The Economics of Network-Based Deposit Insurance

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Abstract

We examine the financial stability implications of deposit insurance using reciprocal deposits, a financial innovation through which banks can break up large deposits and place them with others in an offsetting manner. We show that higher insurance coverage allowed banks to stem deposit outflows during the 2023 banking crisis. Network banks paid lower deposit rates, grew larger, and expanded their local deposit market share, while assuming greater risk exposures. We discuss the trade-offs of deposit insurance and its impact on the banking sector's industrial organization.

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1 Introduction

Using a recent financial innovation called reciprocal deposits, which allows banks to increase deposit insurance coverage beyond the regulatory limit, we ask one of the most fundamental questions in banking: how does access to deposit insurance affect depositor and bank behavior? Most countries around the world use some form of deposit insurance to promote financial stability (Demirgüç-Kunt et al., 2014). The theoretical literature has emphasized two principal trade-offs of this policy tool: improved financial stability and excessive risk-taking incentives of insured banks (Diamond and Dybvig, 1983; Kane, 1985; Bhattacharya et al., 1998; Goldstein and Pauzner, 2005). Despite the theoretical importance and policy relevance of these questions, causal empirical evidence on the effect of deposit insurance coverage on financial and real outcomes remains elusive. Even less is known about the costs and benefits of a network-based deposit insurance program that has become an important source of bank funding in recent years. Our paper attempts to fill this gap in the literature.

The key challenge in evaluating the costs and benefits of deposit insurance is that there is practically no variation in banks' access to insurance coverage. Regulators such as the U.S. Federal Deposit Insurance Corporation (FDIC) set nationwide coverage limits, providing depositors the exact same insurance benefits irrespective of their banking relationships. Consequently, depositors have no preference for banks in terms of how much insurance coverage they can obtain. This lack of variation renders a simple cross-sectional analysis empirically undesirable; any attempt to relate the observed amount of a bank's insured deposits to depositor or bank behavior is fraught with identification challenges. While there have been occasional changes in the coverage limit over time, comparing outcomes across time is also likely to be biased. These changes correlate with attributes such as the strength of the economy and regulation, which can independently affect bank and depositor behavior. A similar identification challenge arises from cross-country analyses, as countries differ in a host of regulatory and economic factors that likely correlate with the structure of their deposit insurance programs (Demirgüç and Kane, 2002).

We study a recent financial innovation in the U.S. banking sector, reciprocal deposits, to overcome this empirical challenge. Banks in the reciprocal deposit network ("network banks") can provide their depositors with higher insurance coverage by splitting large deposits into smaller amounts – each within the FDIC insurance limit of $250,000 – and placing them with other banks in an offsetting reciprocal arrangement. Depositors of participating banks can thus obtain insurance coverage on the entirety of their deposits through this network, irrespective of the amount deposited with their relationship bank. Moreover, the network incorporates an embedded market discipline mechanism as depositors can exclude banks that they do not want to reciprocate with. These features provide valuable insight into the trade-offs of such a system, as countries explore alternative designs for their deposit insurance programs.

Using access to the reciprocal deposit network as a source of variation in insurance coverage during the regional banking crisis of early 2023 (also referred to as the "SVB crisis" after the collapse of Silicon Valley Bank), we study the implications of deposit insurance on depositor and bank behavior. The SVB crisis provides an attractive setting for our study because it amplified depositors' concerns about the safety of their deposits in the banking system (Drechsler et al., 2023; Chang et al., 2023). At the same time, only some banks had access to the reciprocal deposit network at the onset of the crisis due to historical regulatory factors and onboarding frictions. These features enable us to leverage network participation to establish a causal link between enhanced insurance coverage and economic outcomes.

We begin our analysis by providing some key descriptive statistics of this fast-growing, yet relatively unknown, market-based mechanism of insurance coverage. These statistics reveal three stylized facts relating to the time-series evolution of reciprocal deposits, the cross-sectional distribution of network banks, and the characteristics of reciprocal deposit customers.

First, while reciprocal deposits have existed since the early 2000s, they remained a small fraction of total deposits for over a decade, reaching $43 billion in 2017Q4. These deposits gained prominence after a 2018 FDIC ruling that lowered the associated regulatory costs, growing steadily in the subsequent years to $157 billion by 2022Q4. Another significant shift occurred around the SVB crisis in 2023: within two weeks of SVB's collapse in mid-March, reciprocal deposits in the banking system increased by 41% to over $222 billion. These trends, captured in Figures 1 and 2, highlight two key economic drivers of the reciprocal deposit market: regulation and acute concerns about depositor flight.

Second, we find that banks of all sizes hold reciprocal deposits, with small banks (assets below $10 billion) and midsize banks (assets between $10 billion and $100 billion) being much more prominent users. This pattern aligns with the notion that the largest banks benefit from implicit too-big-to-fail guarantees, making them less likely to rely on reciprocal deposits. We also find that participating banks are spread out across the entire U.S. geographically.

Third, the reciprocal deposit base covers high net worth individuals, businesses, and public entities (e.g., municipalities, school districts, public universities, and police departments). Due to regulatory forces, public entities have been some of the earliest and most frequent users of reciprocal deposits: although they represent only about 4% of total deposits in the U.S. banking system, they accounted for about 30% of reciprocal deposits prior to the SVB crisis.

How does access to deposit insurance affect the behavior of depositors and banks? In principle, the reciprocal deposit arrangement can insure the entire deposit base of the banking sector. In practice, however, there are considerable frictions in joining the network, which lead to a delay of six months or more for full operationalization. Motivated by these features of the market, we first use a bank's presence on the network in 2022Q4 – immediately prior to the 2023 banking crisis – as a proxy for access to higher deposit insurance coverage during the crisis. We find that network banks increased their insured deposits by 5.67 percentage points between 2022Q4 and 2023Q4, compared to non-network banks. This was not simply a conversion of uninsured deposits to insured deposits, as the total deposits of network banks also increased by 2.65 percentage points over this period. Moreover, we show that the deposit growth among network banks was driven primarily by the inflow of reciprocal deposits, rather than by unobserved bank characteristics.

Our empirical setting provides insights into theoretical models of banking, their structural estimation, and policy design issues such as deposit insurance pricing, capital structure, and optimal insurance limits (Duffie et al., 2003; Egan et al., 2017, 2022; Pancost and Robatto, 2023; Dávila and Goldstein, 2023). A key parameter of the deposits market is the price elasticity of the deposit supply curve (Black, 1975; Fama, 1985). If banks supply insured deposits perfectly elastically, an increase in the demand for insured deposits should not affect their deposit rates. Contrary to this assumption, we find that the supply curve for insured deposits is not fully elastic. Specifically, we estimate that a 1-basis-point increase in price is associated with a 0.47-percentage-point increase in the quantity of insured certificates of deposit (CDs) supplied by banks, indicating that our findings are driven by demand-based factors.

A key concern with interpreting our results as causal is the non-random selection of banks on the network. It is possible that banks and depositors behaved differently around the 2023 banking crisis due to inherent differences in underlying risk, not variation in access to insurance. We address these endogeneity concerns using two complementary identification strategies.

First, we use the fact that a riskier bank's uninsured deposits would be more vulnerable to runs than its insured deposits (Egan et al., 2017). If network banks are indeed less risky than non-network banks, we can expect stronger growth of insured deposits relative to uninsured deposits at riskier non-network banks following SVB's failure, compared to the corresponding difference at safer network banks. In contrast, if our results are driven by the deposit insurance access channel, insured deposits should grow at a faster rate at network banks. Using a triple-differences model that absorbs differences in time-varying risk across banks, we find that network banks experienced greater growth in insured deposits than in uninsured deposits, ruling out the risk-difference channel.

