Community Banking Research Conference 2024
Where Research and Policy Meet

The Economics of Market-Based Deposit Insurance

Edward T. Kim
Michigan Ross

Shohini Kundu
UCLA Anderson & CEPR

Amiyatosh Purnanandam
Michigan Ross

CSBS SINCE 1902 CONFERENCE OF STATE BANK SUPERVISORS
FDIC

Deposit Insurance

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

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Theoretical literature identifies trade-offs:

1. **Financial Stability**: Protects depositors from bank failures, reducing the risk of bank runs
2. **Moral Hazard**: Encourages 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 it 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”

FT FINANCIAL TIMES

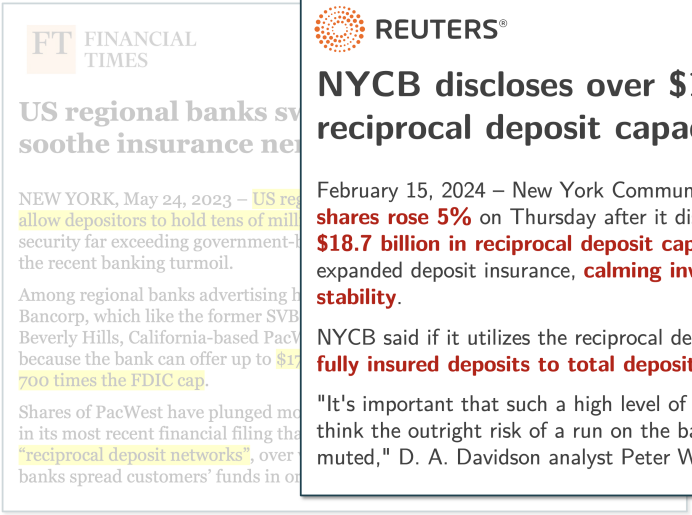
US regional banks swap $220bn in deposits to soothe insurance nerves

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”



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REUTERS®

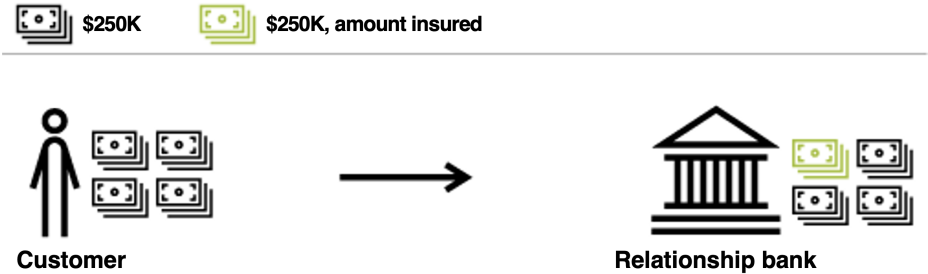
NYCB discloses over $18.7 bln in reciprocal deposit capacity, shares rise

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%**.

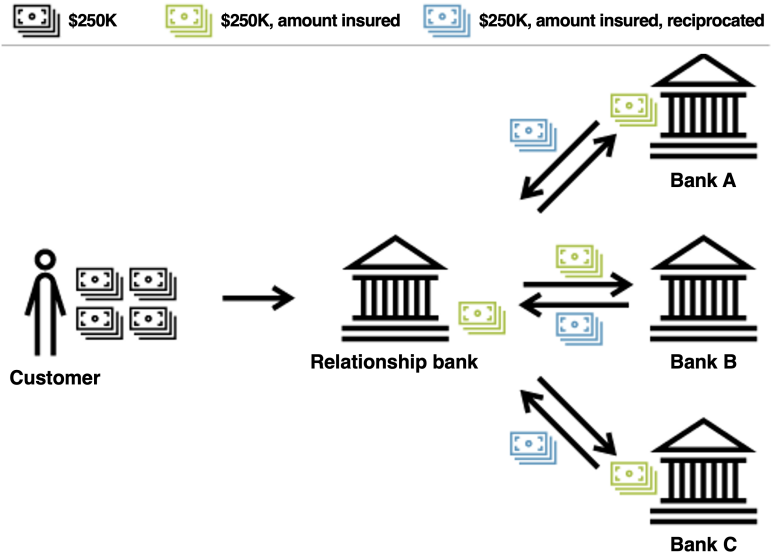
"It's important that such a high level of deposits are insured and I think the outright risk of a run on the bank on deposits is somewhat muted," D. A. Davidson analyst Peter Winter told Reuters..

