

The Economics of Market-Based Deposit Insurance

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Deposit Insurance

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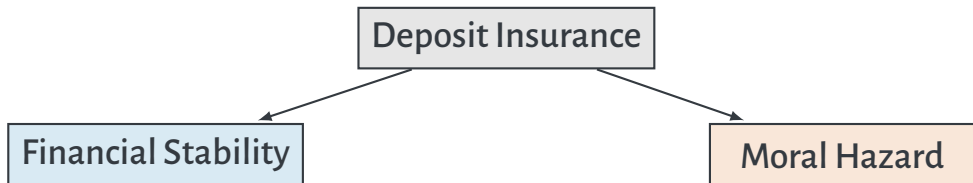
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graph TD; A[Deposit Insurance] --> B[Financial Stability]; A --> C[Moral Hazard];
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Financial Stability

Protects depositors from bank failures, reducing the risk of bank runs

Moral Hazard

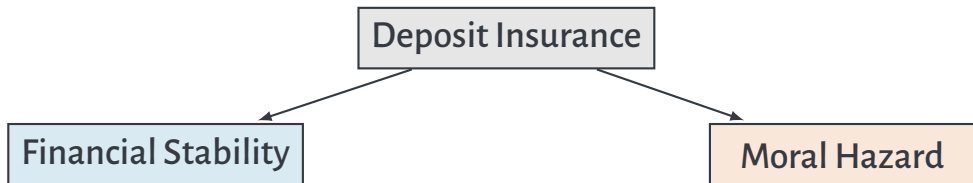
Encourages banks to take on riskier investments, increasing the likelihood of future failures



Protects depositors from bank failures, reducing the risk of bank runs

Encourages banks to take on riskier investments, increasing the likelihood of future failures

(Diamond and Dybvig, 1983; Kane, 1985; Chari and Jagannathan, 1988; Bhattacharya Boot Thakor, 1998; Goldstein and Pauzner, 2005, Merton and Thakor, 2019, ...)



Protects depositors from bank failures, reducing the risk of bank runs

Encourages banks to take on riskier investments, increasing the likelihood of future failures

(Diamond and Dybvig, 1983; Kane, 1985; Chari and Jagannathan, 1988; Bhattacharya and Thakor, 1998; Goldstein and Pauzner, 2005; Merton and Thakor, 2019, ...)

However, causal evidence is limited...

This paper

There *is* variation in deposit insurance coverage across banks:

This paper

There *is* variation in deposit insurance coverage across banks:

Reciprocal Deposits

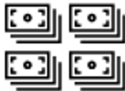
Traditional deposit insurance



\$250K



\$250K, amount insured



Customer



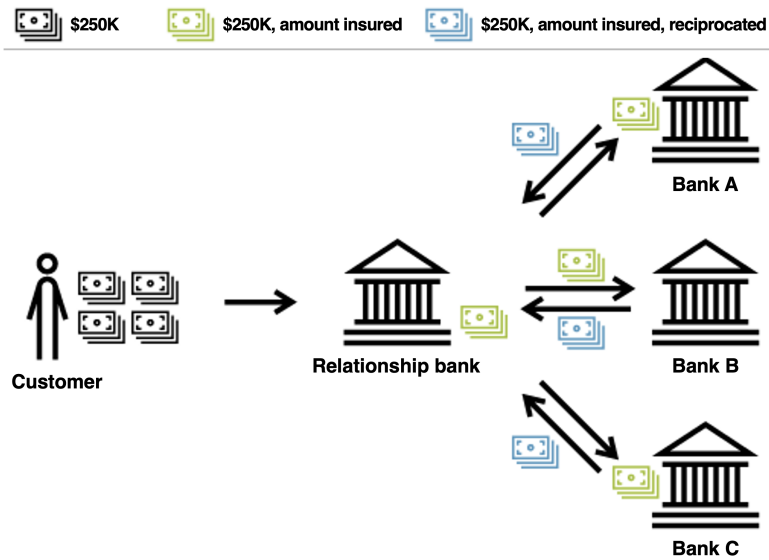
Relationship bank

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



Banking crisis of 2023

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.



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.