We further address endogeneity concerns by leveraging plausibly exogenous variation in banks' incentives to join the reciprocal deposit network. Two key regulatory forces shaped the network's development prior to the SVB crisis: state-level regulation that affected the demand for these products and a national regulation that affected their supply. First, state laws require all public funds deposited at banks to be fully insured or collateralized. Before reciprocal deposits, public entities had to open multiple accounts or incur collateral monitoring costs to comply with this requirement. Over the past two decades, states have gradually passed laws allowing reciprocal deposits as a tool to secure insurance coverage for public funds, leading to increased demand for these products. While banks began offering these products in response, many remained reluctant due to a national regulation that classified reciprocal deposits as brokered deposits, which are associated with greater regulatory scrutiny and higher insurance premiums. A 2018 FDIC ruling exempted a capped amount of reciprocal deposits from being classified as brokered, creating incentives for banks to offer these products to public entities and other customers. We exploit this perturbation in banks' incentives to supply reciprocal deposits to establish a causal link between insurance access and economic outcomes.

Our empirical design compares banks with public funds that joined the network around the passage of the brokered deposits exemption – "switcher" banks – to those that did not. This creates two groups of banks that made the decision to join or stay outside the network in response to a regulatory shock, several years before the SVB crisis. At the time of our experiment (during the crisis), switcher status was predetermined by banks' historical decisions. Our identifying assumption is that the FDIC ruling was the primary driver of switcher banks' historical decision to supply reciprocal deposits to their customers, rather than unobserved differences in risk characteristics or depositor base that could influence outcomes years later. If other non-regulatory factors were at play, these banks would have likely joined the network earlier. Moreover, a bank's depositor base or business model was unlikely to change around 2018, a period of relative stability in the banking sector. Finally, we limit our sample to banks with public funds in their deposit base, ensuring that our results are not driven by differences in banks' desire or ability to attract public funds at the time of the FDIC ruling.

In a difference-in-differences setting, we show that switcher banks' total deposits grew by 1.64% during the SVB crisis. Similar to the baseline OLS results, this increase was due to both the retention of existing deposits and the inflow of new insured deposits. Switcher banks' interest rates were 10.79 basis points lower than rates offered by non-switcher banks, suggesting that every 1-basis-point increase in price is associated with a 0.41-percentage-point increase in the quantity of insured deposits supplied by banks. Importantly, these differences cannot be explained by bank size, amount and maturity of security holdings, equity capitalization, public entity deposit balances, or profitability, since we control for the interaction of these characteristics with post-crisis time dummies to absorb the differential effect of these variables throughout the crisis period. The two groups exhibit parallel trends in the amount of insured and total deposits, deposit rates, and maturity gap before the crisis, providing additional support for the validity of our research design. Moreover, we show that the treatment effects for switcher banks are driven by their use of reciprocal deposits. Using a difference-in-differences instrumental variable (DDIV) framework, we find that switcher banks increased their reciprocal deposits, which in turn influenced their overall deposits and interest rates, reinforcing our interpretation of the results. We further confirm that our results are not influenced by the inflow or outflow of public entity deposits, a known driver of network adoption. In fact, our estimates become stronger if we exclude these deposits from the analysis.

How did banks respond to increased deposit inflows arising from enhanced insurance coverage? We focus on measures of interest rate risk – the primary trigger of the SVB crisis (Jiang et al., 2023; Granja, 2023; Granja et al., 2024) – and complement this with evidence on credit risk. First, we find that the amount of total securities and the average maturity of securities at switcher banks increased by 3.88 and 3.70 percentage points, respectively, compared to non-switcher banks. In addition, the asset–liability mismatch, measured by the one-year maturity gap from Purnanandam (2007), widened by 8.30 percentage points. Second, we show that credit default risk also increased at switcher banks. The share of commercial real estate (CRE) loans that are seriously delinquent (90 or more days past due) rose by 0.46 percentage points, while the total stock of delinquent commercial real estate (CRE) loans increased by 1.23 percentage points. These patterns imply that banks with greater deposit insurance access assumed more balance sheet risk as deposits flowed in. Overall, our analysis provides initial evidence of potential moral hazard: greater insurance coverage may weaken market discipline and encourage riskier, less efficient lending behavior. While we cannot determine whether this reflects excessive risk-taking, we provide a critical first step towards assessing the trade-offs of expanded deposit insurance in the context of the modern U.S. banking system.

In the final part of the paper, we study the implications of deposit insurance for the industrial organization of the banking sector, a topic that has largely remained unexplored to our knowledge. The largest banks in an economy often enjoy an implicit guarantee from regulators due to their "too-big-to-fail" status (O'hara and Shaw, 1990; Flannery and Sorescu, 1996; Flannery, 2010; Iyer et al., 2019), resulting in a competitive advantage over smaller banks; indeed, these large banks received significant deposit inflows during the 2023 banking crisis (Cipriani et al., 2024). We show that reciprocal deposits allow smaller banks to compete more effectively by providing greater access to explicit deposit insurance. Specifically, our difference-in-differences analysis shows that switcher banks grew their asset base by 1.55 percentage points after the crisis, with the increase concentrated among small banks with less than $10 billion in assets. Consistent with these asset growth patterns, switcher banks were also able to increase their local deposit market share by 0.52 percentage points.

1.1 Related Literature

This paper relates to the well-established literature on the financial stability role of banks (Diamond and Dybvig, 1983; Kane, 1985; Bhattacharya et al., 1998; Goldstein and Pauzner, 2005). Prior works have also studied different aspects of deposits and deposit insurance, including the effect of deposits on bank value, fair pricing and optimal level of deposit insurance, the effect of deposit insurance on bank portfolio holdings, and the determinants of deposit interest rates (Merton, 1977; Marcus and Shaked, 1984; Ronn and Verma, 1986; Pennacchi, 1987; Chan et al., 1992; Dreyfus et al., 1994; Acharya et al., 2010; Allen et al., 2018; d'Avernas et al., 2023; Kim and Rezende, 2023; Egan et al., 2022; Iyer et al., 2023; Dávila and Goldstein, 2023). We provide novel causal evidence of the stabilizing effect of deposit insurance during a classical banking crisis and discuss its implications for regulation and policy.

From an empirical perspective, our paper expands on previous works that study the causal effects of deposit insurance. Calomiris and Jaremski (2019) and Jaremski and Schuster (2024), the two closest papers to ours, provide important insights into the effect of deposit insurance on financial stability outcomes using historical data prior to the establishment of the FDIC. Our study builds on these works but differs along four key dimensions. First, our paper studies a technology-enabled, market-based mechanism of insurance access, which is fundamentally different from the centralized system in prior studies. Second, it is unclear whether the effect of insurance on depositor and bank behavior would be similar in the modern era featuring new tools for liquidity injections (Carpinelli and Crosignani, 2021) and the expectation of Fed bailouts for large institutions (Flanagan and Purnanandam, 2024). Our paper is of independent interest as the benefits of explicit deposit insurance are not obvious in a world where markets expect implicit guarantees from governments in bad states. Third, due to data limitations, historical studies are unable to estimate the price elasticity of the insured deposit supply curve or its effect on the local market share of banks – outcomes that, to the best of our knowledge, we are able to examine for the first time. Finally, these studies focus on small banks (often unit banks with one branch), whereas our study includes all banks in the economy.[1] Our setting facilitates a sharper analysis of the industrial organization implications of deposit insurance for the banking sector.