Traditional Deposit Insurance



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



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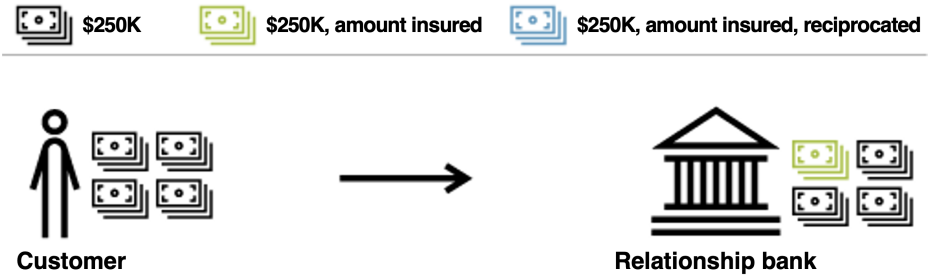

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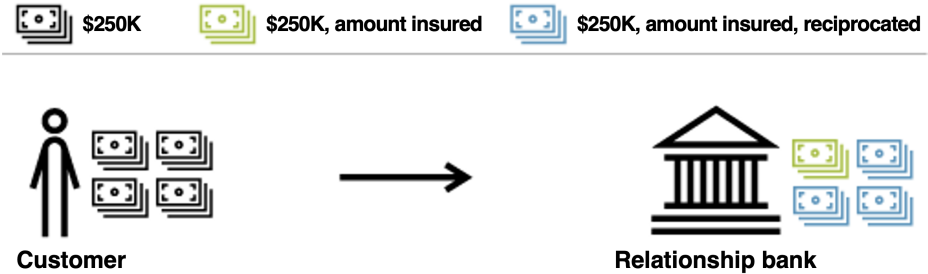

Roadmap

1. **Study a new market enabled by financial innovation**
   - History and evolution of reciprocal deposits
   - Description of key participants

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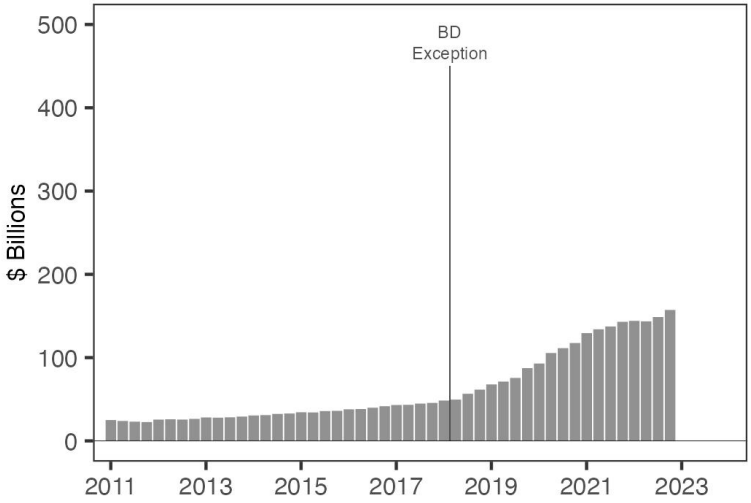
1. **Study a new market enabled by financial innovation**
   - History and evolution of reciprocal deposits
   - Description of key participants

2. **Use the market as an empirical laboratory to address fundamental questions in banking regulation**
   - Financial Stability: Depositors move to banks with enhanced insurance and receive lower interest rates
   - Moral Hazard: Banks with enhanced insurance take on more risk (early)
   - IO of Banking Sector: Banks with enhanced insurance retain market share