US regional banks soothe insurance net

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

Among regional banks advertising high deposit capacity, New York Community Bancorp, which like the former SVB, is a major player. The Beverly Hills, California-based PacWest Bank said because the bank can offer up to \$17 billion in deposits, 700 times the FDIC cap.

Shares of PacWest have plunged more than 50% in its most recent financial filing that said the bank's "reciprocal deposit networks", over 100,000, spread customers' funds in on

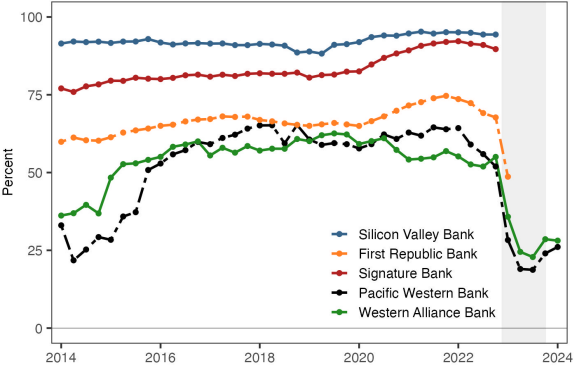
NYCB discloses over \$18.7 bln in reciprocal deposit capacity, shares rise

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.

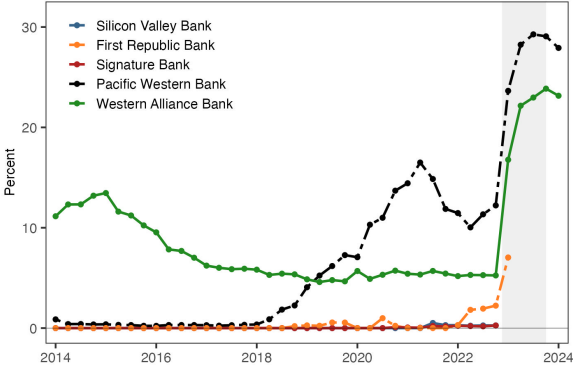
NYCB said if it utilizes the reciprocal deposit capacity, its share of fully insured deposits to total deposits would be 95%.

"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..

Reciprocal deposits and financial stability



(a) Uninsured (%)



(b) Reciprocal (%)

This paper

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

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

This paper

1. Study a new market enabled by financial innovation

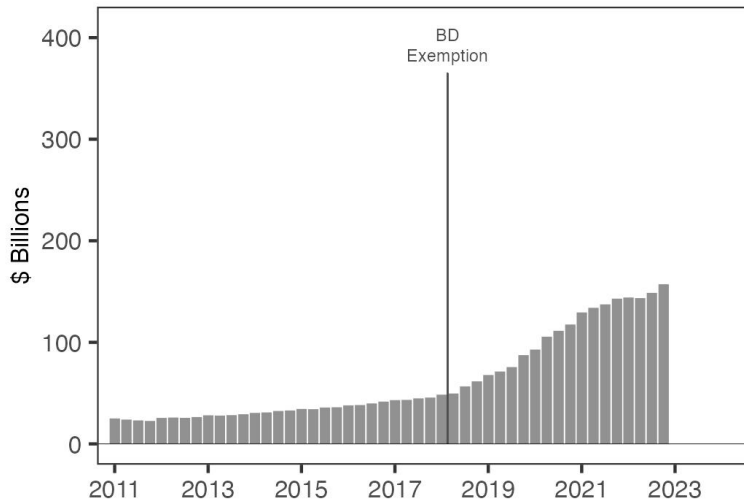
- History and evolution of reciprocal deposits
- Description of key participants