This paper is also related to the empirical literature on deposit insurance under modern banking systems around the world (Demirgüç-Kunt and Detragiache, 2002; Ioannidou and Penas, 2010; Iyer and Puri, 2012; Martin et al., 2018; Iyer et al., 2019; Limodio and De Roux, 2023).[2] In general,

[1] Larger institutions tend to face different constraints related to liquidity risk and deposit flow management (Gilje et al., 2016).

[2] Iyer and Puri (2012) and Martin et al. (2018) study the run behavior of depositors at failing or distressed banks. Similarly, Iyer et al. (2019) and Limodio and De Roux (2023) study depositors' responses to implicit too-big-to-fail guarantees in Denmark and blanket insurance expansions in Colombia, respectively.

the empirical evidence in this rich literature either comes from a within-bank setting (i.e., by studying the behavior of different depositor types at a bank) or from programs outside the U.S. Unlike these works, we focus on cross-sectional differences in U.S. banks' access to deposit insurance during a crisis featuring uninsured depositor runs. This setting additionally allows us to estimate the impact of deposit insurance on the competitive landscape of the banking sector.

There is some existing research on reciprocal deposit networks and their relationship with observable bank characteristics. Huberdeau-Reid and Pennacchi (2024) show that riskier banks were more likely to use arrangements such as reciprocal deposits, brokered deposits, and sweep accounts prior to the SVB crisis. Our work is also related to Prescott and Rosenberger (2024) and Ryfe and Saretto (2023), which offer a historical overview of the market's growth and discuss policy considerations around recent developments in deposit insurance. To the best of our knowledge, our study is the first to trace a causal link from the use of these products to depositor and bank behavior.[3]

Lastly, our paper contributes to the ongoing debate on the causes and consequences of the 2023 regional banking crisis (Jiang et al., 2023; Meiselman et al., 2023; Chang et al., 2023; Granja et al., 2024; Cookson et al., 2023; Granja, 2023). We provide novel evidence that banks mitigated depositor flight through reciprocal deposits during the crisis and identify a potential connection between deposit insurance access and banks' risk profiles.

The remainder of the paper is structured as follows. Section 2 describes the key features of the network-based deposit insurance mechanism. Section 3 outlines the data and main sample. Section 4 highlights novel facts on the reciprocal deposits market. Section 5 describes the effect of access to reciprocal deposits during the SVB crisis, while Section 6 provides causal evidence of this relationship in addition to robustness and falsification tests. Section 7 addresses the implications of deposit insurance for the industrial organization of the modern banking sector. Section 8 discusses policy recommendations, and Section 9 concludes.

[3]For additional background, see Shaffer (2012), Shaffer (2013), Li and Shaffer (2015). These papers examine the relationship between various bank metrics and reciprocal deposits during the early stages of the reciprocal deposit market.

2 Institutional Background

The reciprocal deposit market allows banks to offer FDIC insurance coverage that extends beyond the usual limit of $250,000 per depositor. This is accomplished through a network of financial institutions facilitated by an intermediary such as IntraFi. Consider an example where a depositor has $1 million to deposit. She places the entire amount with her relationship bank, which then divides it into smaller portions – for instance, four deposits of $250,000 each – and allocates them to other banks within the network. These recipient banks, in turn, reciprocate by sending an equivalent amount from their large depositors back to the relationship bank. As a result, the entire deposit becomes insured by the FDIC.[4] Prior to the introduction of reciprocal deposits, depositors had to open separate accounts at multiple banks to obtain higher coverage. Reciprocal deposits significantly reduced the frictions associated with this process (e.g., time and set-up costs) while providing the same liquidity and interest-earning properties.[5] More importantly, they allow large depositors such as local businesses and public entities to preserve close relationships with their preferred banks.

The key participants in the network are: (i) the depositor; (ii) the relationship bank; (iii) issuing institutions receiving portions of deposits through reciprocal arrangements; (iv) network providers (e.g., IntraFi); and (v) custodians or independent institutions that maintain the integrity of the network (e.g., Bank of New York Mellon).

While any bank can join and use the network, the process entails considerable time and upfront costs. To begin offering reciprocal deposits, banks must first undergo an onboarding process, which involves signing a contract with a network provider. This step requires setting up internal control frameworks and integrating with the network's platform to ensure smooth communication and transaction processing. There are other setup costs such as training bank branch managers about the product, creating customer awareness, and managing reporting costs and compliance issues such as KYC (Know-Your-Customer) verification. For banks not already on the network, the onboarding process often takes three to six months, or even longer based on our conversations

[4] For more details, visit: https://www.intrafinetworkdeposits.com/how-it-works/. Reciprocal deposits are available both for demand deposits and certificates of deposits; Intrafi's products are referred to as ICS (Insured Cash Sweep) and CDARS (Certificate of Deposit Account Registry Service).

[5] Many network banks advertise these benefits in their promotional material; see an example here: https://www.cbhou.com/Portals/CentralBankHouston/PDF/ICS_CDARS.pdf.

with industry experts. These frictions can inhibit the swift adoption of network-based deposit insurance.

To maintain transparency and control, all depositors sign a deposit placement agreement with the relationship bank that authorizes the distribution of funds to issuing institutions. The agreement additionally allows depositors to exclude specific banks if they wish, and our conversations with industry professionals suggest that this exclusion option is frequently used. As a result, there is an inherent component of market discipline in reciprocal deposits; even if depositors can achieve full insurance, they might be reluctant to deposit their money in struggling banks due to liquidity reasons or reputational concerns. Another critical aspect of reciprocal deposits is rate management. If participating banks offer different interest rates, they enter into a "rate-bridge" agreement. This agreement ensures that a network bank offering a higher rate compensates the other bank for the difference, providing depositors with a consistent experience regardless of where their funds are held. Lastly, network providers reserve the right to remove non-compliant or distressed banks at any time.

To summarize, we identify five key institutional features of reciprocal deposit networks: (i) the effective level of insurance that a bank can provide to its depositors can far exceed the FDIC's limit, (ii) joining the network is costly and takes time, (iii) reciprocity introduces market discipline into this mechanism, (iv) the reciprocal deposits market has the potential to enhance the competitiveness of smaller banks that do not have implicit government guarantees, and (v) the product can potentially change the dynamics of bank-borrower relationships in the economy.

3 Data and Descriptive Statistics

3.1 Data Sources and Variable Construction

Reciprocal deposits were classified as brokered deposits until mid-2018. To account for reporting rule changes around this time, we construct a consistent bank-quarter-level series using either the sum of Call Report items $RCONJH83$ and $RCONJH84$ (Total reciprocal deposits, after 2018Q2) or $RCONG803$ (Brokered reciprocal deposits, through 2018Q1). We define network banks as those with positive reciprocal deposits and non-network banks as those with zero reciprocal deposits.

We collect quarterly data on the level and composition of total assets, loans, deposits, equity, and securities from the Call Reports. We construct two additional measures of interest rate risk: (i) the weighted-average maturity of security holdings using the midpoint of each maturity bucket, and (ii) the average maturity gap derived from Purnanandam (2007), which is the absolute value of the difference between short-term assets (loans and leases, securities, and federal funds sold with less than one year remaining until maturity) and short-term liabilities (federal funds purchased and other borrowed money). Since our focus is on risk-taking behavior linked to deposit insurance, we exclude deposits from the maturity gap calculation. Finally, we use the quarterly balance of past due and still accruing commercial real estate loans as our measure of credit risk.