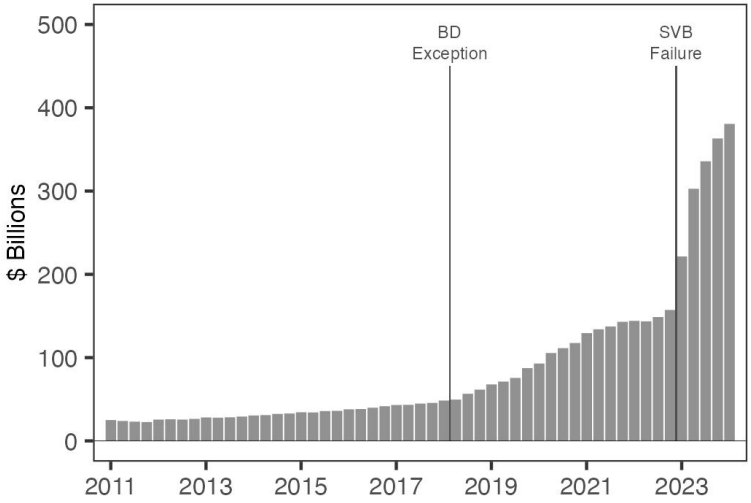
More

I. New Facts

1. Emergence of Reciprocal Deposits



1. Emergence of Reciprocal Deposits



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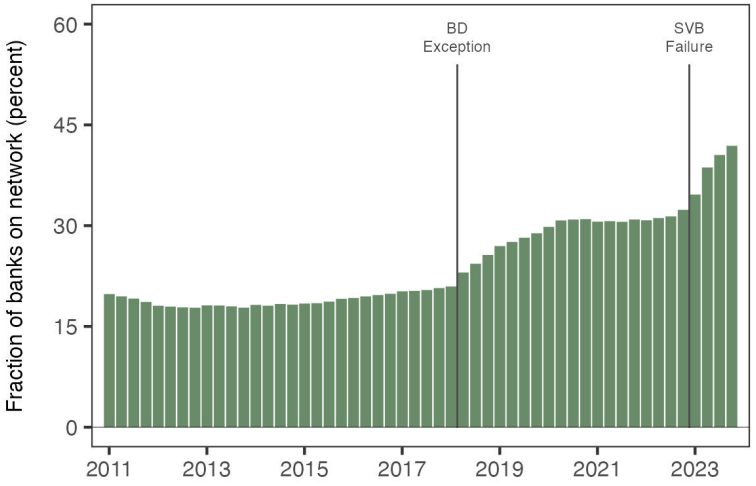
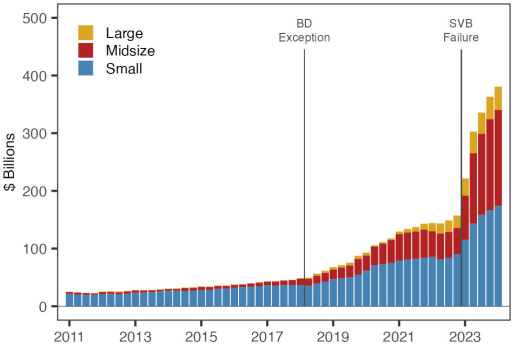
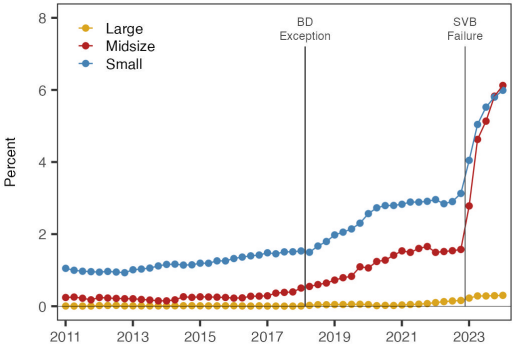