2. Implications of deposit insurance:

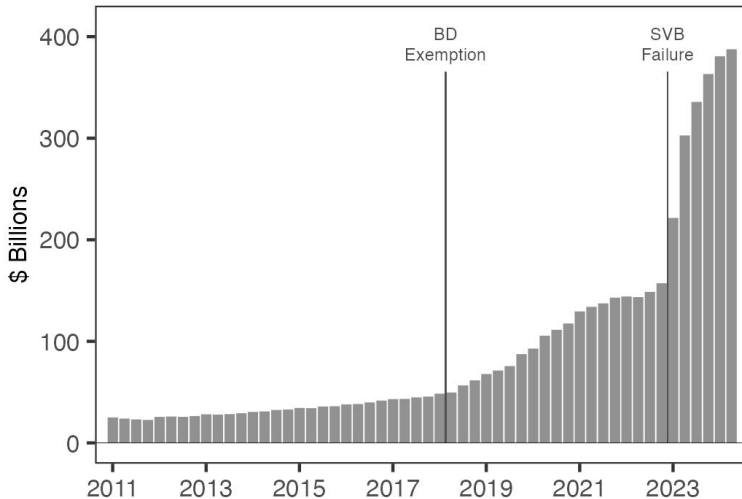
- **Depositors** flow to banks with enhanced insurance during crisis – trace the insured deposit supply curve
- **Banks** with higher insurance coverage hold riskier assets
- **Banking sector** becomes less concentrated – deposit insurance erodes the “too-big-to-fail” advantage of large banks

