

The Economics of Market-Based Deposit Insurance

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Deposit insurance

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Fundamental Question: How does access to deposit insurance affect depositor and bank behavior?

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Theoretical literature identifies trade-offs:

1. **Financial Stability:** Deposit insurance protects depositors from bank failures, reducing the risk of bank runs
2. **Moral Hazard:** Deposit insurance may encourage banks to take on riskier investments, potentially increasing the likelihood of future failures

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However, causal evidence is limited...

Our Setting: 2023 banking crisis

THE WALL STREET JOURNAL.

March 16, 2023 at 1:00 PM ★

What Is a Bank Run—and Why Was Silicon Valley Bank Hit by One?

By *Bob Henderson*

- Silicon Valley Bank weighted its investments in favor of **longer-dated securities**. That gave them the potential of higher returns, but also of steeper losses when interest rates rose.
- The banks had many of **depositors of a similar type**, with SVB catering largely to venture capitalists and technology start-ups and Signature Bank to cryptocurrency firms. That increased the risk that those depositors would act in unison when withdrawing money.
- They had a **lot of deposits over the \$250,000 FDIC insurance limit**. That put many depositors at risk of loss in the case of a run, which may have prompted them to try to get out ahead of the crowd.



“Reciprocal deposits”



US regional banks swap \$220bn in deposits to soothe insurance nerves

NEW YORK, May 24, 2023 – US regional banks are rushing to exploit rules that allow depositors to hold tens of millions of dollars in insured accounts, offering security far exceeding government-backed insurance to soothe clients unnerved by the recent banking turmoil.

Among regional banks advertising high-balance insured accounts is PacWest Bancorp, which like the former SVB often lends to start-ups and their investors. Beverly Hills, California-based PacWest’s website says clients can “rest assured” because the bank can offer up to \$175mn in insurance coverage per depositor, or 700 times the FDIC cap.

Shares of PacWest have plunged more than a third since mid-March. The bank said in its most recent financial filing that it was enrolling more of its customers in “reciprocal deposit networks”, over which hundreds, or in some cases thousands, of banks spread customers’ funds in order to stretch insurance limits.

“Reciprocal deposits”

FT FINANCIAL
TIMES

US regional banks soothe insurance net

NEW YORK, May 24, 2023 – US regional banks have allowed depositors to hold tens of millions of dollars in security far exceeding government-backed FDIC insurance, the recent banking turmoil.

Among regional banks advertising high deposit capacity is New York Community Bancorp, which like the former SVB Financial Group, Beverly Hills, California-based PacWest Bancorp, because the bank can offer up to \$175 billion in deposits, 700 times the FDIC cap.

Shares of PacWest have plunged more than 50% in its most recent financial filing that it has expanded “reciprocal deposit networks”, over 100 regional banks spread customers’ funds in or



NYCB discloses over \$18.7 bln in reciprocal deposit capacity, shares rise

February 15, 2024 – New York Community Bancorp (NYCB.N) shares rose 5% on Thursday after it disclosed it has more than **\$18.7 billion in reciprocal deposit capacity** to offer its customers expanded deposit insurance, **calming investor worries around its stability**.

NYCB said if it utilizes the reciprocal deposit capacity, its **share of fully insured deposits to total deposits would be 95%**.

"It's important that such a high level of deposits are insured and I think the outright risk of a run on the bank on deposits is somewhat muted," D. A. Davidson analyst Peter Winter told Reuters..

Traditional deposit insurance

 \$250K

 \$250K, amount insured



Customer



Relationship bank

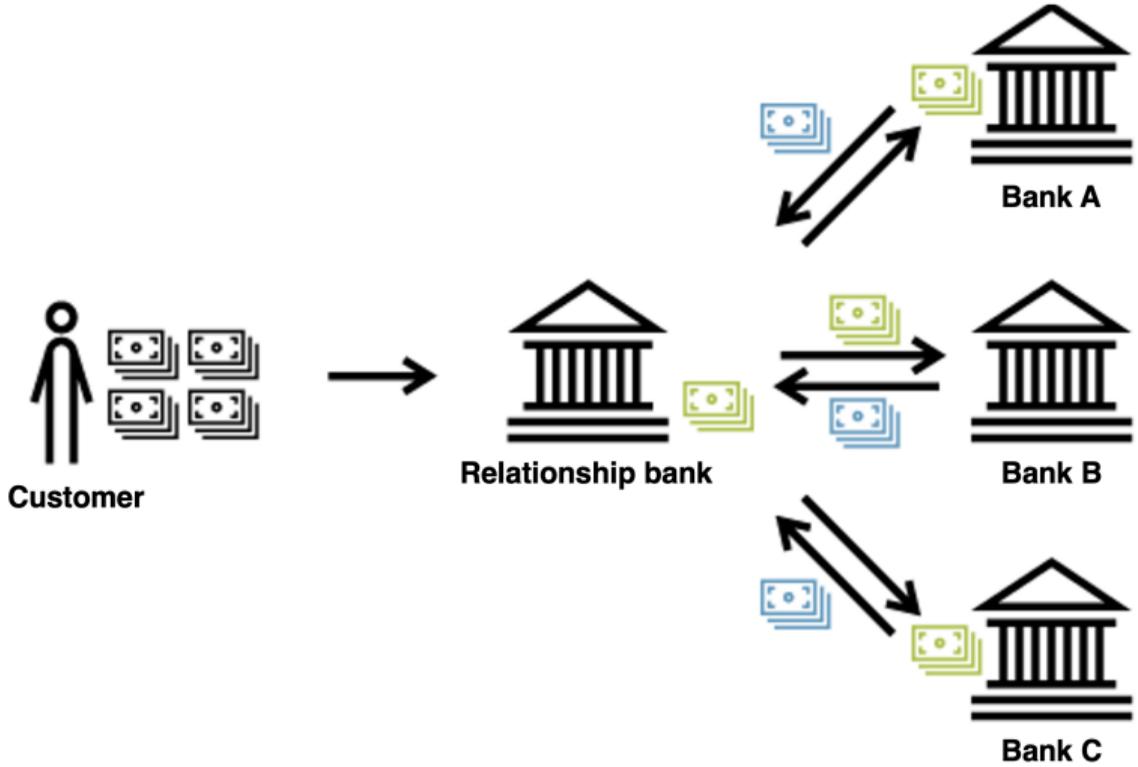
The standard deposit insurance coverage limit is \$250,000 per depositor, per FDIC-insured bank, per ownership category.