We obtain deposit rate data from the S&P Global's RateWatch database. We focus on the 12-month certificates of deposit with a minimum balance of $10,000 due to its comprehensive coverage. We compile location and deposit holdings information for bank branches using data from the FDIC's Summary of Deposits. To construct a bank-level measure of interest rates, we first calculate the quarterly average CD rate at the branch level and then aggregate across all branches of each bank.

We compile location and deposit holdings data for bank branches using the FDIC's Summary of Deposits to study the implications of deposit insurance for the industrial organization of the banking sector. Specifically, we construct an annual measure of bank-level branch counts, average deposit amounts per branch, and total deposits at the zip code-bank level. We additionally identify the state of incorporation for each bank using the Call Report's Panel of Reporters.

3.2 Sample and Descriptive Statistics

Our full sample covers the period from 2011Q1 to 2024Q3, starting after the deposit insurance limit was permanently raised from $100,000 to $250,000 in July 2010. In our baseline analysis, we trace the outcomes of commercial banks that were in operation between 2022Q4 and 2023Q4.

In 2022Q4, a quarter prior to SVB's failure, our sample consisted of 4,756 banks, of which 1,539 were classified as network banks. Table 1 reports summary statistics of network and non-network banks. On average, network banks tend to be larger than non-network banks, while exhibiting similar profitability. They also exhibit a larger loan portfolio and lower leverage than non-network banks. Importantly, network banks have lower securities holdings and higher duration risk. They also tend to have lower insured deposit ratios, marginally higher reliance on public entity deposits, and larger branch networks than non-network banks. These statistics collectively suggest that operations and investment decisions may have been different between the two groups prior to the crisis. In our baseline analyses, we include specifications that directly control for these covariates.

Figure 3 plots the evolution of eight bank characteristics in the Pre-BDE exemption (2011Q4 and 2017Q4), Pre-SVB failure (2022Q4), and Post-SVB failure (2023Q4) periods. Baseline differences across groups persist; we do not find that the average characteristics and their relationships across the two groups evolve in a notable manner.[6]

4 New Facts on the Reciprocal Deposit Market

We begin our empirical analysis by uncovering several new insights on the reciprocal deposit market. First, reciprocal deposits are a major source of deposit funding for banks today; as of 2024Q3, there are $403 billion in outstanding reciprocal deposit balances, representing 2.1% of total deposits. Figure 1 shows that the initial growth of the market coincides with bank deregulation. Reciprocal deposits were originally classified as brokered deposits, which attract greater regulatory scrutiny and carry higher deposit insurance premiums than core deposits. This changed after the 2018 Economic Growth, Regulatory Relief, and Consumer Protection Act (EGRRCPA), which led to an FDIC rule that exempts reciprocal deposits from being classified as brokered deposits up to a certain limit.[7] The rule made reciprocal deposits a more attractive form of financing, leading to a steady increase in volume around 2018. The total amount of reciprocal deposits increased from $48 billion in the beginning of 2018 to $157 billion by the end of 2022, representing an annual growth rate of around 19%. For comparison, reciprocal deposits grew from $25 billion to $46 billion from 2011 through 2017, representing an annual growth rate of 9%.

Figure 2 addresses whether the increased utilization is driven by existing network banks or new entrants. From 2011 to 2018, the proportion of banks on the network remained steady at around 20%, a number that steadily increased following the 2018 FDIC ruling to 32% by the end of 2022. Following the SVB crisis, network participation rose even further to 42% by the end of 2023, albeit with a marked delay in the first quarter. This aligns with industry insights suggesting

[6]Appendix Table A.3 additionally reports summary statistics of network and non-network banks in 2023Q4.
[7]See the Federal Register for more details.

that onboarding often takes several months. Consequently, banks already on the network had a clear advantage in offering higher insurance limits to depositors in the immediate aftermath of the regional banking crisis.

Second, we show that small banks (assets below $10 billion) and midsize banks (assets between $10 billion and $100 billion) are the primary users of reciprocal deposits. In fact, the market's sustained growth following the 2018 FDIC rule is almost entirely driven by banks in these two groups: the reciprocal deposit share more than doubled for small banks, rising from 1.5% in 2017Q4 to 3.1% in 2022Q4, and quadrupled for midsize banks from 0.4% to 1.6%. After the SVB crisis, these banks exhibited a comparable sharp rise in reciprocal deposits: midsize banks' reciprocal deposit share almost quadrupled to 5.8% by 2023Q4, while small banks' share doubled to 6.0% over the same period. In contrast, the largest banks persistently exhibit low participation in terms of both volume and usage ($39 billion and 0.29% of total deposits, respectively, by 2023Q4). The share of reciprocal deposits to total insured deposits, which more directly measures the usage of reciprocal deposits to obtain higher insurance coverage, is even higher at 9.4% (midsize) and 8.9% (small), as of 2023Q4. These trends suggest that reciprocal deposit usage is not uniform across the bank size distribution. None of the global systemically important banks (G-SIBs) are ranked among the top 8 banks by total amount of reciprocal deposits or share of reciprocal deposits, as shown in Appendix Tables A.1 and A.2. At the margin, smaller banks may value access to deposit insurance more than their larger counterparts, possibly due to the lack of implicit government guarantees.

Third, we document that the reciprocal deposit network provides enhanced insurance for banks nationwide. Figure 4 illustrates the expansion of the reciprocal deposit network from 2011 to 2022. Across both periods, we observe significant dispersion of network banks both geographically and in terms of reciprocal deposit shares. In particular, network banks are not exclusively concentrated in the coastal regions or in the most populous counties. This pattern can be explained by the technology-enabled nature of the providers, which allows banks to easily transact with distant counterparts.[8]

Fourth, we show that businesses, public entities, and nonprofits represent an overwhelming share of the depositor base for reciprocal deposits. Appendix Figure A.4 provides a breakdown of reciprocal deposit balances as of 2021, where these depositor types make up 87% of balances.

[8]See Appendix Figures A.2 and A.3 for a more detailed county- and state-level overview of the network's geographic expansion.

Notably, public entities (e.g., municipalities, school districts) accounted for nearly 30% of all reciprocal deposits despite representing only about 4% of total U.S. deposits (Appendix Figure A.5). This is due to state-level regulations that require public entity deposits to be fully insured or collateralized.

5 Deposit Insurance and the Banking Crisis of 2023

We begin our analysis by relating deposit market outcomes to network status in 2022Q4. This proxy is motivated by a key institutional feature of this market: banks could not immediately join the network once the crisis began in 2023Q1 due to setup frictions. We focus on the period surrounding the regional banking crisis because concerns over deposit safety became prominent for depositors during this period.[9] This allows us to examine the role of deposit insurance during a banking crisis, directly mapping to theoretical models on whether greater access to insurance mitigates depositor flight.

5.1 Depositor Behavior

To assess whether enhanced deposit insurance affects deposit flows, we estimate the following cross-sectional regression model:

$$\Delta ln(Dep_j) = \alpha + \beta \mathbb{1}_{Network,j} + X_j + \epsilon_j, \tag{1}$$

where $\Delta ln(Dep_j)$ measures the log change in insured or total deposits for bank j from 2022Q4 to 2023Q4 and $\mathbb{1}_{Network,j}$ is an indicator for whether a bank is on the network just before the crisis in 2022Q4. As network and non-network banks might differ in ways that can independently influence depositor behavior, we include specifications that control for a set of key characteristics (X_j) in the regression model.

