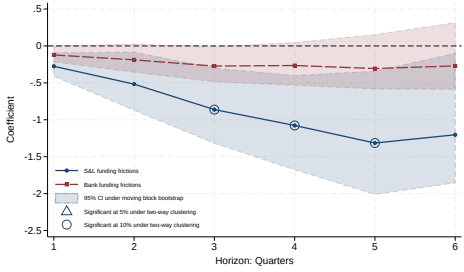
Step 3: Tighter S&L ceilings weaken local housing market

$$\Delta y_{c,t\to t+h} = \beta_{1,h}\,\text{S\&L Friction}_{c,t} + \beta_{2,h}\,\text{Bank Friction}_{c,t} + \boldsymbol{\phi}_h^{\top}\mathbf{X}_{c,t} + \delta_t + \varepsilon_{c,t+h}$$

Mortgage ($) growth rate



Real house price growth rate



- When effective S&L ceiling tightens by 1 pp, over the next year

  $\Longrightarrow$ Mortgage growth $\downarrow$ by 4.7 pp, real house price $\downarrow$ by 1.1 pp

- Effects through banks are muted

Demand deposits | No overlap | Jorda (2005) | Event study 1977Q4 | Substitution | Supply side | Alternative measure | Sorting exercise

Housing market equilibrium: What about quantities?

$$\Delta h_{c,1980\to1990} = \alpha + \beta_1 Z(\text{S\&LFriction})_c + \beta_2 Z(\text{BankFriction})_c + \boldsymbol{\phi}^\top \mathbf{X}_c + \varepsilon_c$$

	Δ Housing units per 1,000 persons (1980–1990)		
	(1)	(2)	(3)
S&L funding frictions 1975–1980	−9.466**	−11.019**	**−9.909****
	(4.458)	(4.478)	**(4.430)**
Bank funding frictions 1975–1980	−5.718	−6.454	**−3.421**
	(4.435)	(4.428)	**(4.431)**
Demographic controls	Yes	No	**Yes**
Lending market controls	No	Yes	**Yes**
Observations	884	884	**884**
R^2	0.02	0.01	**0.06**

- Joint decline in prices and housing quantities

$\Longrightarrow$ Net effect of downward shift in homebuyers' demand curve

Construction results | Supply side

Additional findings and robustness

Additional results

- What drives the impact? Ceiling tightness or reliance? Sorting
- Limited substitutions between banks and S&Ls Substitution
- Supply side effect Supply side
- Model to illustrate how funding frictions map into housing outcomes

Robustness

- Varying the treatment of demand deposits in $\text{Bind}_{i,t}$ Institution Local
- Jorda (2005) local projections Institution Local
- Overlapping observations: Keeping one start date per horizon Institution Local

Conclusion

Conclusion

A credit crunch channel for the 1970s boom-bust in the housing market

- Tighter ceilings $\Rightarrow$ deposits $\downarrow \Rightarrow$ mortgage credit $\downarrow \Rightarrow$ prices & quantities $\downarrow$
- Channel runs through S&Ls, which lack funding flexibility to replace retail with exempt wholesale funds

Implications

- Funding rules and flexibility still shape banks, shadow banks, and fintech (Begenau and Landvoigt, 2022; Buchak et al., 2018)
- Deposit-rate caps persist in some emerging markets (e.g., China) (Buchak et al., 2021)

Thank You

References I

Acharya, Viral V, and Nada Mora. 2015. "A crisis of banks as liquidity providers." *The journal of Finance*, 70(1): 1–43.

Agarwal, Isha, and Matthew Baron. 2024. "Inflation and disintermediation." *Journal of Financial Economics*, 160: 103902.

Amiti, Mary, and David E Weinstein. 2018. "How much do idiosyncratic bank shocks affect investment? Evidence from matched bank-firm loan data." *Journal of Political Economy*, 126(2): 525–587.

Begenau, Juliane, and Tim Landvoigt. 2022. "Financial regulation in a quantitative model of the modern banking system." *The Review of Economic Studies*, 89(4): 1748–1784.

Brunnermeier, Markus K, and Christian Julliard. 2008. "Money illusion and housing frenzies." *The Review of Financial Studies*, 21(1): 135–180.

References II

Buchak, Greg, Gregor Matvos, Tomasz Piskorski, and Amit Seru. 2018. "Fintech, regulatory arbitrage, and the rise of shadow banks." *Journal of financial economics*, 130(3): 453–483.

Buchak, Greg, Jiayin Hu, and Shang-Jin Wei. 2021. "FinTech as a financial liberator." National Bureau of Economic Research.

Cetorelli, Nicola, and Linda S Goldberg. 2012. "Banking globalization and monetary transmission." *The Journal of Finance*, 67(5): 1811–1843.

Drechsler, Itamar, Alexi Savov, and Philipp Schnabl. 2017. "The deposits channel of monetary policy." *The Quarterly Journal of Economics*, 132(4): 1819–1876.

Gatev, Evan, and Philip E Strahan. 2006. "Banks' advantage in hedging liquidity risk: Theory and evidence from the commercial paper market." *The journal of finance*, 61(2): 867–892.

References III

Gilje, Erik P, Elena Loutskina, and Philip E Strahan. 2016. "Exporting liquidity: Branch banking and financial integration." *The Journal of Finance*, 71(3): 1159–1184.

Green, Richard, and Patric H Hendershott. 1996. "Age, housing demand, and real house prices." *Regional Science and Urban Economics*, 26(5): 465–480.

Hendershott, Patric H, Barry P Bosworth, and Dwight M Jaffee. 1980. "Real user costs and the demand for single-family housing." *Brookings Papers on Economic Activity*, 1980(2): 401–452.

Ivashina, Victoria, and David Scharfstein. 2010. "Bank lending during the financial crisis of 2008." *Journal of Financial economics*, 97(3): 319–338.

Jiménez, Gabriel, Steven Ongena, José-Luis Peydró, and Jesús Saurina. 2012. "Credit supply and monetary policy: Identifying the bank balance-sheet channel with loan applications." *American Economic Review*, 102(5): 2301–26.

References IV

Kashyap, Anil K, and Jeremy C Stein. 2000. "What do a million observations on banks say about the transmission of monetary policy?" *American Economic Review*, 90(3): 407–428.