Credit: Saddat Sarfraz

Source: FDIC

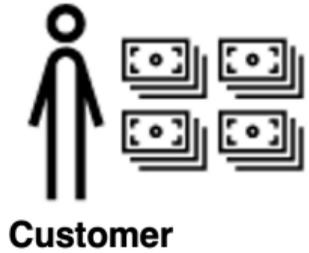
Reciprocal Deposits: A market-based solution

 \$250K  \$250K, amount insured  \$250K, amount insured, reciprocated



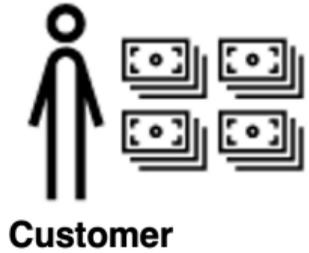
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Roadmap

1. **Study a new market enabled by financial innovation**

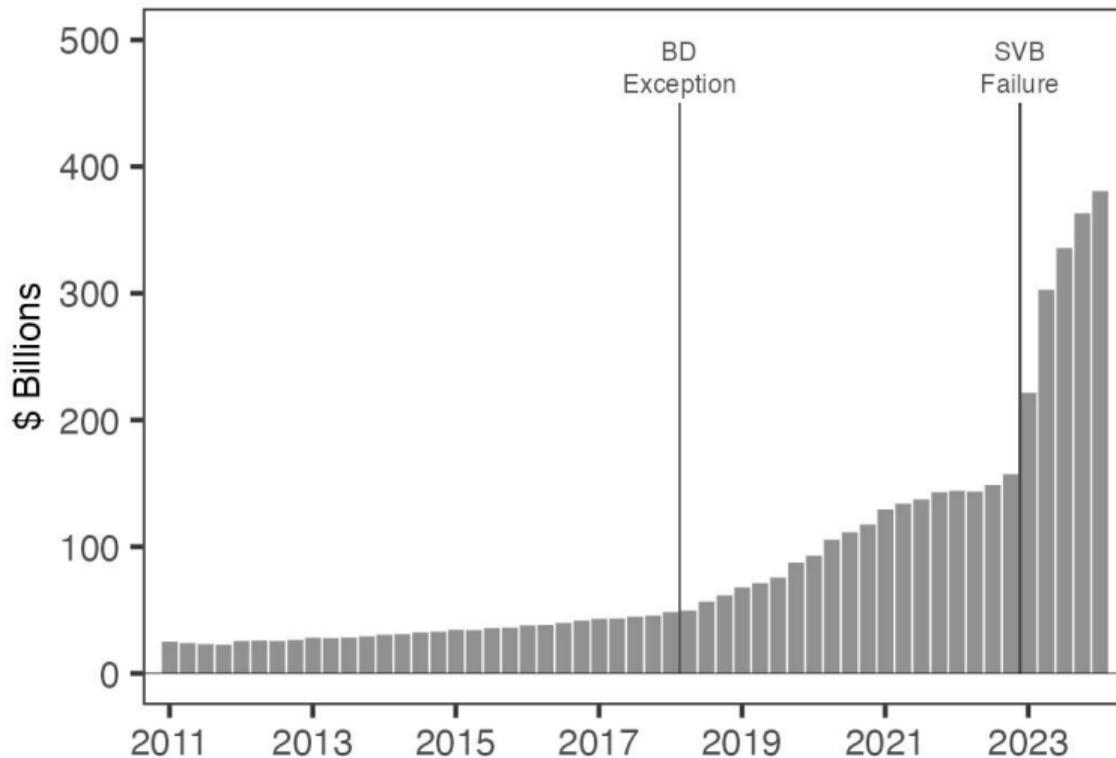
- History and evolution of reciprocal deposits
- Description of key participants

Roadmap

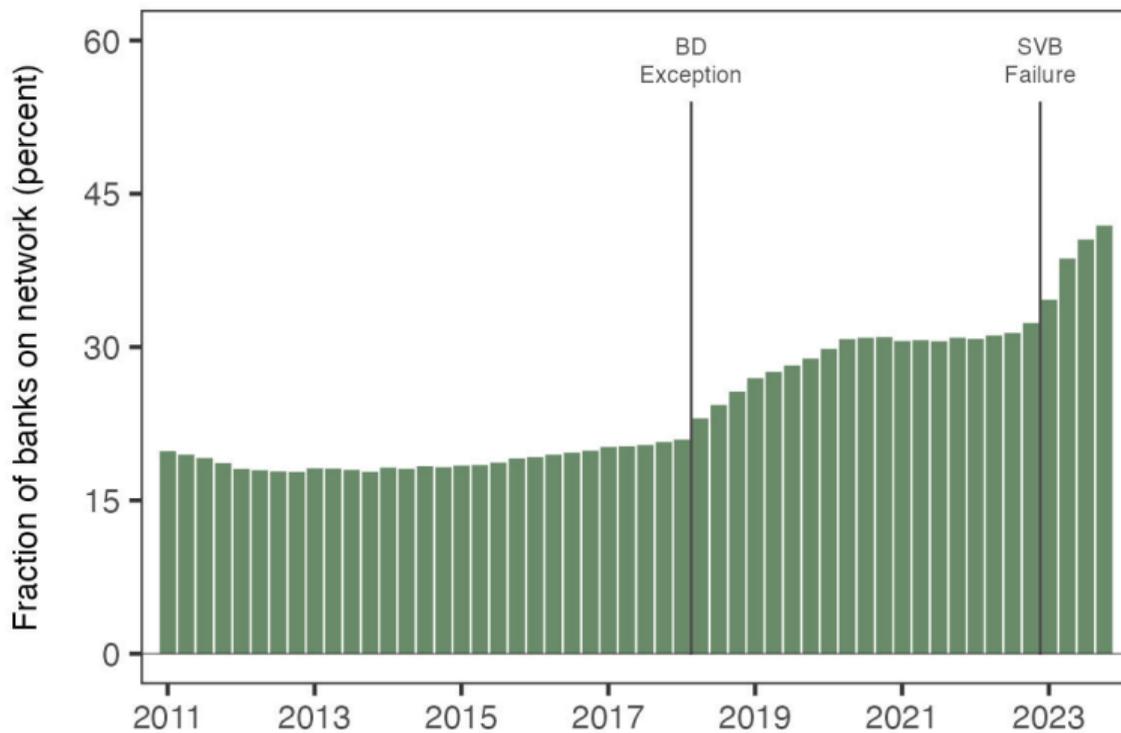
1. **Study a new market enabled by financial innovation**
 - History and evolution of reciprocal deposits
 - Description of key participants
2. **Use the market as an empirical laboratory to address fundamental questions in banking regulation**
 - **Financial Stability**: Does deposit insurance affect depositor behavior?
 - **Moral Hazard**: Do banks' risk-taking decisions change?
 - **IO of Banking Sector**: Does enhanced deposit insurance reduce the advantage of very large banks?