Column (1) of Table 2 suggests that network participation in 2022Q4 is associated with a 7.80 percentage point increase in the growth rate of insured deposits relative to non-network banks. To account for independent forces that could influence deposit growth, such as depositors flocking to safer or larger banks as well as the heightened scrutiny faced by banks exposed to interest rate

[9]Total bank deposits fell by 2.4% immediately following SVB's failure. See: https://www.wsj.com/articles/state-street-schwab-see-deposits-drop-4b0438ac.

risk, column (3) controls for bank size, securities holdings, equity capitalization, and profitability as measured in 2022Q4. Our results remain similar: insured deposits at network banks grew by 5.67 percentage points more than at non-network banks. Considering the average quarterly growth rate of 4.3% for insured deposits across all U.S. banks from 2010 to 2022, the estimated growth of 5.67 to 7.80 percentage points over four quarters is economically significant.

We examine whether the observed increase in insured deposits is merely a reshuffling of previously uninsured deposits into insured status or a broader ability to attract more deposits. Columns (2) and (4) show that total deposits for network banks increased by 3.96 percentage points more than at non-network banks (2.65 percentage points with controls). Taken together, our findings suggest that access to enhanced deposit insurance not only helped banks retain existing deposits but also enabled them to attract new ones, indicating a significant reallocation of deposits across the banking system.[10]

Table 3 shows that the sharp rise in deposits at network banks is overwhelmingly accounted for by reciprocal deposits. In columns (1) and (2), a one-percentage point increase in the reciprocal deposit share is associated with a 0.72 to 0.73 percentage point increase in insured deposit share. Columns (3) and (4) indicate that total deposits also rise, but by a smaller 0.17-0.19 percentage points. Moreover, the regression fit is stronger for insured deposit growth (R-squared of 0.16 to 0.18) than for total deposit growth (R-squared of 0.03 to 0.08). Therefore, the effect of network status on insured deposit growth operates primarily through increased use of reciprocal deposits, supporting our claim that access to expanded deposit insurance – rather than unobserved bank characteristics – led to the increase in deposit inflows.

To further assess the materiality of these flows, we use a scaled measure of deposit growth as the dependent variable in Table 4. This approach mitigates concerns that the growth-rate specifications from Equation (1) may overstate the importance of categories starting from a small base. First, column (2) shows network status is associated with a 3.31 percentage point increase in insured deposits relative to total deposits in 2022Q4, controlling for bank size, securities holdings, capitalization, and profitability. Second, column (4) indicates that insured balances outside the reciprocal deposit program rise by only 0.68 percentage points. Third, if factors other than deposit

[10] In unreported analysis, we show consistent results on the growth of the number of deposit accounts. Appendix Table A.4 further demonstrates that the impact of enhanced insurance coverage on deposit growth is independent of Federal Home Loan Bank borrowing, which grew substantially during the crisis.

insurance drove deposit growth, uninsured balances would also rise. Instead, column (6) reveals an offsetting 0.68 percentage point decline in uninsured deposits. The evidence therefore points to reciprocal deposits as the dominant driver of deposit growth among network banks.

Our cross-sectional regressions provide a snapshot of the differences in depositor behavior at network and non-network banks following SVB's failure. To investigate whether there were pre-existing differences in deposit characteristics and to assess the persistence of these effects, we analyze the time-series dynamics of insured and total deposits. In Figure 5, we aggregate deposit balances and total assets of network and non-network banks defined in 2021Q1 and follow the quarterly growth of each group through 2023Q4.[11] We restrict the sample to small and midsize banks (less than \$100 billion in total assets) to separate out the flight to the largest banks – an effect we independently study in Section 7.[12] Panel (a) shows that both groups experienced similar growth in insured deposits until 2022Q4, after which a sharp divergence occurred. Network banks experienced a 9% increase in insured deposit growth shortly after SVB's failure, compared to non-network banks' 3%. This divergence persisted throughout much of 2023, with network banks showing much higher insured deposit growth rates compared to non-network banks. By 2023Q4, as concerns surrounding the crisis subsided, growth rates between the two groups began to converge. However, the cumulative difference remained significant; panel (b) shows that from 2022Q1 to 2023Q4, insured deposits grew by 17.9% at network banks, compared to 7.1% for non-network banks – a 10.8% gap. This gap highlights the pronounced effect network membership has on insured deposit growth, particularly in times of financial uncertainty.

Panels (c) and (d) of Figure 5 plot the quarterly and cumulative growth of total deposits. Network banks experienced significant deposit inflows compared to non-network banks after the SVB crisis, a difference that persisted until the end of our sample period. In fact, network banks experienced an *increase* in total deposits whereas non-network banks experienced a *decline* following the crisis. This highlights the heterogeneous response of depositors to a sudden shift in the importance of insurance coverage. Banks with access to reciprocal deposits were able to grow their deposits in absolute terms, despite the heightened scrutiny on banking sector risk. We are not aware of any other group of banks, apart from too-big-to-fail banks, that experienced an increase

[11] We fix network status in 2021Q1 due to its persistence; although many non-network banks join the network in 2023, this would bias us towards not finding a meaningful difference in deposit growth.

[12] In unreported analysis, we find that adjusting the size threshold to \$250 billion does not affect these broad patterns.

in their deposit baseat the onset of the crisis.[13] The significant difference in the deposit growth trajectories of network and non-network banks has a notable cumulative impact; as shown in panel (d), network banks had a cumulative deposit growth advantage of 5.5% over non-network banks by the end of 2023.

It is worth pointing out that we observe a divergence for both insured and total deposits throughout the quarter prior to SVB's failure (2022Q3 to 2022Q4). This suggests that depositors' concerns about banking stability may have begun to emerge before the crisis. Finally, we show that growth patterns in total assets are also roughly consistent (Figure 5, panels (e) and (f)). We discuss the implications for banking sector competition in further detail in Section 7.

5.2 Interest Rates on Deposits

Interest rates on deposits are influenced by various factors, including market rates on safe assets, the competitiveness of the banking sector, and the availability of deposit insurance. Theoretically, the interest rates offered on insured deposits should not be sensitive to bank risk. Moreover, if banks supply these deposits elastically, we should not observe differences in interest rates between network and non-network banks in response to an increase in demand for insured deposits. However, if the supply curve is upward-sloping, an increase in the demand for insured deposits would lead to higher prices, i.e., lower deposit interest rates in equilibrium.

Estimating the elasticity of supply for insured deposits, a primitive parameter, has wide-ranging implications for our understanding of how banks compete, the structural modeling of banking markets with banks as deposit suppliers, and policy design issues such as the pricing of deposit insurance (Fama, 1985; Black, 1975; Duffie et al., 2003; Egan et al., 2017, 2022; Pancost and Robatto, 2023; Dávila and Goldstein, 2023). For example, if banks compete in a local market under a Bertrand-Nash equilibrium, they should supply insured deposits elastically, and even a handful of banks can achieve a perfectly competitive equilibrium. On the other hand, if banks differentiate their products by offering varying levels of service and convenience – such as incurring additional costs to maintain a larger network of ATMs – the supply curve may be upward sloping. In that case, we should observe an increase in the price of insured deposits at network banks after the crisis.