Kearl, James R. 1979. "Inflation, mortgage, and housing." *Journal of political economy*, 87(5, Part 1): 1115–1138.

Leombroni, Matteo, Monika Piazzesi, Martin Schneider, and Ciaran Rogers. 2020. "Inflation and the price of real assets." National Bureau of Economic Research.

Mankiw, N Gregory, and David N Weil. 1989. "The baby boom, the baby bust, and the housing market." *Regional science and urban economics*, 19(2): 235–258.

Ortalo-Magne, Francois, and Sven Rady. 2006. "Housing market dynamics: On the contribution of income shocks and credit constraints." *The Review of Economic Studies*, 73(2): 459–485.

Piazzesi, Monika. 2025. "Housing Betas." National Bureau of Economic Research.

References V

Poterba, James M. 1984. “Tax subsidies to owner-occupied housing: an asset-market approach.” *The quarterly journal of economics*, 99(4): 729–752.

Summers, Lawrence H. 1980. “Inflation, the stock market, and owner-occupied housing.” National Bureau of Economic Research.

Topel, Robert, and Sherwin Rosen. 1988. “Housing investment in the United States.” *Journal of political Economy*, 96(4): 718–740.

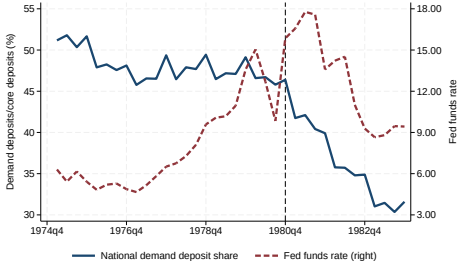
Deposit products in the funding friction construction

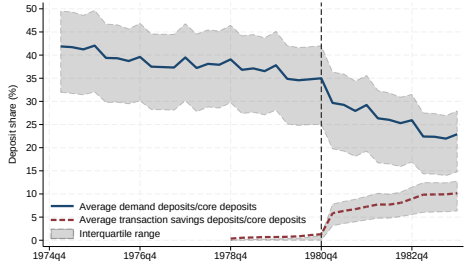
- Savings deposits: use fed funds rate as market rate
- Small time deposits: average market-rate-to-ceiling spread of 3-month, 6-month, 1-year, and 2.5-year CDs
- Demand deposits: treat as savings with implicit return
- Wholesale deposits: no ceiling rate
- Deregulated products: no ceiling rate
  - Money Market Certificates (3- and 6-month), 1978Q2
  - Small Savers Certificates, 1979Q3
  - Transactional savings deposits (NOW and Super NOW), 1980Q4
  - Money Market Deposit Accounts, 1982Q4

Back to measurement

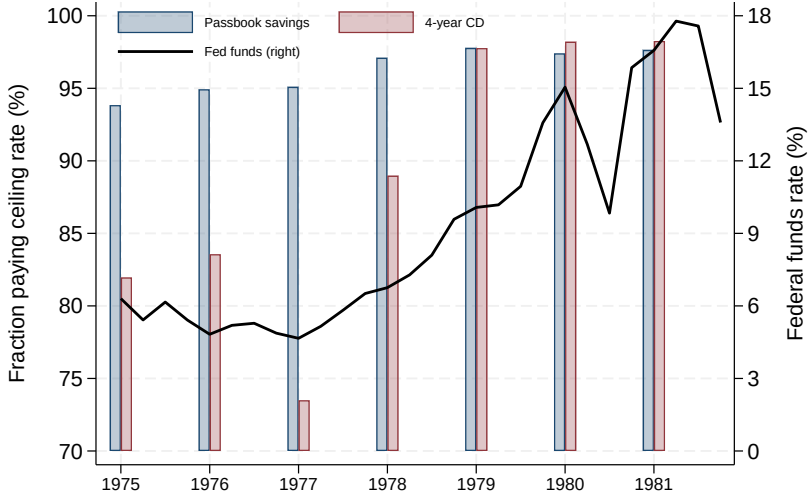
Rationale for assigning implicit return to demand deposits

- Demand deposits paid zero explicit interest under Reg Q until 2011
- The demand-to-core-deposit share falls as the fed funds rate rises
- After transactional savings deposits were introduced in 1980, funds flowed out of demand deposits
- Demand deposits face funding pressure comparable to other retail components Back to measurement



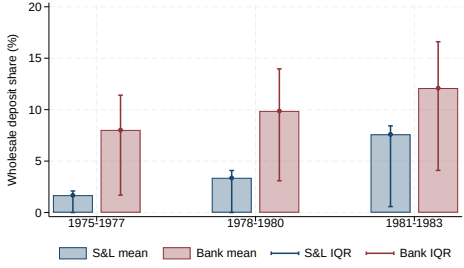


Fraction paying ceiling rate

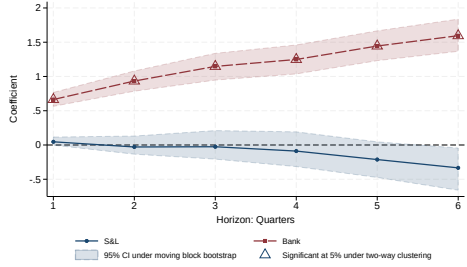


Wholesale deposit mean and shares

Wholesale deposit share



Response to 1 p.p. tightening in ceilings



Back to funding flexibility

Summary statistics: institution level

	S&Ls		Banks	
	Mean (1)	St.Dev. (2)	Mean (3)	St.Dev. (4)
Rate ceiling binding constraint (p.p.)	1.79	1.65	2.66	2.24
Assets (mil.)	133.90	427.18	110.60	1490.69
Mortgages/Assets	0.80	0.18	0.18	0.11
Total loans/Assets			0.60	0.12
Deposits/Assets	0.87	0.07	0.88	0.06
Wholesale deposits/Assets	0.03	0.07	0.09	0.08
Wholesale deposits and alternative funds/Assets	0.07	0.09	0.10	0.09
Year-over-year growth rate (%):				
Mortgages	11.89	20.97	14.05	28.82
Total loans			11.66	15.20
Deposits	13.44	18.45	11.66	13.01
Fraction of deposits:				
Demand	0.00	0.01	0.30	0.13
Savings	0.31	0.16	0.24	0.11
Small time ($\leq$ 100,000)	0.65	0.16	0.36	0.16
Wholesale ($>$ 100,000)	0.04	0.08	0.10	0.10
Institutions	4,523		16,123	
Observations	135,311		503,364	