2. Small and midsize banks use reciprocal deposits

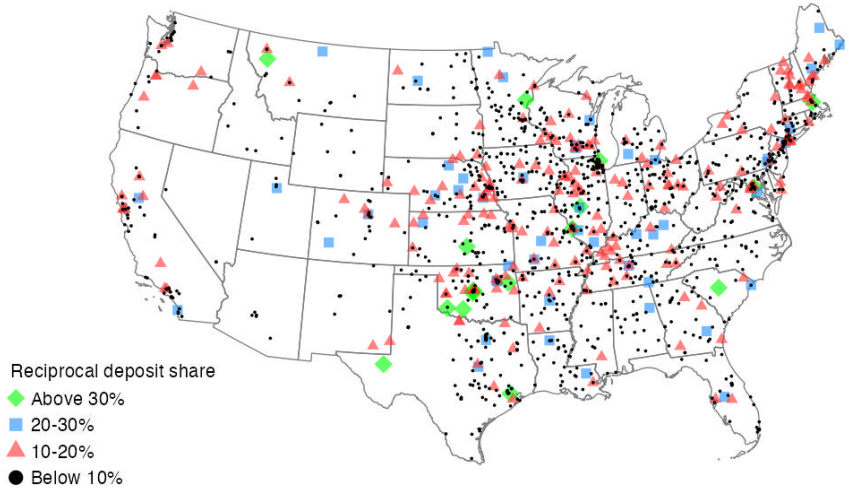


(a) Reciprocal Deposits ($ bns)

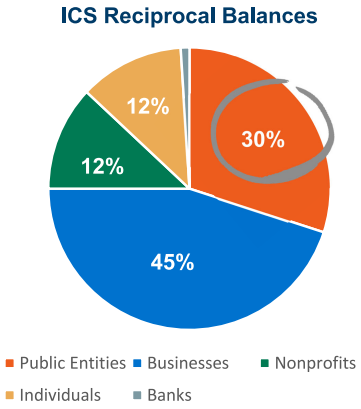


(b) Reciprocal Share (%)

3. Network banks are everywhere (2022Q4)



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



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: Deposit insurance is uniform

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

Model

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

Empirical Design

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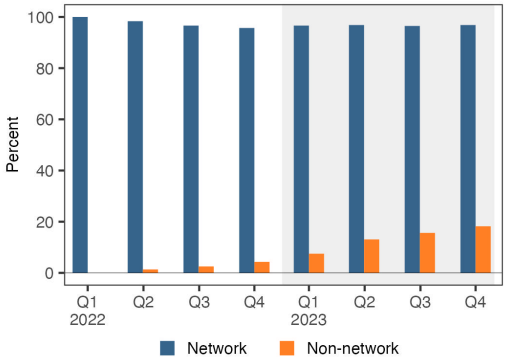
Model

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

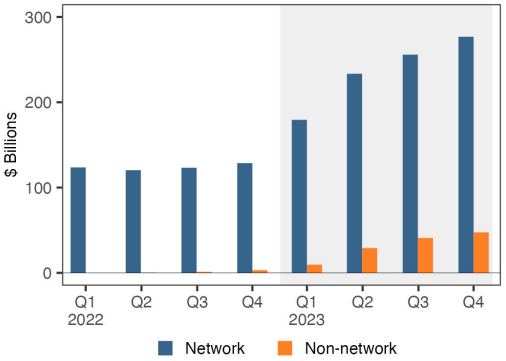
Assumptions:

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

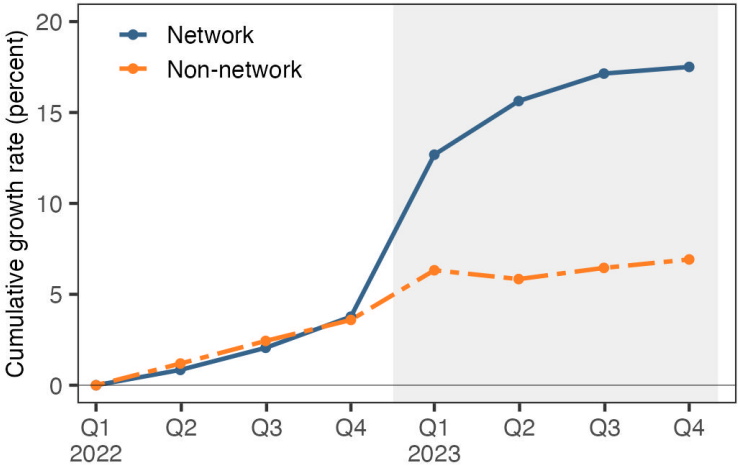


Figure: Insured Deposit Growth

Insured Deposits Grew at Network Banks

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

Network Banks Attracted New Deposits

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

Network Banks Paid Less Interest on Insured Deposits

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

- 1 bp decrease in the interest rate is associated with 0.45 pp increase in the quantity of CDs supplied