[13] In fact, the "flight to safety" to the largest banks is documented from 2023Q1 to 2023Q2, whereas deposit flows to network banks begin in the immediate aftermath of SVB's failure.

We directly address this question by examining interest rates for a specific product: 12-month CDs with a minimum deposit size of $10,000, an amount well below the FDIC insurance limit. These CDs are particularly appealing to risk-averse savers, and real-time interest rates on these products can be obtained precisely from the RateWatch database. The estimation results are provided in Table 5. Column (1) shows that network banks lowered their interest rate by 16 basis points compared to non-network banks around the crisis period. Since our dependent variable is the change in deposit rate for the same product by the same bank, these estimates are not affected by time-invariant bank characteristics such as management style. Column (3) additionally shows that the effect of network status on interest rates cannot be explained by bank size, security holdings, equity capitalization, or profitability. The estimated coefficient remains significant at 9 basis points.

To estimate supply elasticity, we re-run the regression using corresponding time deposit quantities of the same sample of banks. Column (4), the preferred specification with controls, shows that network banks grew their insured deposit base by 4.06 percentage points around the crisis period. The simultaneous increase in deposit quantity and reduction in interest rates suggests that our findings are driven by an upward shift in the demand curve for insured deposits. By relating the two regression coefficients, we estimate the semi-elasticity of the supply curve for insured deposits: for every 1-percentage point increase in insured deposit quantities, banks lower interest rates by approximately 2.14 basis points. These results align with a model in which banks offer differentiated products to depositors and incur higher marginal costs to supply larger quantities of insured deposits.

5.3 Probability of Distress: A Case Study

A key statistic in the banking literature is the sensitivity of a bank's failure probability to an increase in the deposit insurance limit. Dávila and Goldstein (2023) show that this sensitivity is a key statistic for computing the welfare implications of deposit insurance. Since we do not observe actual bank failures due to explicit or implicit government guarantees, it is difficult to precisely compute this measure. However, we make some progress on this front using a case study of five banks that were under distress during the SVB crisis – Silicon Valley Bank, First Republic Bank, Signature Bank, Pacific Western Bank, and Western Alliance Bank.

Of the five banks, the two that survived the initial months (Pacific Western and Western Alliance) were active on the reciprocal deposit network prior to the crisis; by 2022Q4, these two banks had \$4.2 and \$2.8 billion in reciprocal deposits (12.2% and 5.2% of total deposits), respectively, whereas the three failed banks combined only had \$4.6 billion in reciprocal deposits (1.1% of total deposits). Appendix Figure A.1 illustrates the evolution of reciprocal and uninsured deposits at these five banks visually. Importantly, both Pacific Western and Western Alliance significantly increased their usage of reciprocal deposits during the crisis and ultimately survived.[14]

6 Identification

The key endogeneity concern of relating network status to depositor behavior is non-random selection: banks that were on the network just before the SVB crisis may be systematically different from non-network banks in a manner that make them less susceptible to a crisis for reasons independent of deposit insurance coverage. Two economic forces are of particular concern: (i) depositors of network banks could be more sticky during a crisis, and (ii) network banks may be less risky, enabling them to retain and attract more depositors compared to non-network banks.

The ability of network banks to attract new deposits around the crisis, rather than simply retain existing ones, makes the sticky-depositor channel unlikely. Evidence that the increase in insured balances is primarily driven by reciprocal deposit flows further supports the conclusion that the growth is mediated through reciprocal deposits, rather than by confounding factors such as the behavior of sticky depositors (Tables 3 and 4). Lastly, our results cannot be explained by differences in bank size, security holdings, profitability, or capitalization ratios because we directly control for these attributes in our cross-sectional regressions. Consequently, the primary identification concern stems from unobserved heterogeneity in the riskiness of network and non-network banks. We use two complementary empirical strategies to address these concerns.

6.1 Differences Across Insured and Uninsured Deposits

If non-network banks are inherently riskier than network banks, they should experience a greater decline in uninsured deposits than insured deposits relative to the corresponding difference for

[14] In addition to their limited participation in the network, the failures of SVB and First Republic were likely triggered by a combination of higher uninsured deposit shares and outsized deposit portfolios (\$175 billion and \$176 billion in 2022Q4, respectively). See Prescott and Rosenberger (2024) for a detailed discussion of developments during the banking turmoil.

network banks. Egan et al. (2017) show that uninsured deposits are indeed more sensitive to bank risk – as a bank experiences financial distress, it loses uninsured deposits but not insured deposits.[15] During a crisis, when insured deposits are rising throughout the banking sector, the risk-difference channel suggests that (riskier) non-network banks should see a larger increase in insured deposits compared to uninsured deposits. Our access to insurance channel proposes the opposite hypothesis: that (safer) network banks should experience higher insured deposit growth relative to uninsured deposits. We directly test these contrasting predictions using the following triple differences regression model:

$$Y_{b,i,t} = \alpha_{b,t} + \alpha_{i,t} + \alpha_{b,i} + \beta_1 \cdot \mathbb{1}_{Network_b} \times \mathbb{1}_{Post_t} \times \mathbb{1}_{Ins_i} + \epsilon_{b,i,t}. \tag{2}$$

For each bank b in the dataset from 2022Q1 to 2023Q4, we create two observations per quarter – one for the balance of insured deposits and one for uninsured deposits. $Y_{b,i,t}$ measures the log value of deposits of either type i for bank b in quarter t. $\mathbb{1}_{Post_t}$ and $\mathbb{1}_{Ins_i}$ are indicator variables for the period on or after 2023Q1 and for insured deposits, respectively. The inclusion of bank by quarter-year fixed effects ($\alpha_{b,t}$) allows us to estimate the within-bank-time difference across insured and uninsured deposits after soaking away time-varying bank specific factors such as hidden risk or depositor characteristics. In addition, insured deposits by quarter-year fixed effects ($\alpha_{i,t}$) accounts for aggregate time-varying differences between insured and uninsured deposits, while bank by deposit base fixed effects ($\alpha_{b,i}$) controls for permanent differences between insured and uninsured deposits at each bank. The coefficient of interest is on the triple interaction term, β_1, and it measures the effect of network status on the differential increase in insured deposits compared to uninsured deposits after the crisis.

Table 6 presents the estimation results using the full set of double- and triple-interaction terms. In columns (1) and (2), we find a strong positive coefficient on the interaction term $\mathbb{1}_{Post_t} \times \mathbb{1}_{Ins_i}$, implying that insured deposits increased by 8.32% for the average bank following SVB's failure. However, network banks received an even larger inflow of insured deposits. The estimated coefficient of 9.61% in column (3), which includes the most restrictive set of fixed effects, is economically large and statistically significant. This finding is in line with our proposed channel that access to

[15] Figure 1 of Egan et al. (2017) documents the responsiveness of uninsured deposits to bank risk using the example of Citibank and JPMorgan Chase.

greater insurance coverage led to the higher inflow of deposits into network banks.

6.2 Regulatory Incentives

In this section, we exploit a plausibly exogenous variation in banks' incentive to join the reciprocal deposit network arising from historical banking regulation.

6.2.1 Regulation on Public Funds and Brokered Deposits

Public entities – such as local municipalities, school districts, public hospitals, and police departments – have a fiduciary duty to safeguard their public funds and have historically been subject to regulation when depositing funds at a bank. While the details vary across states, there are generally two acceptable methods for investment: collateralization or full deposit insurance coverage. Before the advent of the reciprocal deposit network, many entities chose to pledge collateral, as deposit insurance was capped at $250,000.[16] The introduction of the reciprocal deposit market significantly relaxed this constraint, as banks were no longer required to hold specific collateral for public funds.