I. NEW FACTS

1. Emergence of reciprocal deposits



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Process of network adoption:

- Integrate systems with provider
- Obtain know your customer verification and custodian approval
- Prepare agreements and client disclosures

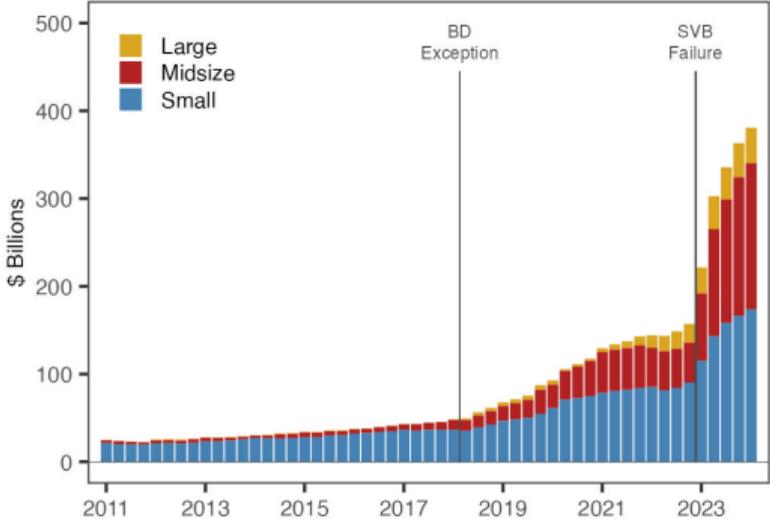
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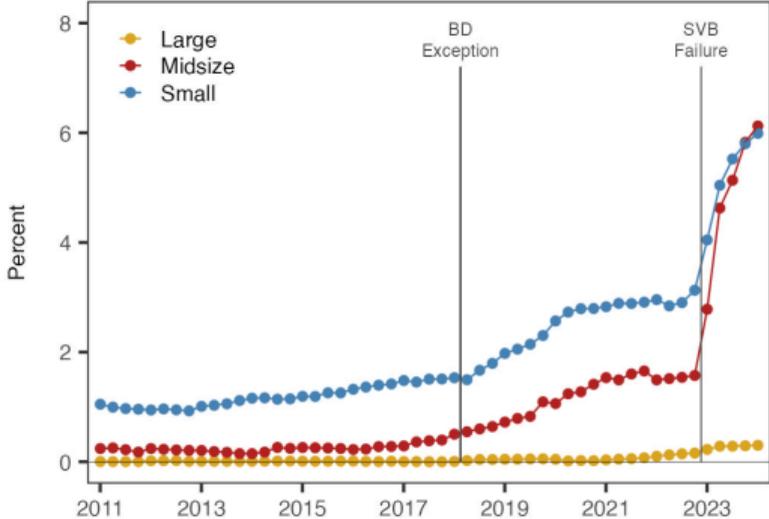
- Integrate systems with provider
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- Prepare agreements and client disclosures

Typically takes **three to six months** to join the network

2. Small and midsize banks use reciprocal deposits

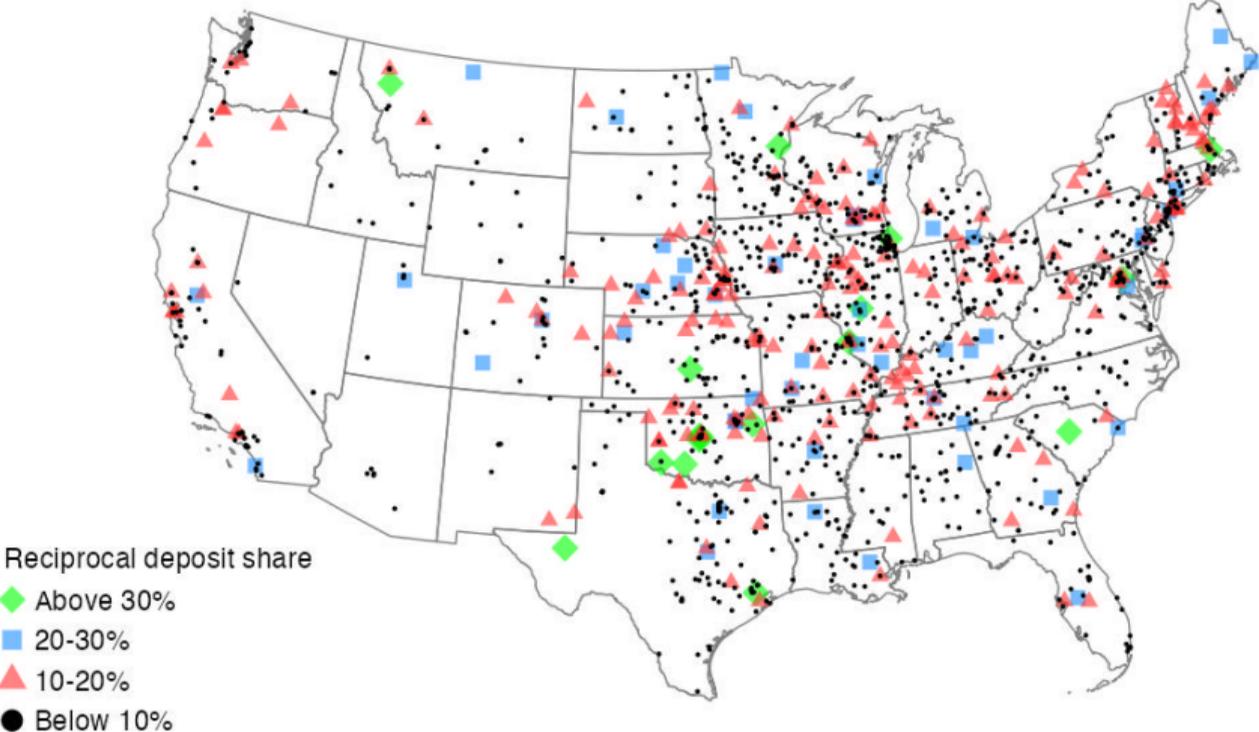


(a) Reciprocal Deposits (\$ bns)