Interest Rate Risk

	(1)	(2)	(3)
	Δln(Securities)	Δln(Maturity)	$\mathbb{1}$[Increase MatGap]
Network_{2022Q4}	0.0133*	0.0173**	0.0582***
	(0.0070)	(0.0088)	(0.0168)
ROA_{2022Q4}	0.0507***	0.0331	0.0596**
	(0.0178)	(0.0260)	(0.0287)
$\text{Equity/Assets}_{2022Q4}$	0.0007	0.0012	0.0004
	(0.0005)	(0.0009)	(0.0009)
$\text{ln(Assets)}_{2022Q4}$	0.0060**	0.0193***	-0.0021
	(0.0025)	(0.0032)	(0.0054)
Constant	-0.1728***	-0.4134***	0.5851***
	(0.0324)	(0.0425)	(0.0698)
Observations	4,495	4,495	4,495
R^2	0.0099	0.0162	0.0040

- Network banks took on more interest rate risk with new inflows of deposits

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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- Possibility of **unobserved differences** between the two groups:
  1. Network banks have stickier depositor base
  2. Network banks are safer than non-network banks

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- 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**~~
     $\Rightarrow$ Network banks attracted new deposits

  2. Network banks are safer than non-network banks

Testing the Insurance Access Channel

ln(Dep.)	(2)
Network $\times$ Post $\times \mathbb{1}_{Insured}$	0.0961***
	(0.0120)
Post $\times \mathbb{1}_{Insured}$	0.0822***
	(0.0050)
Bank $\times$ Quarter-Year FE	✓
Bank $\times$ Insured Dep. FE	✓
N	68,056
R^2	0.9952

- 8.22% higher insured deposits after crisis; 9.6% 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**

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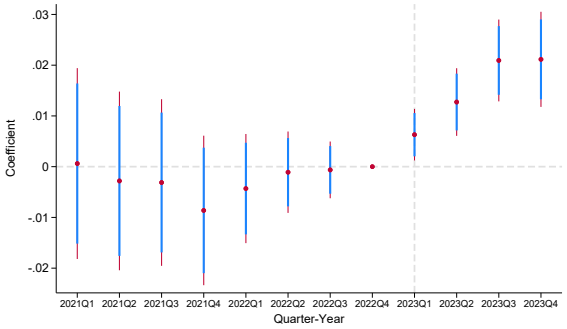
Brokered deposits exemption (2018)

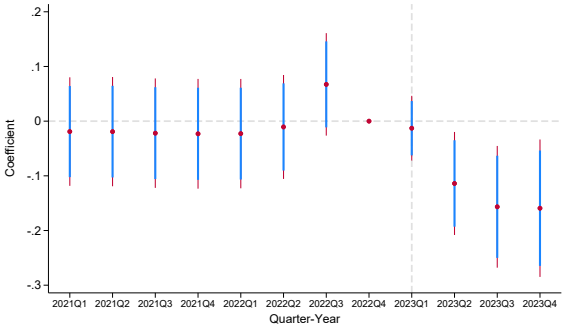
- Reduced frictions for banks to obtain deposit insurance on large accounts
- Banks that "switched" around this ruling did so for regulatory reasons