While reciprocal deposits can, in principle, help banks attract and retain public funds, they only became a viable solution after states passed legislation allowing public institutions to invest in reciprocal deposits. Appendix Figure A.6 plots state deregulation events over time. Throughout the 2000s and 2010s, all states enacted legislation that recognize reciprocal deposits as a qualified investment vehicle for public funds.[17] As states enacted these laws, public entities were more inclined to deposit funds at banks with reciprocal deposit access since they no longer needed to monitor their collateral requirements.[18] Despite state deregulations, however, the cost of holding reciprocal deposits was still higher than that of core deposits due to their classification as brokered deposits by bank regulators. This is also evident from Figure 2, where banks' network participation did not meaningfully grow from 2011 to 2017, though the fraction of deregulated states grew

[16]In Minnesota, for example, collateralization "involves the depository placing securities it owns within an account in the trust department of a commercial bank or a restricted account at the Federal Reserve, and pledging these securities to the government entity. If the depository fails, the government entity can take the securities pledged to make up for any loss to its deposited funds." See https://www.osa.state.mn.us/media/4zibjp05/depositspublicfunds1102statement.pdf for more details.

[17]For example, Michigan passed relevant laws in 2008 under its section 307 and 308 (https://legislature.mi.gov/documents/2009-2010/billanalysis/House/htm/2009-HLA-4397-3.htm).

[18]See the following quote from the Chairman and CEO of Catskill Hudson Bank, NY: "Our public funds customers appreciate knowing that when they place their funds through [reciprocal deposits], those funds are eligible for FDIC protection beyond $250,000 and earn interest."

from 75% to over 90%. In 2018, the EGRRCPA allowed reciprocal deposits to be treated as core deposits up to a limit (Ryfe and Saretto, 2023), leading many banks to join the network around this time.[19] Therefore, the FDIC ruling provides a perturbation in the incentives to supply reciprocal deposits by banks, a fact that we exploit for our identification.

We compare outcomes of interest during the SVB crisis across banks that joined the network around the 2018 brokered deposits exemption ruling with banks that did not. Our key identifying assumption is that these banks joined primarily due to reduced regulatory costs and not other factors such as hidden risk characteristics or depositor base; banks that found it optimal to join the network for unobserved reasons would have joined it before the passage of the FDIC ruling. This observation provides us with a historical source of variation in network participation that is likely exogenous in nature.

While the rule was passed in 2018, serious discussion began in 2015. We thus limit our sample to non-network banks with at least some amount of public deposits as of 2014Q4 to ensure that we capture a bank's incentive to join the network in response to the FDIC ruling, and not due to any changes in state laws on public funds, a well-known driver of reciprocal deposit usage, around the same time.[20] Banks that joined the network between 2015Q1 and 2020Q2, encompassing the period of policy discussions for the FDIC's brokered deposit exemption, are classified as "switcher" banks and form our treatment group.[21] All remaining banks that did not join the network during this period constitute the control group. Therefore, switchers represent banks that were not on the network before 2015 and joined it after the discussions on FDIC rule change began, whereas non-switchers were not on the network before 2015 and did not join during this period. We analyze their behavior over the period between 2022Q1 to 2023Q4, which starts sufficiently after the implementation of FDIC's brokered deposit exemption rule and precedes the banking crisis. Therefore, at the time of our experiment, i.e., around the crisis period, the switcher status was pre-determined based on a bank's historical decision in response to a regulatory change.

Table 7 presents summary statistics of 555 switcher and 2,605 non-switcher banks as of 2022Q4,

[19] Banks expressed direct concern about the brokered deposit treatment of reciprocal deposits, with several suggesting that the FDIC "eliminate all limits on the acceptance of reciprocal deposits" (https://www.fdic.gov/sites/default/files/2024-03/2018-12-18-notice-sum-h-fr.pdf).

[20] See https://www.federalregister.gov/documents/2016/02/04/2016-01448/assessments for more details on the rulemaking process and the timeline.

[21] Our results are robust to using narrower measurement windows.

immediately prior to the crisis. There are some notable differences between the two groups: switcher banks are larger, have more loans and less securities, and have slightly lower insured deposits. They also have a longer average maturity of securities, a key measure of interest rate risk. Therefore, it is important for our empirical design to control for the independent effects of key differences across these two groups of banks on depositor behavior during the crisis. We estimate the following differences-in-differences regression:

$$Y_{b,q} = \alpha_b + \delta_q + \beta \cdot Switcher_b \times Post_q + \Sigma\gamma(X_b \times Post_q) + \epsilon_{b,q} \tag{3}$$

where $Y_{b,q}$ is the outcome variable for bank b in quarter q, $Post_q$ is equal to one for all quarters starting 2023Q1, and $Switcher_b$ is an indicator variable for whether a bank is a switcher. To account for the independent effects of bank characteristics on post-crisis performance, we include a comprehensive set of 2022Q4 control variables – bank size, securities to total assets ratio, average maturity of security holdings, equity to assets ratio, public entity deposits, and return on assets – along with their interactions with the $Post_q$ indicator. Finally, the model includes bank and quarter-year fixed effects.

Table 8 presents the estimation results. Columns (1) and (2) show that insured and total deposits at switcher banks increased by 4.85 and 1.64 percentage points following SVB's failure, compared to the corresponding changes for non-switchers. In Appendix Table A.5, we subtract public entity deposits from both specifications as a robustness test and find that the point estimates increase. This indicates that our results are not driven by the behavior of public entity depositors, a well-known user of reciprocal deposits. In column (3), we show that switcher banks reduced their interest rates by 10.79 basis points compared to non-switchers. Taken together with column (4), where the corresponding insured time deposits increased by 4.44 percentage points, we estimate that every 1-percentage point increase in insured deposit supply corresponds to a decrease in interest rates of 2.43 basis points. The sign and magnitude of the supply semi-elasticity are broadly consistent with the OLS regression results.

We conduct a parallel trends test to assess whether our results could be driven by pre-trends in the outcome variables. Figure 6 plots the quarterly estimates from the following regression model:

$$Y_{b,q} = \alpha_b + \delta_q + \Sigma\beta^{q-2023Q1} \cdot Switcher_b \times Q_{q-2023Q1} + \Sigma\gamma(X_b \times Post_q) + \epsilon_{b,q}, \tag{4}$$

which estimates a unique coefficient for each quarter q in the sample relative to the reference point of 2023Q1. The dynamics of the estimated coefficient also provides further insights into the reciprocal deposit market as we discuss below.

Panels (a) and (b) provide coefficient estimates for our key outcome variables: total deposits and interest rates on deposits. They confirm that there are no trends in either the total quantity of deposits or its price, across switcher and non-switcher banks prior to the crisis. As shown in Panel (a), the treatment effect steadily increases for the quantity of deposits in the first three quarters of the crisis, after which the differential effect stabilizes. This is consistent with the view that depositors respond to the access to insurance especially during the period of panic. Panel (b) shows that the rate effects take place a quarter after the crisis. Panels (a) and (b) highlight a stark pattern: switcher banks were able to attract more deposits at a lower rate after the SVB crisis.