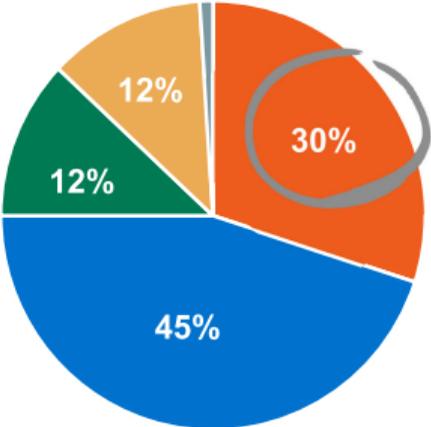
(b) Reciprocal Share (%)

3. Network banks are everywhere (2022Q4)



4. Main clients are public entities, businesses, and nonprofits

ICS Reciprocal Balances



- Public Entities ■ Businesses ■ Nonprofits
- Individuals ■ Banks

Businesses

- Large corporations
- Mid-size companies
- Small businesses
- Franchises

Public Entities

- Government agencies
- Municipalities
- Police departments
- Fire districts
- Public colleges and universities
- Public hospitals
- School districts
- State funds
- Utility districts

Nonprofits

- Charities
- Religious institutions
- Private colleges and universities
- Foundations
- Endowments
- Foundations
- Homeowners/Condo associations
- Hospitals

Others

- Banks and credit unions
- Escrow/Title companies
- Estate planners
- Private investors
- Trusts/Trustees
- 1031 exchange participants

II. DEPOSITOR AND BANK BEHAVIOR DURING THE 2023 BANKING CRISIS

Empirical design

Key challenge: No cross-sectional or time-series variation in deposit insurance coverage

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Our approach: Bank's presence on the reciprocal deposit network in 2022Q4 as a source of variation

Model

$$\Delta Y_{2023Q4,2022Q4}^j = \alpha + \beta \mathbb{1}_{Network,j,2022Q4} + \gamma X_j + \epsilon_j$$

Empirical design

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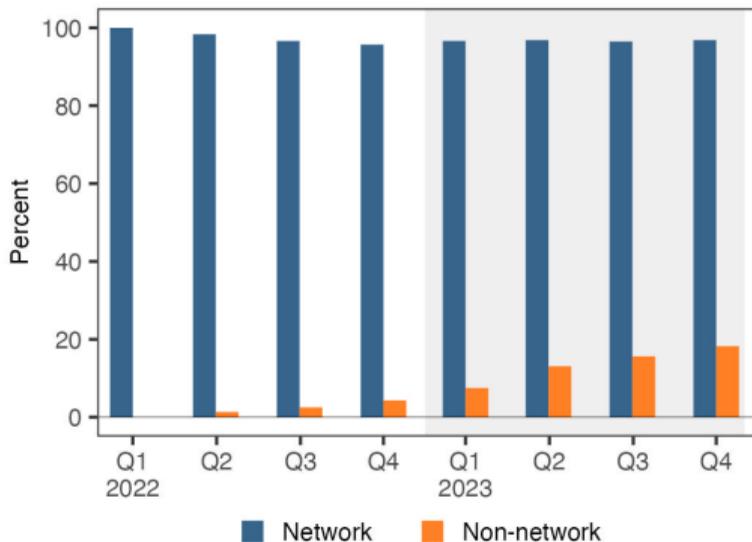
Model

$$\Delta Y_{2023Q4,2022Q4}^j = \alpha + \beta \mathbb{1}_{Network,j,2022Q4} + \gamma X_j + \epsilon_j$$

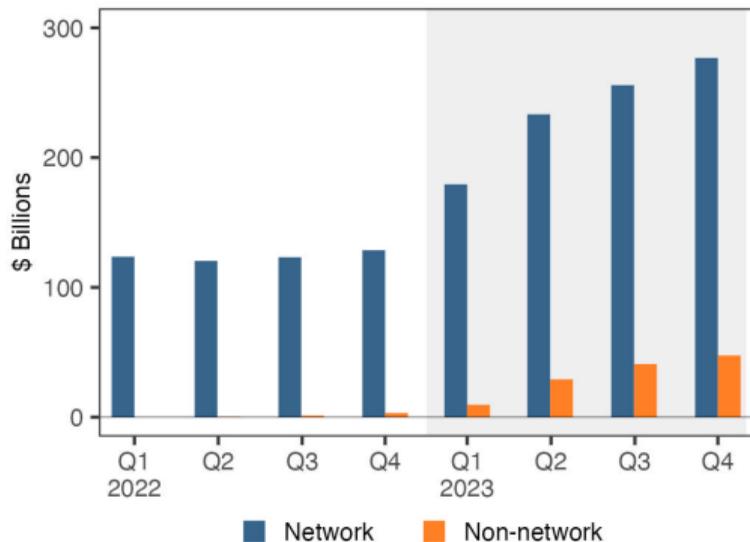
Assumptions:

1. Non-network banks couldn't join at the onset of banking crisis in March 2023
2. Network banks have access to enhanced deposit insurance