Summary statistics: CBSA level

	CBSA level				
	Mean (1)	St.Dev. (2)	p25 (3)	Median (4)	p75 (5)
Bank funding frictions (p.p.)	1.895	1.723	0.332	1.406	3.112
S&L funding frictions (p.p.)	0.445	0.641	0.000	0.188	0.660
Housing market:					
Mortgages growth rate (%)	7.467	24.245	1.751	8.952	16.222
Real house price growth rate (%)	−1.120	7.661	−5.468	−0.810	3.553
Mortgage per capita/median income	0.148	0.121	0.082	0.131	0.181
Home price/median income	2.593	0.652	2.140	2.486	2.930
Housing units per capita 1980	0.393	0.055	0.369	0.383	0.402
Housing units per capita 1990	0.361	0.053	0.332	0.360	0.387
Financial institutions:					
S&L share of assets	0.285	0.235	0.118	0.256	0.383
S&L share of deposits	0.286	0.234	0.120	0.257	0.384
S&L share of mortgages	0.533	0.306	0.320	0.603	0.763
Log(Bank wholesale/S&L wholesale)	2.456	1.623	1.480	2.469	3.530
log(Assets)	12.808	1.510	11.946	12.627	13.508
Deposits/Assets	0.870	0.049	0.857	0.881	0.898
Mortgages/Assets	0.370	0.156	0.270	0.353	0.437
Mortgage HHI	0.371	0.234	0.200	0.314	0.486
Demographics:					
log(Population)	11.278	1.166	10.449	11.038	11.830
log(Median income 1980)	9.613	0.180	9.493	9.623	9.732
CBSAs	904				
Observations	31,188				

Back to data Back to local measurement

Mismeasurement in the market rate

- For product j at time t, true spread between market rate and ceiling rate is g_{jt}
- Econometricians observe $\tilde{g}_{jt}$ with mismeasurement: $\tilde{g}_{jt} = g_{jt} + v_{jt}$

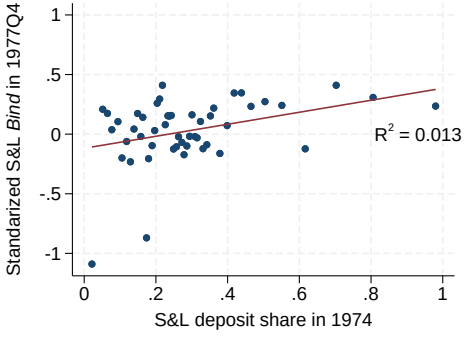
$$\begin{aligned}\text{Observed Bind}_{i,t} &= \sum_j s_{ijt}(g_{jt} + v_{jt}) \\ &= \text{True Bind}_{i,t} + \bar{v}_t + \sum_j s_{ijt}(v_{jt} - \bar{v}_t)\end{aligned}$$

- $\bar{v}_t$: Average mismeasurement across products, **absorbed by time FE**
- **Assumption**: $E[\sum_j s_{ijt}(v_{jt} - \bar{v}_t)] = 0$ conditional on institution characteristics
  - Deposit composition (which reflects legacy business decision) uncorrelated with aggregate product specific mismeasurement

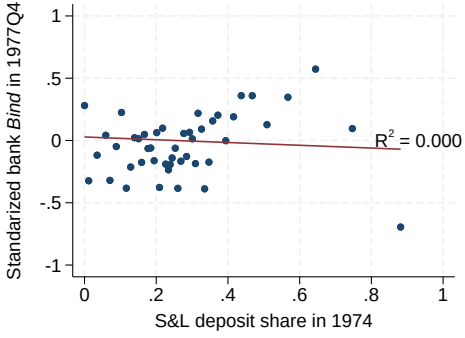
Back to measurement

Is there correlation between S&L reliance and $\text{Bind}_{c,t}$?

$share^{S\&L}_{c,1974}$ and $\text{Bind}^{S\&L}_{c,1977Q4}$

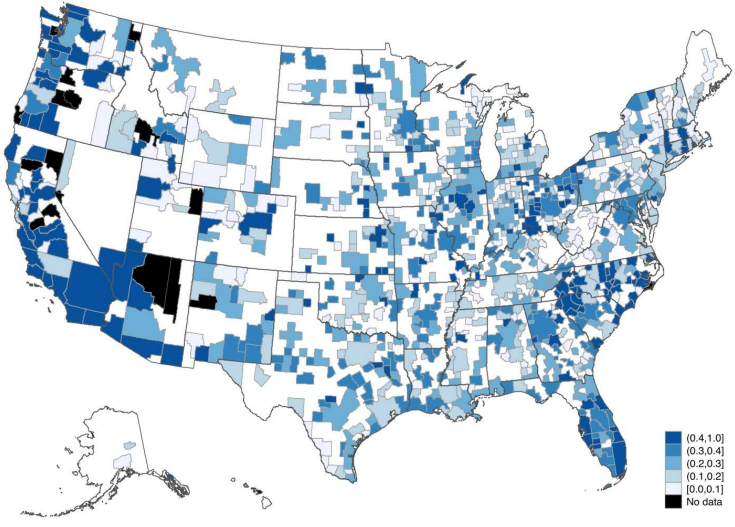


$share^{S\&L}_{c,1974}$ and $\text{Bind}^{Bank}_{c,1977Q4}$



Back to local measurement

Geographic variation in initial S&L deposit share



- Initial share explains 2% variation in $\text{Bind}_{c,t}^{\text{S\&L}}$ and 1% in $\text{Bind}_{c,t}^{\text{Bank}}$

Back to local measurement

What (not) explains the variations in $\text{Bind}_{i,t}$?