I. NEW FACTS

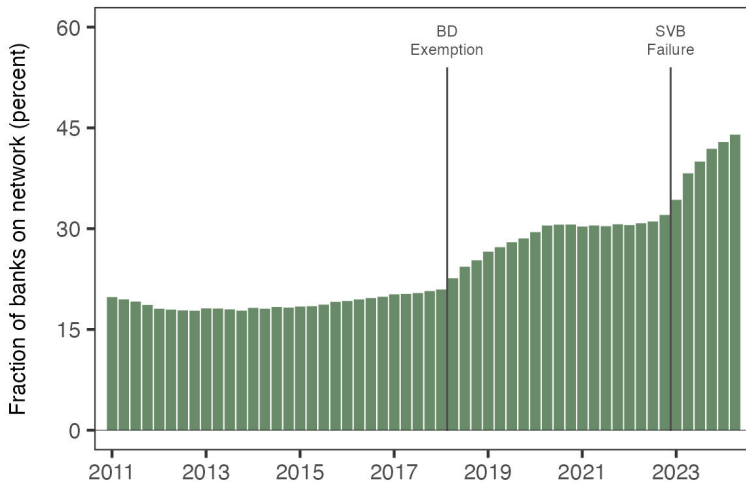
1. Emergence of reciprocal deposits



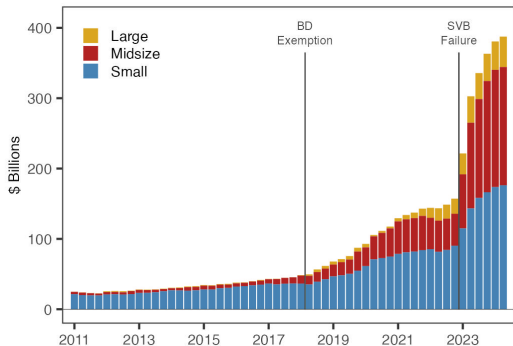
1. Emergence of reciprocal deposits



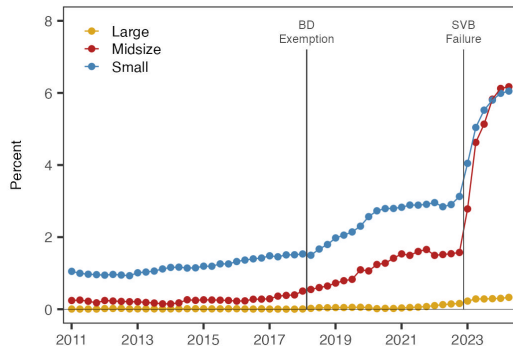
1. Emergence of reciprocal deposits



2. Small and midsize banks use reciprocal deposits

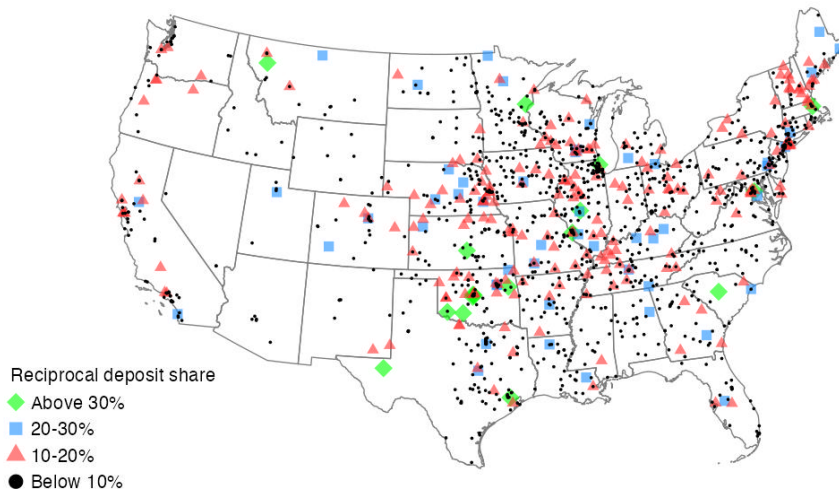


(a) Reciprocal Deposits (\$ bns)



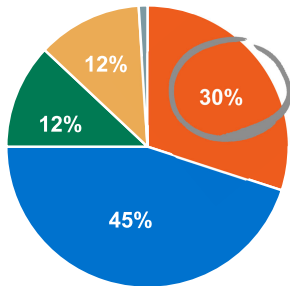
(b) Reciprocal Share (%)

3. Network banks are distributed nationwide (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

Baseline analysis

Our approach: Use bank's presence on the network in 2022Q4

Model

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

Baseline analysis

Our approach: Use bank's presence on the network in 2022Q4

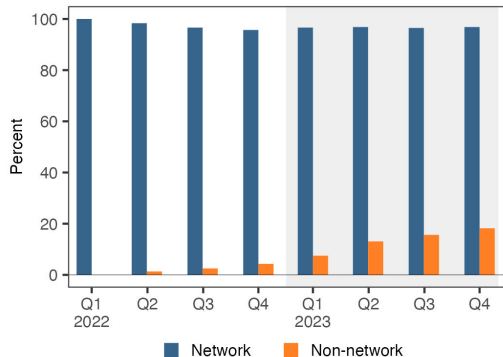
Model

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

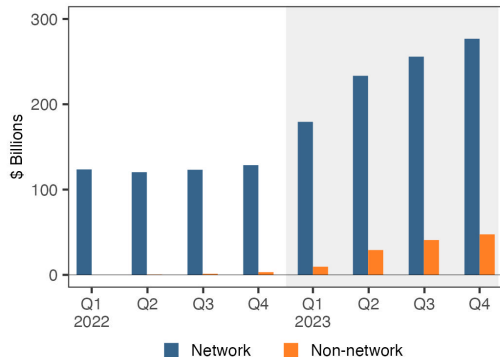
Assumptions:

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

Validation: Frictions to join network



(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

Insured deposits grew at network banks

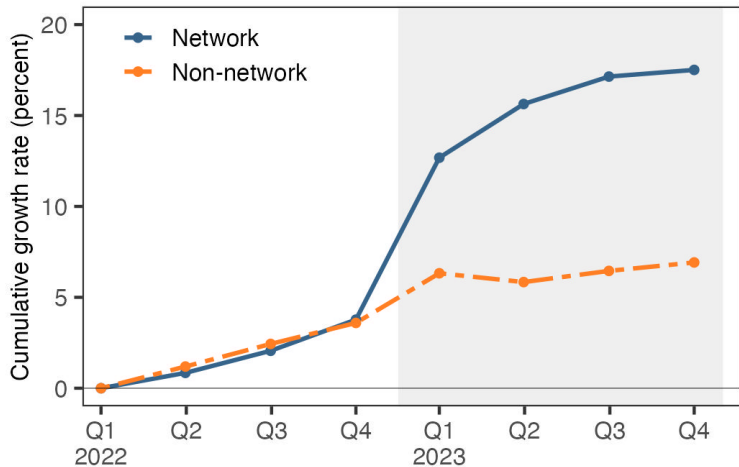


Figure: Insured Deposit Growth

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

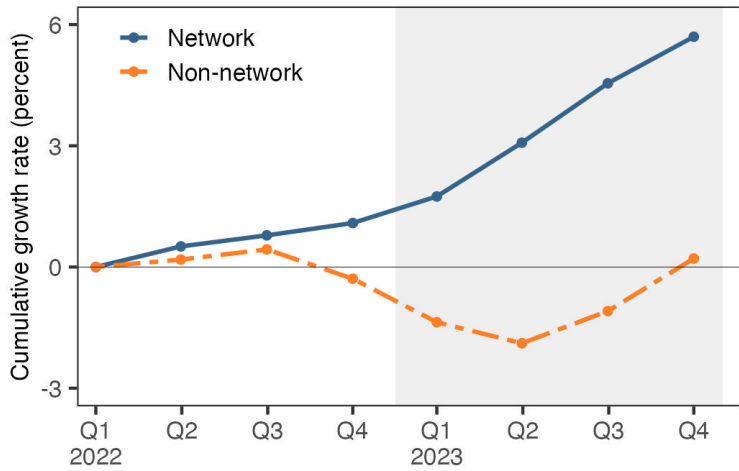
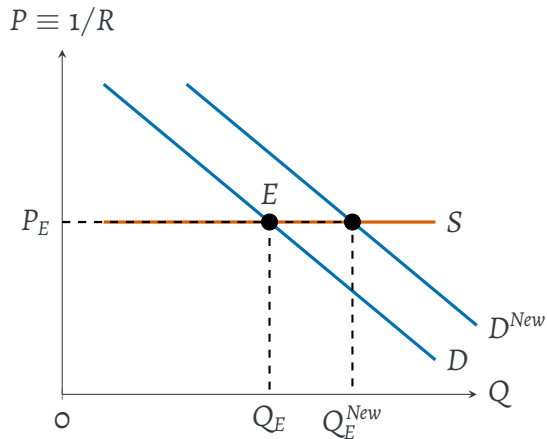


Figure: Total Deposit Growth

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 with elastic supply



e.g., Black, 1970; Fama, 1985; Egan Hortaçsu Matvos, 2017

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}	-0.1633*** (0.0388)	0.1083*** (0.0113)	-0.0869** (0.0426)	0.0406*** (0.0124)
ROA _{2022Q4}			0.2471** (0.1086)	0.0014 (0.0346)
Securities/Assets _{2022Q4}			0.0040** (0.0015)	-0.0021*** (0.0004)
Equity/Assets _{2022Q4}			0.0015 (0.0057)	-0.0045** (0.0019)
$\ln(\text{Assets})_{2022Q4}$			-0.0431*** (0.0146)	0.0446*** (0.0044)
Constant	1.0942*** (0.0232)	0.3285*** (0.0062)	1.4515*** (0.2066)	-0.1384** (0.0618)
Observations	3,379	3,379	3,379	3,379
R ²	0.0051	0.0283	0.0119	0.0811

- 1 bp decrease in the interest rate is associated with 0.47 pp increase in the quantity of CDs supplied

Bank behavior: Interest rate risk

	(1)	(2)	(3)
	$\Delta \ln(\text{Securities})$	$\Delta \ln(\text{Maturity})$	$\mathbb{1}[\text{Increase MatGap}]$
Network _{2022Q4}	0.0125* (0.0070)	0.0173** (0.0088)	0.0582*** (0.0168)
ROA _{2022Q4}	0.0355* (0.0202)	0.0331 (0.0260)	0.0596** (0.0287)
Equity/Assets _{2022Q4}	-0.0006 (0.0010)	0.0012 (0.0009)	0.0004 (0.0009)
$\ln(\text{Assets})_{2022Q4}$	0.0069*** (0.0026)	0.0193*** (0.0032)	-0.0021 (0.0054)
Constant	-0.1682*** (0.0333)	-0.4134*** (0.0425)	0.5851*** (0.0698)
Observations	4,495	4,495	4,495
R^2	0.0073	0.0162	0.0040

III. IDENTIFICATION

Key identification concerns

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

Key identification concerns

- Our results cannot be explained by **observable differences** in bank size, leverage, profitability, and exposure to interest rate risk
- Possibility of **unobserved differences** between the two groups:
 1. Network banks have **stickier** depositor base
 2. Network banks are **safer** than non-network banks