Validation of assumptions



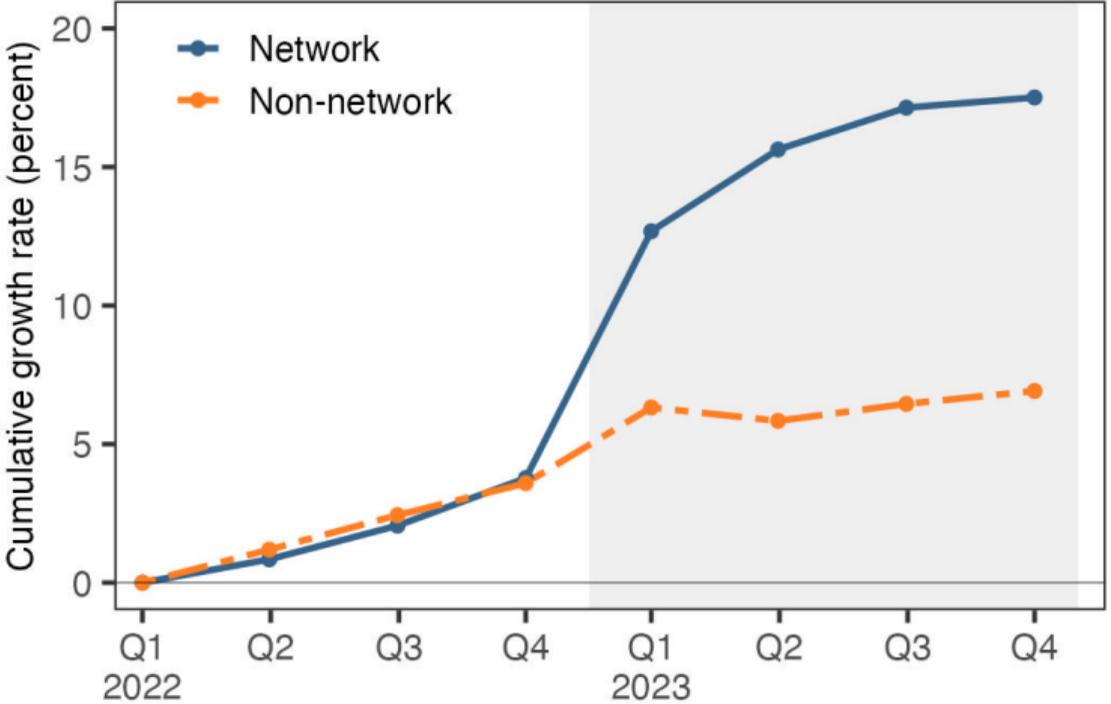
(a) Network Participation



(b) Reciprocal Deposits

- **Gradual adoption:** Only 3.3% of **non-network banks** join by 2023Q1; 18% by 2023Q4
- **Network banks** accounted for most of post-crisis reciprocal deposit growth

Validation of assumptions



Insured deposits grew at network banks

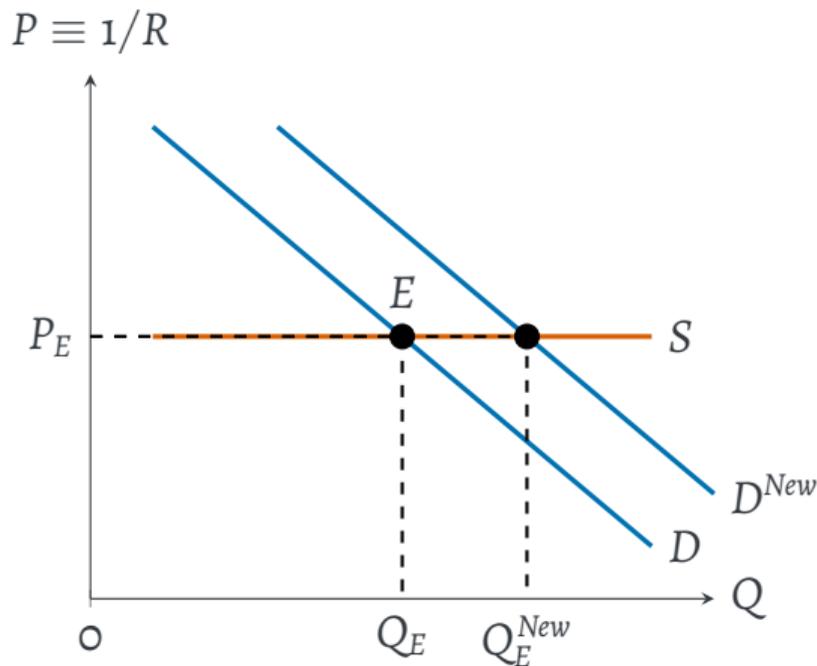
	(1)	(2)
	$\Delta \ln(\text{Ins. Dep.})$	$\Delta \ln(\text{Ins. Dep.})$
Network _{2022Q4}	0.0780*** (0.0056)	0.0567*** (0.0060)
ROA _{2022Q4}		-0.0597*** (0.0171)
Securities/Assets _{2022Q4}		-0.0022*** (0.0002)
Equity/Assets _{2022Q4}		0.0041*** (0.0009)
$\ln(\text{Assets})_{2022Q4}$		0.0065*** (0.0018)
Constant	0.0476*** (0.0027)	-0.0047 (0.0264)
Observations	4,546	4,546
R ²	0.0474	0.1194

Network banks attracted new deposits

	(1)	(2)
	$\Delta \ln(\text{Tot. Dep.})$	$\Delta \ln(\text{Tot. Dep.})$
Network _{2022Q4}	0.0396 ^{***} (0.0032)	0.0265 ^{***} (0.0034)
ROA _{2022Q4}		-0.0321 ^{***} (0.0108)
Securities/Assets _{2022Q4}		-0.0017 ^{***} (0.0001)
Equity/Assets _{2022Q4}		0.0030 ^{***} (0.0006)
$\ln(\text{Assets})_{2022Q4}$		0.0023 ^{**} (0.0012)
Constant	0.0078 ^{***} (0.0019)	-0.0016 (0.0174)
Observations	4,546	4,546
R ²	0.0313	0.1280

Pricing effects

If banks supply insured deposits **perfectly elastically**, an increase in demand should have **no effect** on deposit interest rates



Network banks paid less interest on insured deposits

	(1)	(2)	(3)	(4)
	Δ Dep. Rate	$\Delta \ln(\text{Time Dep.})$	Δ Dep. Rate	$\Delta \ln(\text{Time Dep.})$
Network _{2022Q4}	-0.1641*** (0.0390)	0.1083*** (0.0113)	-0.0899** (0.0428)	0.0406*** (0.0124)
ROA _{2022Q4}			0.2439** (0.1098)	0.0014 (0.0346)
Securities/Assets _{2022Q4}			0.0038** (0.0015)	-0.0021*** (0.0004)
Equity/Assets _{2022Q4}			0.0018 (0.0057)	-0.0045** (0.0019)
$\ln(\text{Assets})_{2022Q4}$			-0.0420*** (0.0147)	0.0446*** (0.0044)
Constant	1.0973*** (0.0233)	0.3285*** (0.0062)	1.4430*** (0.2076)	-0.1384** (0.0618)
Observations	3,379	3,379	3,379	3,379
R ²	0.0052	0.0283	0.0115	0.0811

- Network banks paid **9-16 bps** lower interest rates on insured CDs
- **1 bp** decrease in the interest rate is associated with **0.45 pp** increase in the quantity of CDs supplied