- Not any institution fundamentals, local market conditions, or demographics
- **Within state×time:** explain **2.2%** of total variations at S&Ls, **2.5%** at banks

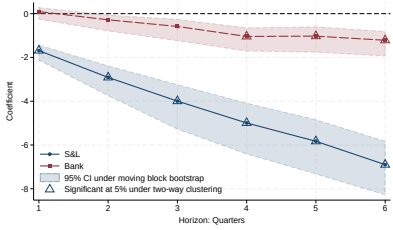
Partial R^2 of S&L $\text{Bind}_{i,t}$ (within state×time)			Partial R^2 of bank $\text{Bind}_{i,t}$ (within state×time)		
Fundamental 2.0%	Asset	1.0%	Fundamental 3.3%	Asset	3.3%
	Mortgage/Asset	0.1%		Mortgage/Asset	0.0%
	Deposit/Asset	0.5%		Deposit/Asset	0.0%
Local Market 1.0%	Deposit HHI	0.2%	Local Market 0.3%	Deposit HHI	0.1%
	Mortgage HHI	0.1%		Mortgage HHI	0.0%
Demographic 4.5%	Population	2.1%	Demographic 2.5%	Population	0.9%
	Population growth	0.2%		Population growth	0.0%
	Median income	1.0%		Median income	0.7%

- Variation reflects **legacy, slow-moving** deposit compositions

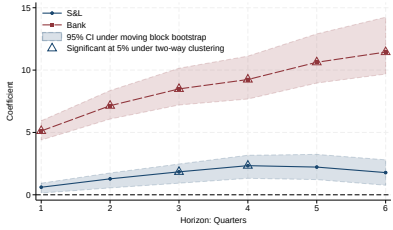
Back to identification

Institution result, treat demand deposits as exempt

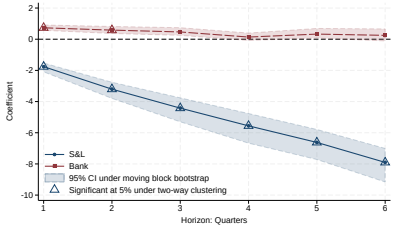
Core deposits



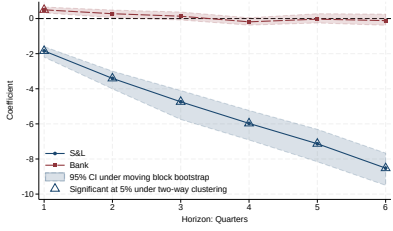
Wholesale deposits



Total deposits

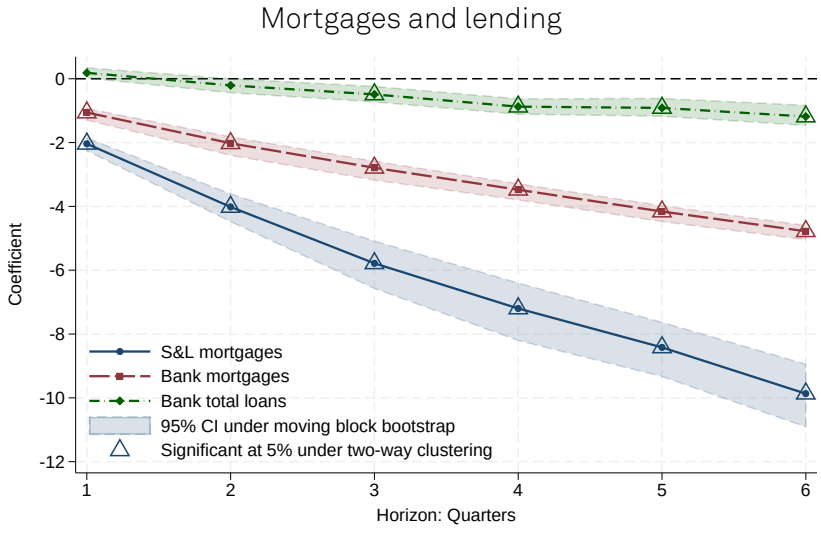


Total deposits + alternative wholesale funds



Back to retail deposits | Back to wholesale deposits | Back to robustness

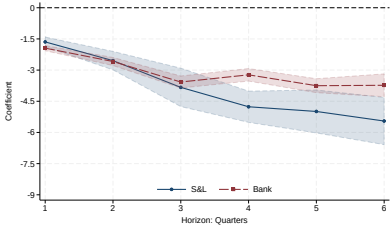
Institution result, treat demand deposits as exempt