▸ Difference-in-Differences

Switcher Banks: Deposit Quantities and Prices



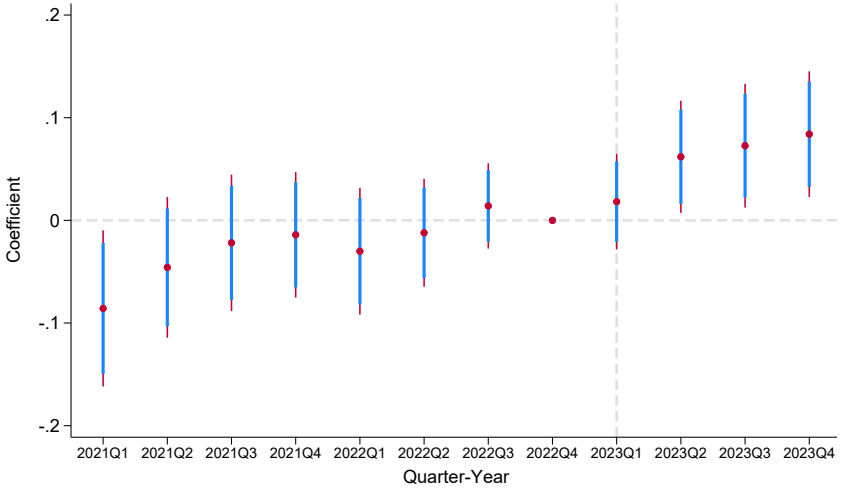
(a) Log(Total Deposits)



(b) Deposit Rate

▸ Regression

Switcher Banks: Interest Rate Risk

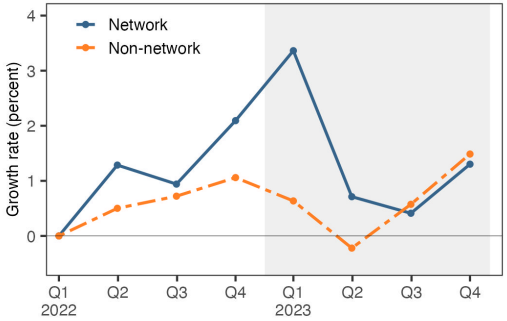


Regression

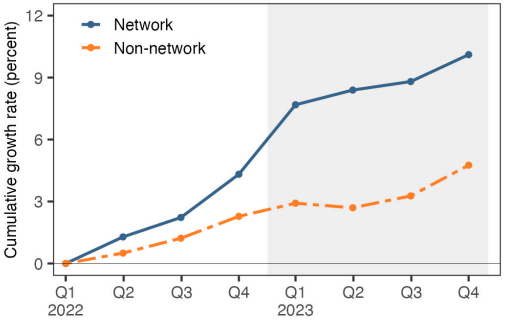
IV. IO of the Banking Market

IO of the banking market

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



(a) Quarterly Growth (%)



(b) Cumulative Growth (%)

Network Banks Increased Local Market Share

Δ Market Share	(1)	(2)	(3)	(4)
Network_{2022Q4}	0.0022***	0.0021***	0.0021***	0.0017***
	(0.0004)	(0.0004)	(0.0004)	(0.0004)
$\ln(\text{Assets})_{2022Q4}$		-0.0004***	-0.0004***	-0.0003***
		(0.0001)	(0.0001)	(0.0001)
ROA_{2022Q4}			-0.0054***	-0.0058***
			(0.0015)	(0.0015)
$\text{Securities/Assets}_{2022Q4}$				-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

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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

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   - 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

Conclusion

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

1. First comprehensive analysis of the reciprocal insurance market

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 insurance as a service, banking competition, and optimal design of deposit insurance scheme

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 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
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

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

Back

Effect on deposit quantities

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

Back

Effect on deposit prices

	(1) Dep. Rate	(2) ln(Time Dep.)	(3) Dep. Rate	(4) ln(Time Dep.)
Switcher × Post	-0.1468***	0.1162***	-0.1060*	0.0438***
	(0.0551)	(0.0142)	(0.0596)	(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

Back

Effect on bank risk

	(1) ln(Securities)	(2) ln(Sec.>15Y)	(3) ln(Maturity)	(4) ln(Abs. MatGap)
Switcher × Post	0.0388***	0.0484**	0.0370***	0.0830***
	(0.0102)	(0.0230)	(0.0110)	(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