Moral Hazard: Interest rate risk

	(1)	(2)	(3)	(4)	(5)	(6)
	$\Delta \ln(\text{Securities})$	$\Delta \ln(\text{Maturity})$	$\mathbb{1}[\text{Increase MatGap}]$	$\Delta \ln(\text{Securities})$	$\Delta \ln(\text{Maturity})$	$\mathbb{1}[\text{Increase MatGap}]$
Network _{2022Q4}	0.0200*** (0.0064)	0.0397*** (0.0083)	0.0552*** (0.0155)	0.0133* (0.0070)	0.0173** (0.0088)	0.0582*** (0.0168)
ROA _{2022Q4}				0.0507*** (0.0178)	0.0331 (0.0260)	0.0596** (0.0287)
Equity/Assets _{2022Q4}				0.0007 (0.0005)	0.0012 (0.0009)	0.0004 (0.0009)
$\ln(\text{Assets})_{2022Q4}$				0.0060** (0.0025)	0.0193*** (0.0032)	-0.0021 (0.0054)
Constant	-0.0761*** (0.0038)	-0.1509*** (0.0053)	0.5801*** (0.0090)	-0.1728*** (0.0324)	-0.4134*** (0.0425)	0.5851*** (0.0698)
Observations	4,495	4,495	4,495	4,495	4,495	4,495
R ²	0.0021	0.0045	0.0028	0.0099	0.0162	0.0040

- Network banks took on more interest rate risk with new inflows of deposits
- Increase of **1.33-2 pp** securities growth; **1.73-3.97 pp** avg maturity; **5.5-5.8 pp** in maturity mismatch

III. IDENTIFICATION

Key identification concerns

- Our results cannot be explained by observable differences in **bank size, leverage, profitability, and exposure to interest rate risk**

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 1. Network banks have stickier depositor base
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Risk vs. Deposit insurance access

Channel #1: Bank risk

Non-network banks experience a greater decline in uninsured deposits relative to insured deposits post-crisis

- Under financial distress, banks lose uninsured deposits more than insured deposits (Egan et al., 2017)

Channel #2: Access to Insurance

Network banks experience a greater decline in uninsured deposits relative to insured deposits post-crisis

- Insured deposits grow faster at network banks through reciprocal deposits

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Triple difference-in-differences:

$$Y_{b,q}^i = \alpha_{b,q} + \beta_1 \mathbb{1}_{Network_b} \times \mathbb{1}_{Post_q} \times \mathbb{1}_{Ins_i} + \beta_2 \mathbb{1}_{Network_b} \times \mathbb{1}_{Ins_i} + \beta_3 \mathbb{1}_{Post_q} \times \mathbb{1}_{Ins_i} + \epsilon_{b,q}^i$$

Testing the insurance access channel

In(Dep.)	(1)
$\text{Network} \times \text{Post} \times \mathbb{1}_{\text{Insured}}$	0.1000*** (0.0124)
$\text{Network} \times \mathbb{1}_{\text{Insured}}$	-0.0909*** (0.0226)
$\text{Post} \times \mathbb{1}_{\text{Insured}}$	0.0833*** (0.0052)
$\mathbb{1}_{\text{Insured}}$	0.5269*** (0.0121)
$\text{Bank} \times \text{Quarter-Year FE}$	✓
N	68,058
R^2	0.9532

- 8.33% higher insured deposits after crisis; 10% even higher insured deposits for network banks
- Evidence rejects the risk channel in favor of the deposit insurance channel

Identification using a regulatory change

Public entities

- Examples: Municipal governments, school districts, fire departments
- Deposits placed at banks must be **collateralized or insured**

Identification using a regulatory change

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Advent of reciprocal deposits led to:

- Relaxation of collateralization constraints
- Reduced frictions for obtaining deposit insurance on large deposits
- Opportunity for banks to raise new deposits

FDIC brokered deposits exemption (2018)

- Even after states allowed reciprocal deposits for public entities, banks faced higher regulatory costs due to “brokered deposits” classification
- The FDIC’s 2018 ruling reclassified some reciprocal deposits as non-brokered, further relaxing constraints for joining the network

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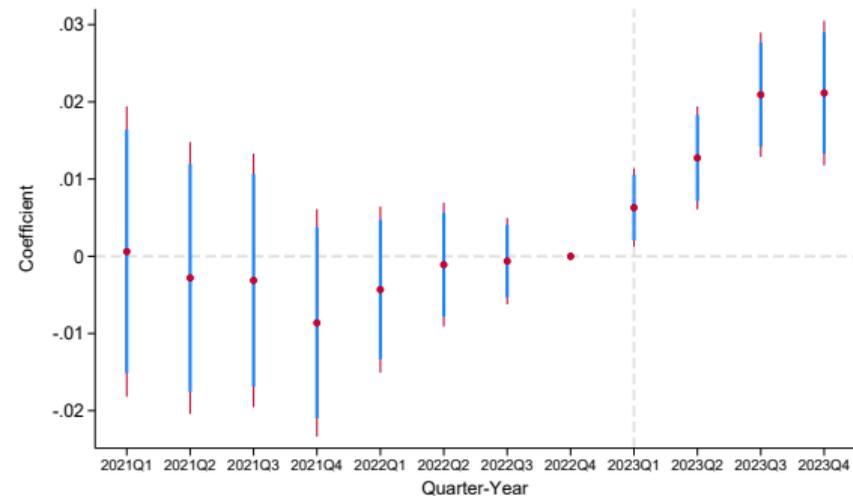
- Even after states allowed reciprocal deposits for public entities, banks faced higher regulatory costs due to “brokered deposits” classification
 - The FDIC’s 2018 ruling reclassified some reciprocal deposits as non-brokered, further relaxing constraints for joining the network
- ⇒ Banks that “switched” around this ruling did so for regulatory reasons

Difference-in-differences design

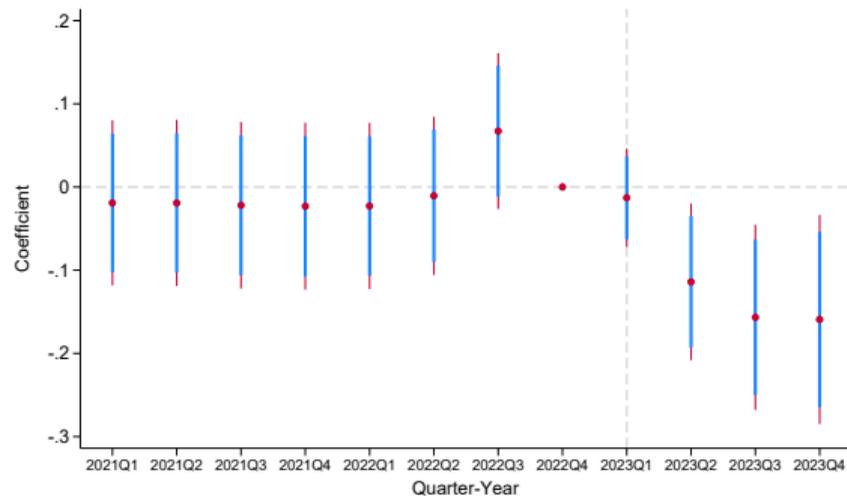
$$Y_{b,q} = \alpha_b + \delta_q + \beta \cdot Switcher_b \times Post_q + \Sigma \gamma (X_b \times Post_q) + \epsilon_{b,q}$$