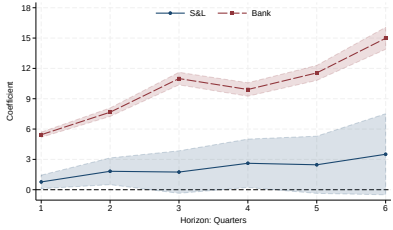
Back to lending response

Non-overlapping horizons on deposit growth

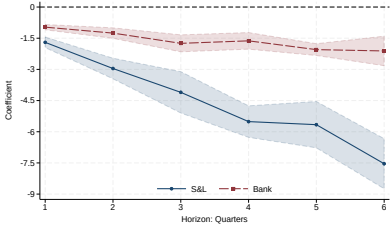
Core deposits



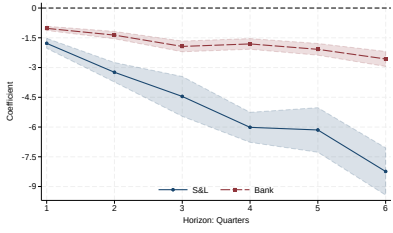
Wholesale deposits



Total deposits

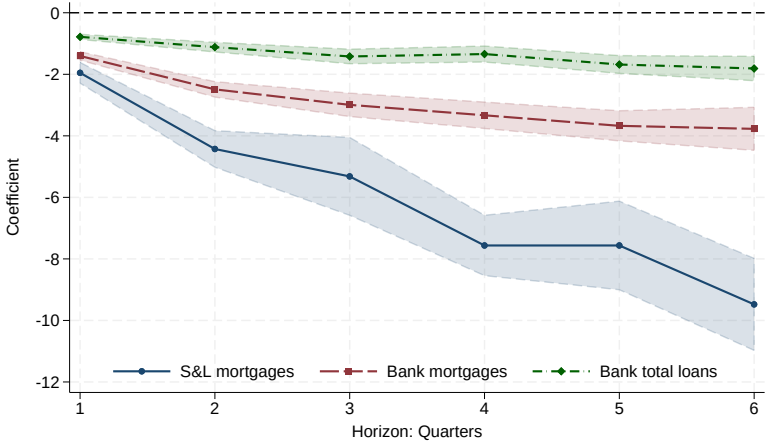


Total deposits + alternative wholesale funds



Back to retail deposits | Back to wholesale deposits | Back to robustness

Non-overlapping horizons on mortgage and loan growth

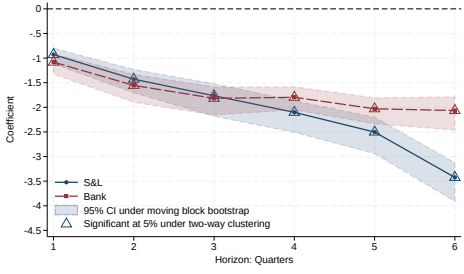


Back to lending response

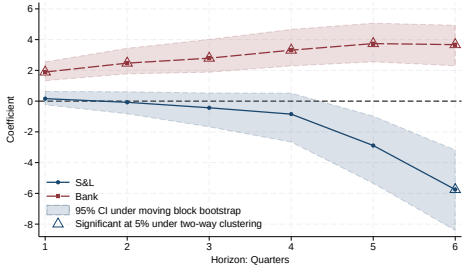
Controlling for core deposit share

$$\Delta y_{i,t\to t+h} = \beta_h \, \mathrm{Bind}_{i,t} + \boldsymbol{\phi}_h^{\top} \mathbf{X}_{i,t} + \delta_{s(i),t} + \varepsilon_{i,t+h}$$

Core deposits



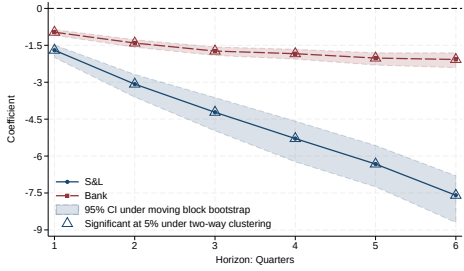
Wholesale deposits



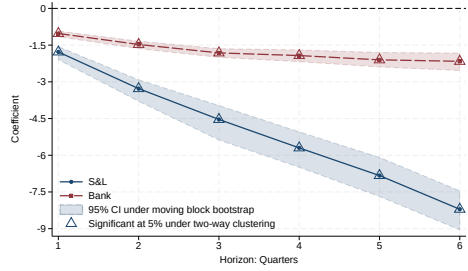
Back to retail deposits
Back to wholesale deposits

Total deposits and funding

Total deposits



Total deposits + non-deposit wholesale funds

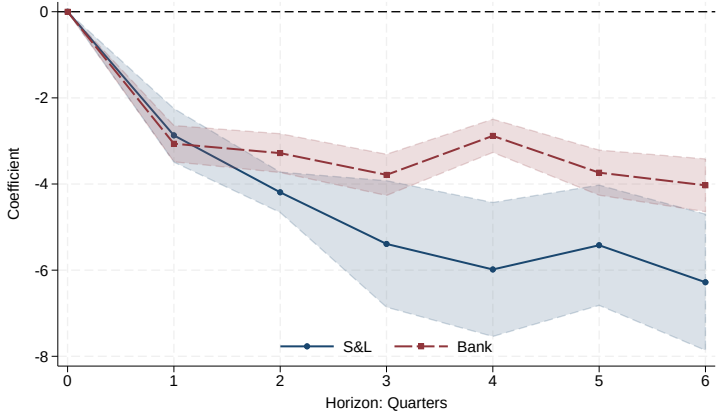


- Non-deposits funds: FHLB advances for S&Ls and fed funds loans and repo for banks
- Non-deposit channels offered limited relief—alternative funds did not offset lost core deposits.

Back to wholesale deposits

Retail deposits, local projections

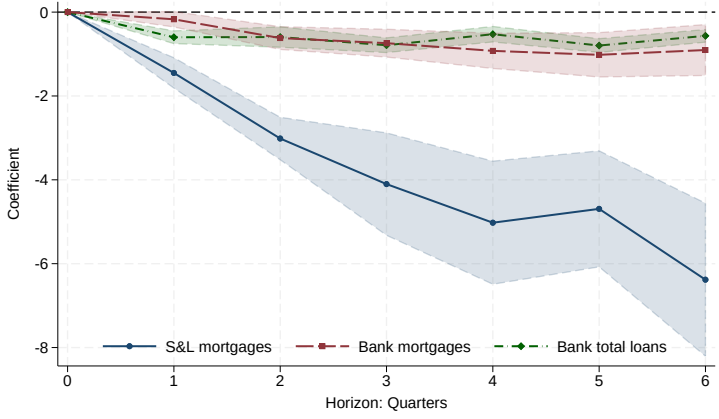
- When effective ceiling tightens by 1 pp, retail deposit growth rate drops by



Back to retail deposits
Back to robustness

Lending response, local projections

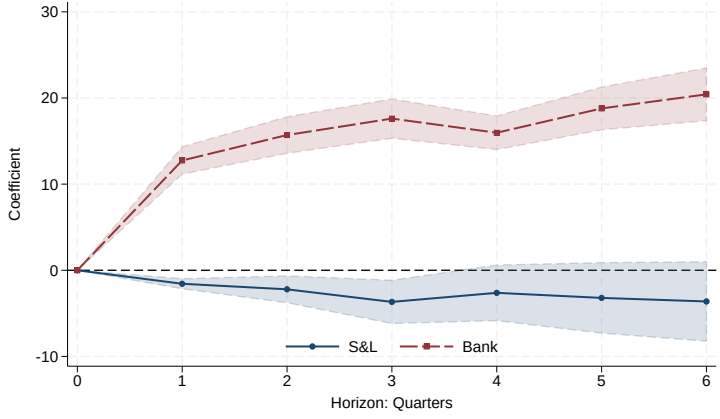
- When effective ceiling tightens by 1 pp, mortgage growth rate drops by



Back to lending response

Wholesale deposits, local projections

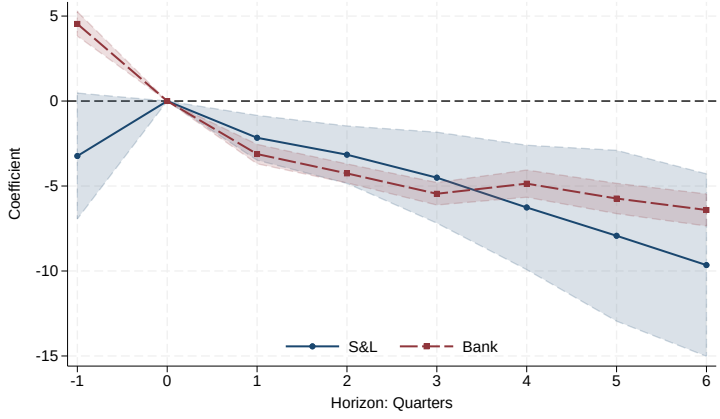
- When effective ceiling tightens by 1 pp, wholesale deposit growth drops by