Identification using a regulatory change

Public entities

- **Examples:** Municipal governments, school districts, fire departments
- Deposits placed at banks must be **collateralized** or **insured**
- States gradually allowed the use of reciprocal deposits for insurance

Identification using a regulatory change

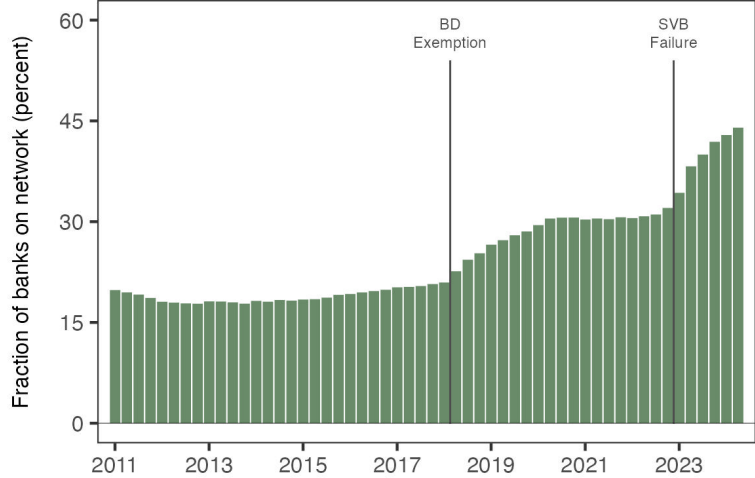
Public entities

- **Examples:** Municipal governments, school districts, fire departments
- Deposits placed at banks must be **collateralized** or **insured**
- States gradually allowed the use of reciprocal deposits for insurance

Brokered deposits exemption (2018)

- Reduced frictions for banks to obtain deposit insurance on large accounts
- Banks that “switched” around this ruling did so for regulatory reasons

Identification using a regulatory change

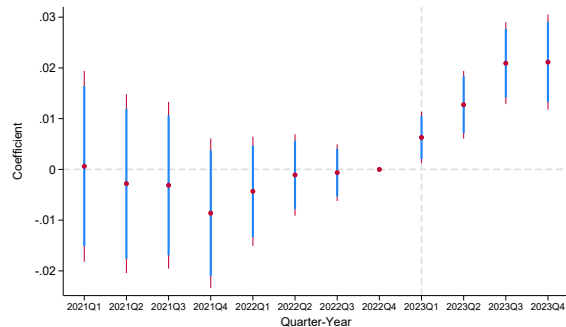


Difference-in-differences design

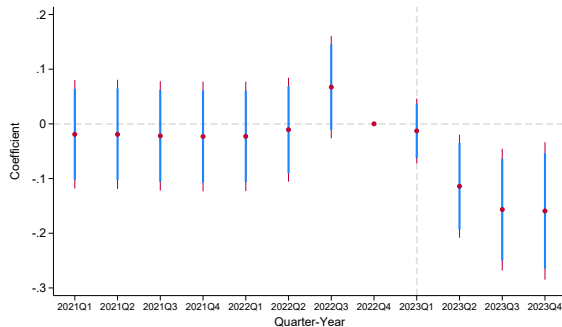
$$Y_{b,q} = \alpha_b + \delta_q + \beta \cdot Switcher_b \times Post_q + \sum \gamma(X_b \times Post_q) + \epsilon_{b,q}$$