- $Y_{b,q}$: Outcome variable for bank b in year-quarter q
- $Post_q$: Indicator variable for 2023Q1 or later
- $Switcher_b$: Indicator variable for whether a bank b with public entity deposits joined the network between 2015Q1 and 2020Q2
- X_b : Bank size, securities holdings, maturity of securities portfolio, capitalization, public entity deposits, and profitability (2022Q4)
- α_b, δ_q : Bank and year-quarter fixed effects

Dynamic effects on deposit quantities and prices

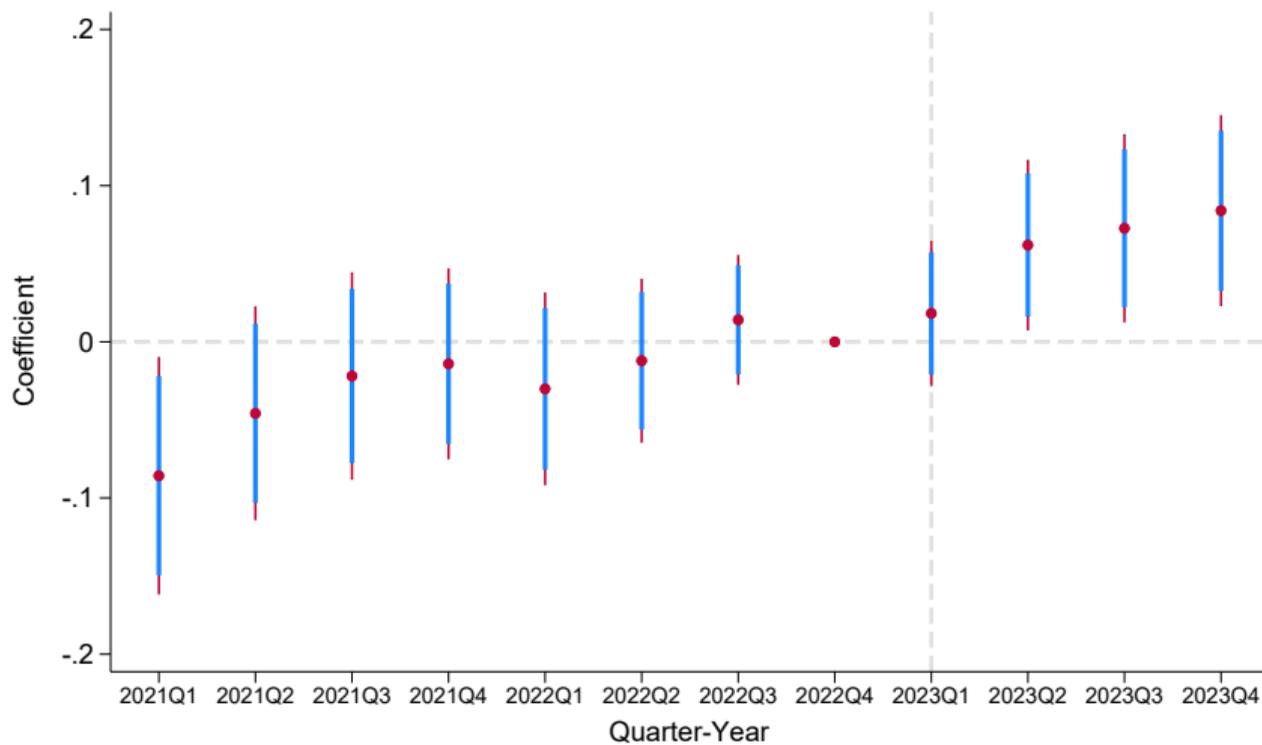


(a) Log(Total Deposits)



(b) Deposit Rate

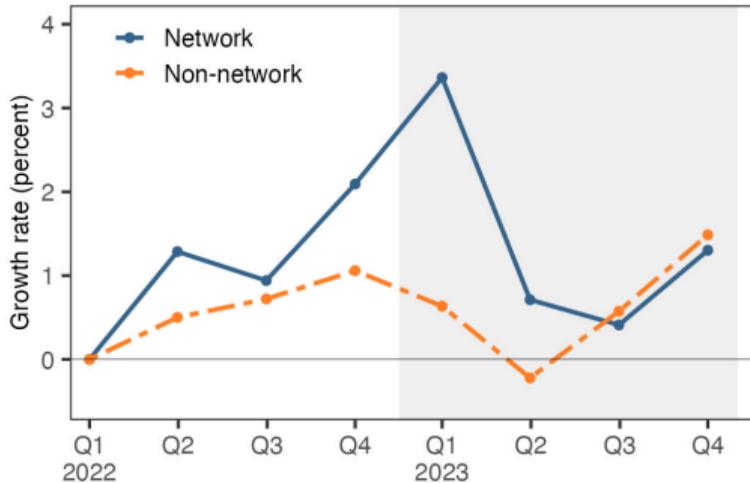
Dynamic effects on bank risk



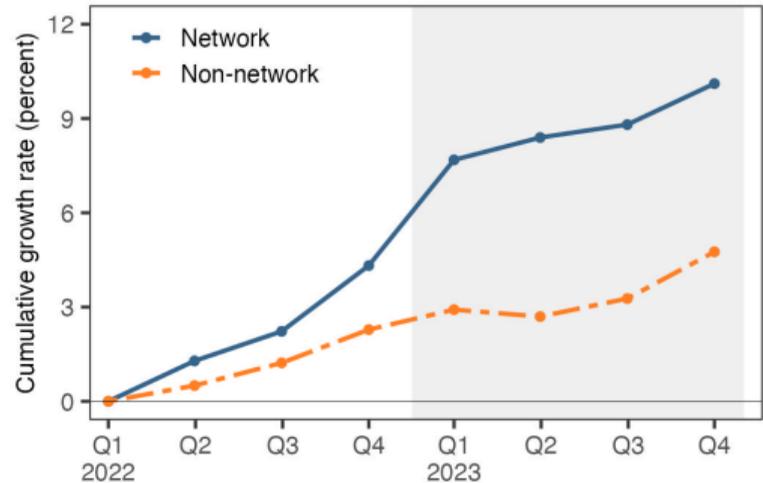
IV. 10 OF THE BANKING MARKET

IO of the banking market

Reciprocal deposit market may reduce the value of TBTF guarantees – allows regional and small banks to retain depositors