Back to wholesale deposits

Retail deposits, event study 1977Q4

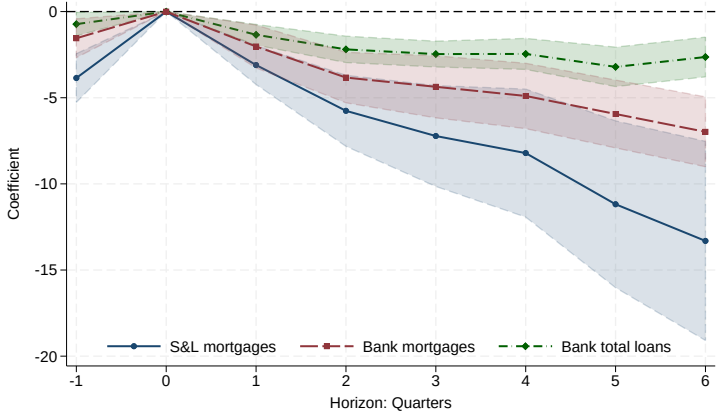
- When effective ceiling tightens by 1 pp, retail deposit growth rate drops by



Back to retail deposits

Lending response, event study in 1977Q4

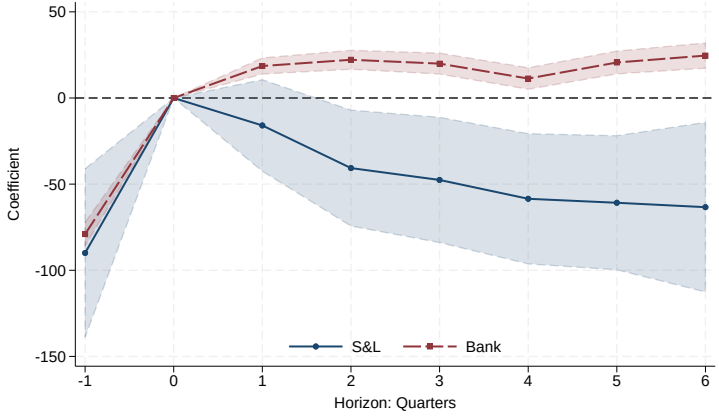
- When effective ceiling tightens by 1 pp, mortgage growth rate drops by



Back to lending response

Wholesale deposits, event study 1977Q4

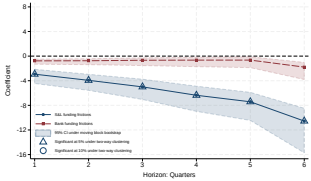
- When effective ceiling tightens by 1 pp, wholesale deposit growth drops by



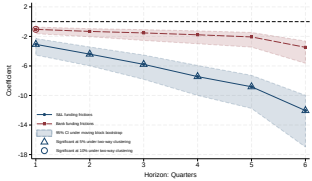
Back to wholesale deposits

Varying demand deposits, mortgage growth

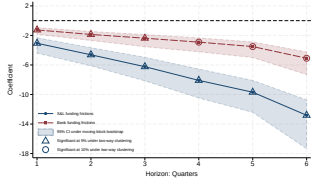
100% Savings



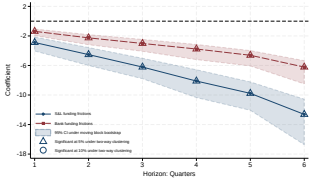
75% Savings and 25% Exempt



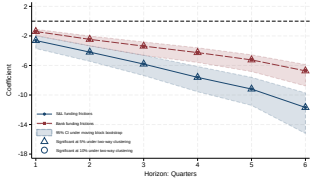
50% Savings and 50% Exempt



25% Savings and 75% Exempt



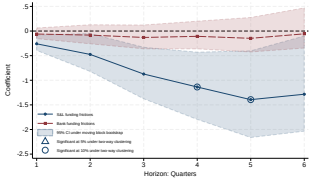
100% Exempt



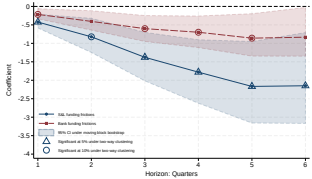
Back to local baseline
Back to robustness