- $Y_{b,q}$: 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

Switcher banks: Deposit quantities and prices

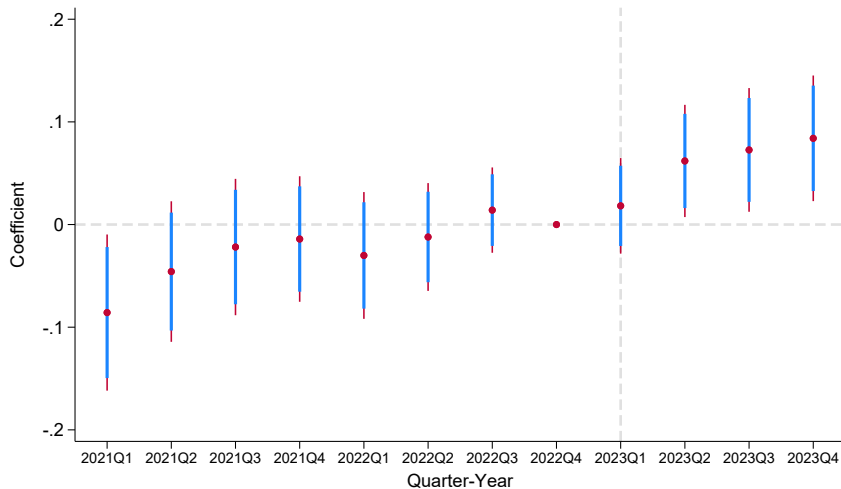


(a) Log(Total Deposits)



(b) Deposit Rate

Switcher banks: Interest rate risk



IV. IO OF THE BANKING MARKET

IO of the banking market

It gives us the opportunity to go after the bigger clients, where in the past they may have been afraid to put their money with us because we weren't a Bank of America Corp. or Wells Fargo & Co.

– Robert Kenney, CFO, Bank of Central Florida (July 2018)

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*We're healthy, we're strong, but you don't even need to believe us because we're going to put you on IntraFi...**Here's an actual guarantee, versus the implicit 'too big to fail' argument for big banks.***

— Jay Tuli, President, Leader Bank (April 2024)

Asset growth at network banks

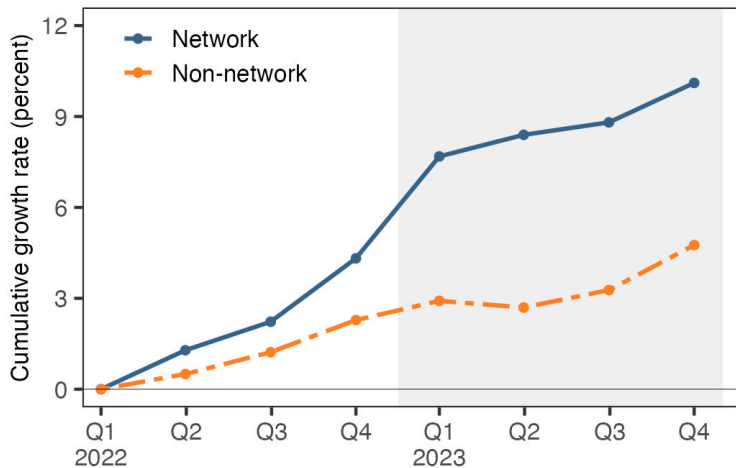


Figure: Total Asset Growth

Network banks increased 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

CONCLUSION

Conclusion

What are the economic implications of deposit insurance?

1. First comprehensive analysis of the reciprocal insurance market

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What are the economic implications of deposit insurance?

1. First comprehensive analysis of the reciprocal insurance market
2. Causal effect of deposit insurance in the modern US banking system
 - Depositors are less likely to withdraw from network banks
 - Network banks grow and invest in riskier assets

Conclusion

What are the economic implications of deposit insurance?

1. First comprehensive analysis of the reciprocal insurance market
2. Causal effect of deposit insurance in the modern US banking system
 - Depositors are less likely to withdraw from network banks
 - Network banks grow and invest in riskier assets
3. Implications for banking sector risk, competitive structure of the banking industry, and optimal design of deposit insurance schemes

Contribution

[▶ Back](#)

1. **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
2. **Mixed evidence on economic costs of deposit insurance:** Wheelock and Wilson (1994); Karels and McClechy (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
3. **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)
4. **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) ln(Ins. Dep.)	(2) ln(Tot. Dep.)	(3) ln(Ins. Dep.)	(4) 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	✓	✓	✓	✓
<i>N</i>	16,932	16,932	16,932	16,932
<i>R</i> 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	✓	✓	✓	✓
N	18,403	18,403	18,403	18,403
R ²	0.9897	0.9805	0.9920	0.9264