(a) Quarterly Growth (%)



(b) Cumulative Growth (%)

Network banks grew larger following the SVB crisis

ln(Assets)	(1)	(2)	(3)
Switcher \times Post	0.0382*** (0.0040)	0.0153*** (0.0041)	0.0155*** (0.0042)
Controls (exc. Size)		✓	
Controls (inc. Size)			✓
Bank FE	✓	✓	✓
Quarter-Year FE	✓	✓	✓
<i>N</i>	23,962	23,962	23,962
<i>R</i> ²	0.9976	0.9977	0.9977

Network banks increased their local market share

Δ Market Share	(1)	(2)	(3)	(4)
Network _{2022Q4}	0.0022 ^{***} (0.0004)	0.0021 ^{***} (0.0004)	0.0021 ^{***} (0.0004)	0.0017 ^{***} (0.0004)
ln(Assets) _{2022Q4}		-0.0004 ^{***} (0.0001)	-0.0004 ^{***} (0.0001)	-0.0003 ^{***} (0.0001)
ROA _{2022Q4}			-0.0054 ^{***} (0.0015)	-0.0058 ^{***} (0.0015)
Securities/Assets _{2022Q4}				-0.0002 ^{***} (0.0000)
Zip Code FE	✓	✓	✓	✓
N	55,968	55,968	55,968	55,968
R ²	0.2472	0.2476	0.2479	0.2489

Network as a substitute to TBTF guarantee

	(1) Mega Share	(2) Big Share	(3) Moderate Share
Zip Network Share ₂₀₂₂ × Post	0.0023 (0.0015)	0.0561*** (0.0066)	-0.0577*** (0.0068)
Post	-0.0018*** (0.0005)	-0.0054*** (0.0007)	0.0065*** (0.0007)
Zip Code FE	✓	✓	✓
N	36,048	36,048	36,048
R ²	0.9896	0.9766	0.9877

- Big banks (assets between \$50 billion and \$1 trillion) increased market share in areas with more big banks on network
- Access to insurance can limit the implicit guarantee advantage of the largest banks

CONCLUSION

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What are the economic implications of a market-based deposit insurance program?

1. First comprehensive analysis of the reciprocal insurance market
 - Small and midsize banks utilize reciprocal deposits
 - Network banks are geographically dispersed

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What are the economic implications of a market-based deposit insurance program?

1. First comprehensive analysis of the reciprocal insurance market
 - Small and midsize banks utilize reciprocal deposits
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2. Causal effect of deposit insurance using network and the 2023 banking crisis
 - **Financial Stability**: Depositors are less likely to withdraw from network banks
 - **Moral Hazard**: Network banks grow – inflows are invested in assets with higher interest rate risk

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What are the economic implications of a market-based deposit insurance program?

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 - Small and midsize banks utilize reciprocal deposits
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2. Causal effect of deposit insurance using network and the 2023 banking crisis
 - **Financial Stability**: Depositors are less likely to withdraw from network banks
 - **Moral Hazard**: Network banks grow – inflows are invested in assets with higher interest rate risk
3. Implications for bank risk-taking, competitive structure of banking, and optimal design of deposit insurance

Contribution [▶ Back](#)

- Economic benefits of deposit insurance:** Iyer and Puri (2012); Martin, Puri and Ufier (2017); Iyer, Puri, and Ryan (2016); Calomiris and Jaremski (2018); Iyer, Jensen, Johannsen and Sheridan (2019); Jaremski and Sprick Schuster (2024)
 - First study on implications of market-based arrangement for deposit insurance, exploiting cross-sectional differences in access to deposit insurance
 - Document effects of deposit insurance on the industrial organization of the banking sector
- Mixed evidence on economic costs of deposit insurance:** Wheelock and Wilson (1994); Karels and McCletchy (1999); Martinez-Peria, M. S., & Schmukler (2001); Demirguc-Kunt and Detragiache (2002); Demirguc-Kunt and Huizinga (2004); Wagster (2007); Acharya (2009); Ionnidou and Penas (2010); Calomiris and Chen (2022)
 - Show that banks with enhanced deposit insurance coverage take on greater interest rate risk
- Causes and consequences of regional banking crisis of 2023:** Jiang, Matvos Piskorski, and Seru (2023); Meiselman, Nagel, and Purnanandam (2023); Chang, Cheng, and Hong (2023); Cookson, Fox, Gil-Bazo, Imbet, Schiller (2023); Granja (2023); Granja, Jiang, Matvos, Piskorski, and Seru (2024)
- Deposit insurance pricing:** Merton (1977); Marcus and Shaked (1984); d'Avernas, Eisfeldt, Huang, Stanton, Wallace (2023); Pennacchi (1987); Kim and Rezende (2023); Egan, Hortacsu, and Matvos (2017)
 - Show that banks' supply of insured deposits is not perfectly elastic

Effect on deposit quantities

	(1)	(2)	(3)	(4)
	ln(Ins. Dep.)	ln(Tot. Dep.)	ln(Ins. Dep.)	ln(Tot. Dep.)
Switcher \times Post	0.0734*** (0.0071)	0.0373*** (0.0042)	0.0485*** (0.0073)	0.0164*** (0.0044)
Controls			✓	✓
Bank FE	✓	✓	✓	✓
Quarter-Year FE	✓	✓	✓	✓
<i>N</i>	23,962	23,962	23,962	23,962
<i>R</i> ²	0.9957	0.9972	0.9959	0.9973

Effect on deposit prices

	(1) Dep. Rate	(2) ln(Time Dep.)	(3) Dep. Rate	(4) ln(Time Dep.)
Switcher \times Post	-0.1468*** (0.0551)	0.1162*** (0.0142)	-0.1060* (0.0596)	0.0438*** (0.0150)
Controls			✓	✓
Bank FE	✓	✓	✓	✓
Quarter-Year FE	✓	✓	✓	✓
N	16,932	16,932	16,932	16,932
R^2	0.7471	0.9827	0.7485	0.9837

Effect on bank risk

	(1) ln(Securities)	(2) ln(Sec.>15Y)	(3) ln(Maturity)	(4) ln(Abs. MatGap)
Switcher \times Post	0.0388*** (0.0102)	0.0484** (0.0230)	0.0370*** (0.0110)	0.0830*** (0.0274)
Controls	✓	✓	✓	✓
Bank FE	✓	✓	✓	✓
Quarter-Year FE	✓	✓	✓	✓
<i>N</i>	18,403	18,403	18,403	18,403
<i>R</i> ²	0.9897	0.9805	0.9920	0.9264