Varying demand deposits, house price growth

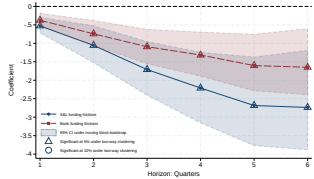
100% Savings



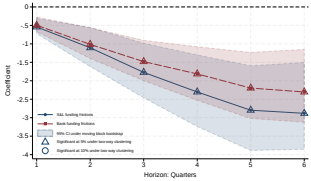
75% Savings and 25% Exempt



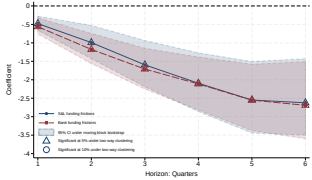
50% Savings and 50% Exempt



25% Savings and 75% Exempt

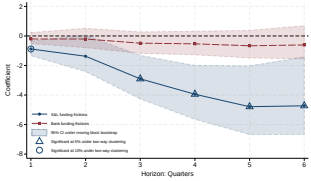


100% Exempt

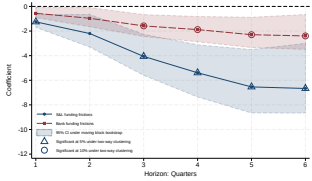


Varying demand deposits, house price/income

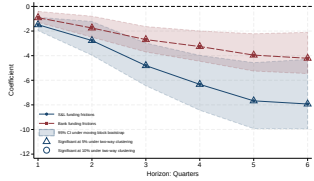
100% Savings



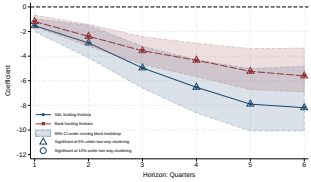
75% Savings and 25% Exempt



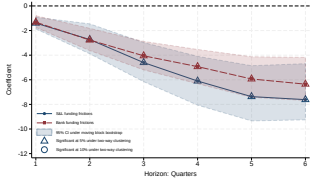
50% Savings and 50% Exempt



25% Savings and 75% Exempt

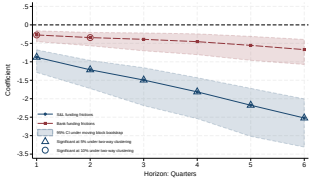


100% Exempt

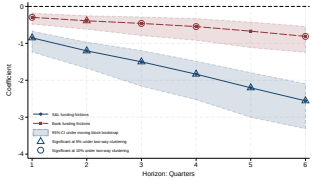


Varying demand deposits, mortgage/income

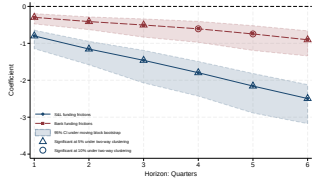
100% Savings



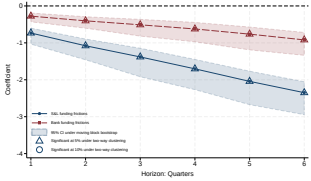
75% Savings and 25% Exempt



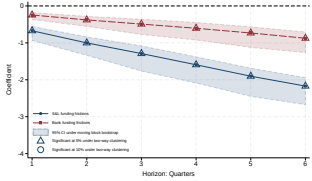
50% Savings and 50% Exempt



25% Savings and 75% Exempt

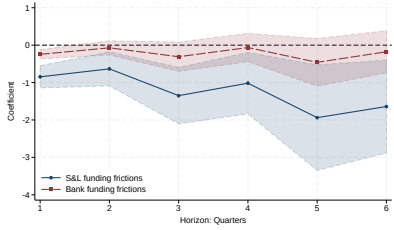


100% Exempt

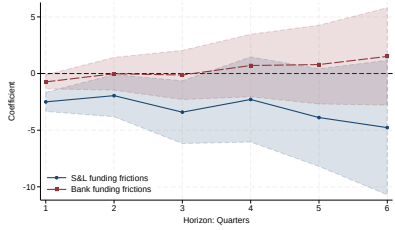


No overlapping horizons on house prices and mortgages

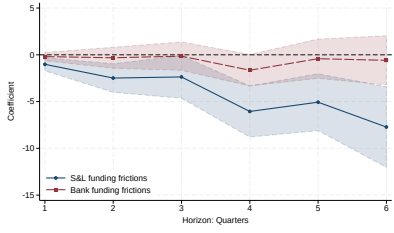
Δ (Mortgage per capita/household income)



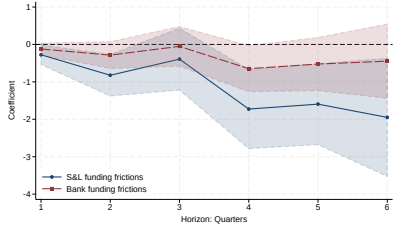
Mortgage growth



Δ (House price/household income)



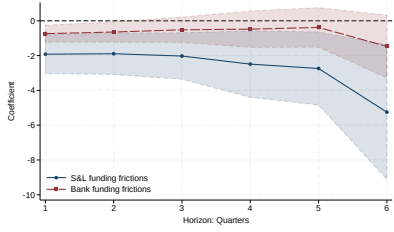
Real house-price growth



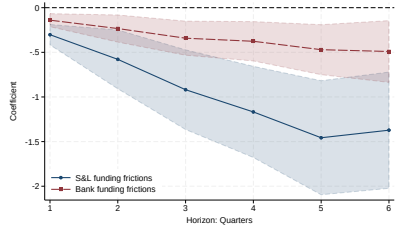
Back to local baseline Back to robustness

Local outcome: Jorda (2005)

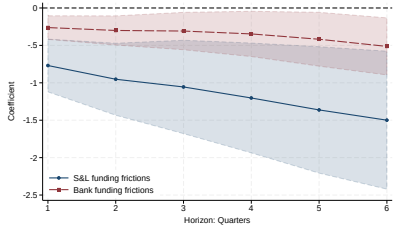
Mortgage growth



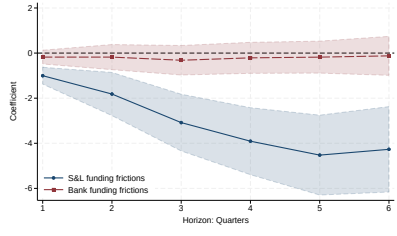
Real house-price growth



Δ (Mortgage per capita/household income)



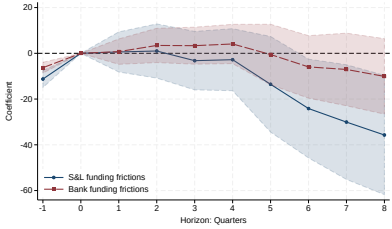
Δ (House price/household income)



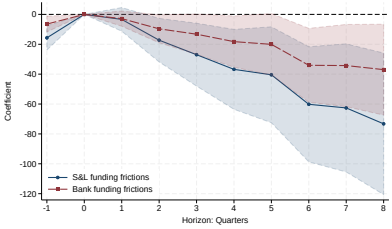
Back to local baseline Back to robustness

Local outcome: Event study 1977Q4

Mortgage growth



Real house-price growth

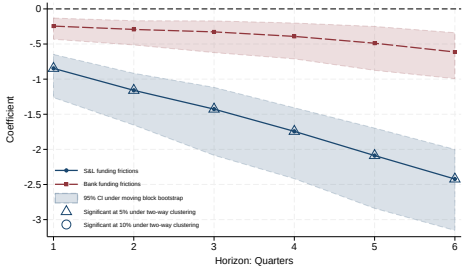


Back to local baseline

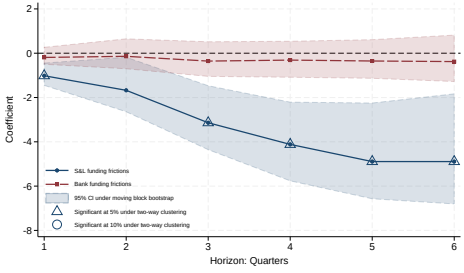
Local housing market: alternative measure

$$\Delta y_{c,t\to t+h} = \beta_{1,h}\,\text{S\&L Friction}_{c,t} + \beta_{2,h}\,\text{Bank Friction}_{c,t} + \boldsymbol{\phi}_h^{\top}\mathbf{X}_{c,t} + \delta_t + \varepsilon_{c,t+h}$$

Δ Per-capita mortgage dollars / income



Δ Real house prices / income



Back to local baseline

Substitution effect between S&Ls and banks

- Areas with higher bank wholesale capacity $\Longrightarrow$ higher substitution effect
- Interaction term of funding friction and relative size of wholesale deposits

$$\text{Rel}_{c,t} \equiv \ln\left(\frac{W_{c,t}^{\text{Bank}}}{W_{c,t}^{\text{S\&L}}}\right)$$

$$\begin{aligned}\Delta y_{c,t\to t+h} = {} & \beta_{1,h}\,\text{S\&LFriction}_{c,t} + \beta_{2,h}\,\text{BankFriction}_{c,t} \\ & + \gamma_{1,h}\left(\text{Rel}_{c,t}\times\text{S\&LFriction}_{c,t}\right) + \gamma_{2,h}\left(\text{Rel}_{c,t}\times\text{BankFriction}_{c,t}\right) \\ & + \kappa_h\text{Rel}_{c,t} + \boldsymbol{\phi}_h^{\top}\mathbf{X}_{c,t} + \delta_t + \varepsilon_{c,t+h}.\end{aligned}$$

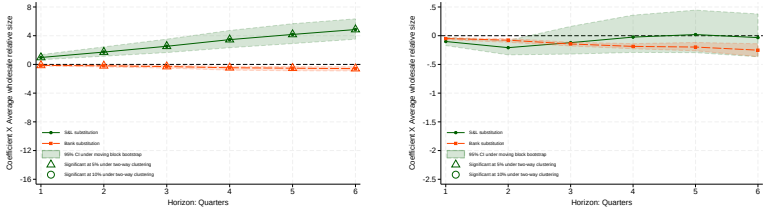
- If substitution exists, $\gamma_{1,h} > 0$

Back to robustness Back to local baseline

Partial offset on mortgages, no offset on prices

Mortgage growth | Real house price growth

Interaction term coefficients



- Green series: $\gamma_{1,h} > 0 \Longrightarrow$ Banks help constrained S&Ls

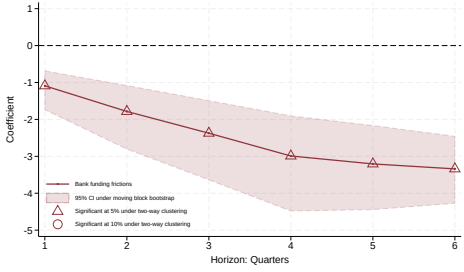
Areas with no S&Ls: Does the supply side play a role?

- Credit crunches at banks constrain construction activities

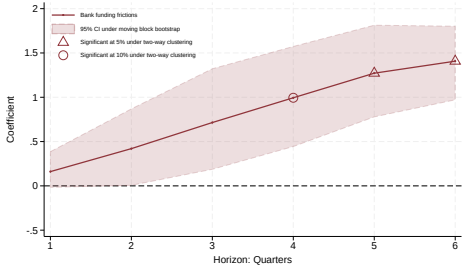
$\Longrightarrow$ Shifting supply curve $\downarrow \Longrightarrow$ house price $\uparrow$

$$\Delta y_{c,t\to t+h} = \beta_h \, \text{Bank Friction}_{c,t} + \boldsymbol{\phi}_h^{\top} \mathbf{X}_{c,t} + \delta_t + \varepsilon_{c,t+h}$$

Mortgage growth



Real house-price growth



Back to local baseline | Back to quantities | Back to robustness

Real effect on housing units in areas without S&Ls

$$\Delta h_{c,1980\to1990} = \alpha + + \beta\, Z(\text{BankFriction})_c + \boldsymbol{\phi}^\top \mathbf{X}_c + \varepsilon_c$$

	Δ Housing units per 1,000 persons (1980–1990)		
	(1)	(2)	(3)
Bank funding frictions 1975–1980	−24.73***	−23.14**	−22.14**
	(8.45)	(8.94)	(8.82)
Demographic controls	Yes	No	Yes
Lending market controls	No	Yes	Yes
Observations	98	98	98
R^2	0.23	0.15	0.24

- Increase in prices and decline in housing quantities $\Longrightarrow$ Supply-side effect dominates on net

Real effect on construction activities

$$\text{Construction employment growth}_{c,t+1} = \beta_1 \text{ S\&L Funding frictions}_{c,t} + \beta_2 \text{ Bank Funding frictions}_{c,t} + \boldsymbol{\phi}\mathbf{X}_{c,t} + \text{Time FE} + \epsilon_{c,t}$$

	Construction employment growth		
	(1)	(2)	(3)
S&L funding frictions	−8.11*	−6.31*	−7.65*
	(4.23)	(3.74)	(4.10)
Bank funding frictions	−4.15	−3.59	−4.16
	(2.58)	(2.26)	(2.54)
Year FE	Yes	Yes	Yes
Demographic controls	Yes	No	Yes
Lending market controls	No	Yes	Yes
Observations	6,008	6,033	6,008
No. of CBSA	862	862	862
No. of year	8	8	8
R^2	0.01	0.01	0.01

- Standard errors are clustered at CBSA level
- Controls $\mathbf{X_{i,t}}$: CBSA demographics (population and median income) and lending market characteristics (assets, deposit ratio, mortgage concentration)

Back to quantities

What drives the impact? Ceiling tightness or reliance?

- Sort CBSAs on initial S&L share into quartiles
- Regress housing outcome on $\text{Bind}_{c,t}^{\text{S\&L}}$

	S&L reliance quartiles			
	1	2	3	4
Mortgage outcome:				
Δ Per-capita mortgage amount / income	-0.21^{**}	-0.65^{***}	-1.21^{**}	-1.96^{**}
	(0.11)	(0.22)	(0.57)	(0.92)
House price outcome:				
Δ Real house price / income	-2.40	-3.67^{***}	-5.37^{**}	1.85
	(2.11)	(1.27)	(1.99)	(2.40)
CBSAs in each bin	221	221	221	221

Back to local baseline Back to robustness