Panel (c) plots the coefficients for insured deposits only. We find that switcher and non-switcher banks exhibited parallel trends until 2023Q3, but the level of insured deposits began to increase at switcher banks in 2022Q4, i.e., a quarter before SVB's collapse. This uptick, along with the evidence on total deposits, indicates that some uninsured depositors at switcher banks began to move their funds into insured deposits early. Consequently, insured deposits increased without affecting total deposit levels in 2022Q4. When panic set in after SVB's collapse, switcher banks began attracting new external deposits, leading to a corresponding growth in bank size (panel (d)).

6.3 Implications for Risk-Taking

In this section, we assess whether expanded access to deposit insurance induced greater risk-taking by banks. We begin with interest rate risk, which played a central role in the recent banking crisis and was a primary concern for both regulators and market participants. This focus is also motivated by measurement considerations: interest rate risk can be assessed contemporaneously using balance sheet data, such as the maturity structure of assets and liabilities, whereas credit risk typically becomes observable only after a lag, as it materializes through borrower performance.

To quantify interest rate risk, we examine three standard indicators: the size of the securities portfolio, the average duration of securities, and the absolute value of the one-year maturity gap between assets and liabilities. As reported in Table 9, switcher banks increased their securities holdings by 3.88 percentage points following the SVB crisis. Moreover, the average duration of securities and the maturity gap widened by 3.70 and 8.30 percentage points, respectively, indicating a notable increase in banks' exposure to interest rate risk in the aftermath of enhanced deposit insurance access.

We next turn to credit risk, which is harder to measure contemporaneously but offers complementary evidence on banks' overall risk posture. In particular, we focus on CRE loans, a segment that has attracted increasing regulatory concern in recent years due to its sensitivity to economic cycles and interest rate shocks. Table 10 shows that access to enhanced deposit insurance is associated with a deterioration in credit quality: the share of seriously delinquent CRE loans (90+ days past due) relative to total assets rose by 0.38 percentage points at switcher banks, while early-stage delinquencies (30–89 days) remained largely unchanged. The total stock of delinquent CRE loans increased by 1.23 percentage points, pointing to a meaningful decline in credit performance that is concentrated in more severe forms of delinquency. Taken together with the evidence on interest rate exposure, these results suggest that enhanced access to deposit insurance prompted banks to assume greater balance sheet risk across both market and credit dimensions. Importantly, Figure 7 shows no evidence of differential pre-trends, reinforcing the interpretation that these changes reflect post-crisis behavior rather than prior trajectories.

While the magnitudes we document are economically meaningful, they remain modest in the context of banks' overall balance sheets. Moreover, our empirical design cannot definitively establish whether the observed exposures reflect excessive risk-taking. What the evidence does demonstrate is that expanded deposit insurance relaxes funding constraints and is followed by incremental portfolio shifts toward longer-duration securities and a gradual buildup of CRE delinquencies. Whether such rebalancing ultimately undermines systemic resilience depends on how the associated risks are managed. This question lies beyond the scope of our analysis but remains central to ongoing policy discussions about the broader implications of deposit insurance design.

6.4 Validation and Robustness Tests

6.4.1 Exclusion of the Largest Banks

We demonstrate the robustness of our findings by excluding the largest banks with more than $1 trillion in assets. The motivation behind this exercise is to address concerns that special exceptions for large banks may affect our results. For example, soon after the onset of the banking crisis, depositors began to move their money to the largest national banks for safety reasons. Furthermore, some large banks were implicitly and explicitly involved in supporting other distressed banks at the time (for instance, JP Morgan Chase acquired First Republic Bank in March 2023). By excluding the largest banks, we ensure that our results are not driven by these considerations. Appendix Table A.6 shows that our results are robust to the exclusion of the largest banks.

6.4.2 Mediation through Reciprocal Deposits

Thus far, our difference-in-differences results indicate that banks that joined the network around the FDIC brokered deposits exemption attracted more deposits during the crisis and increased their interest rate risk exposure. Are these results mediated through the use of reciprocal deposits, the channel that we propose? We directly answer this question by estimating a difference-in-differences instrumental variables (DDIV) model using $Switcher \times Post$ as an instrument for the use of reciprocal deposits. In this context, the difference-in-differences results correspond to reduced form estimates that link the instrument to the outcome variables.

Column (1) of Table 11 presents the result of the first stage regression with the reciprocal deposits to total assets ratio as the dependent variable. Switcher banks saw an increase of 1.36 percentage points in this ratio following the SVB crisis compared to non-switchers. This is an economically large effect given the unconditional average of 0.8% for all banks and 3.8% for network banks. Moreover, the large F-statistics indicate that our instrument is strong.

Columns (2) to (9) report the second stage estimate for all the outcome variables used in our reduced form difference-in-differences regression model. These regressions provide us with the effect of reciprocal deposits on various outcomes, as instrumented by the $Switcher \times Post$ variable. The results are consistent and statistically significant throughout, implying that the effect of enhanced access to deposit insurance for switcher banks is precisely mediated through an increase in the usage of reciprocal deposits. These findings further alleviate endogeneity concerns that the relationship between network status and our outcomes of interest may be driven by unobserved risk factors or depositor heterogeneity.

7 Deposit Insurance and the Industrial Organization of Banking

Financial innovation in deposit insurance has the potential to reshape the industrial organization of the banking sector by reducing the advantage of the "too-big-to-fail" guarantee enjoyed by the largest banks. Under the traditional insurance design, where a nationwide limit is set for all banks and depositors, smaller banks are at a competitive disadvantage because they do not benefit from implicit guarantees. Reciprocal deposits can mitigate this disadvantage by allowing smaller banks to obtain explicit insurance for their large clients.

At a broader level, our study can shed light on the effect of explicit deposit insurance on the competitive landscape of banking, a topic that has received little attention in the academic literature and policy debates so far. The issue has immediate implications for the pricing of financial products in local markets; if smaller banks can retain depositors through reciprocal deposits, it could significantly impact other aspects of the economy as well. Depositors may build deeper relationships with one bank instead of maintaining multiple banking relationships solely for higher insurance coverage, which could, in turn, influence the volume and types of loans banks can issue.

Understanding the impact of deposit insurance on overall banking market dynamics remains open to empirical investigation. One might argue that access to higher deposit insurance via reciprocal deposits simply redistributes existing liabilities within a bank, leaving its overall asset size unchanged. On the other hand, enhanced insurance access could enable banks to grow through new deposits, which in turn allows them to issue more loans and hold additional securities.

To formally assess the effect of deposit insurance access on asset growth, we employ the difference-in-differences design across switchers and non-switchers as in Equation 3. Table 12 reports the results. Column (1) does not include any bank controls. Column (2) controls for the interactions of securities holdings, maturity of securities portfolio, capitalization, public entity deposits and profitability, measured in 2022Q4, with the *Post* variable. Column (3) adds an additional interaction term between bank size and the *Post* variable. We find that network banks experienced an additional 1.53% to 1.55% growth in assets during this period. These estimates are statistically significant at the 1% level and economically meaningful in light of the average quarterly growth rate of bank assets of 3% between 2010 and 2022.[22]

[22]Our findings are robust across alternative OLS specifications. We do not report these results for brevity.

Next, we examine the heterogeneous effects of deposit insurance access on asset growth by bank size. Specifically, we use Equation 4 to compare the dynamic asset growth estimates for small banks (assets below $10 billion) versus midsize and large banks (assets above $10 billion). Figure 8 shows that the positive impact of switcher status on total assets is primarily driven by small banks in the aftermath of the SVB crisis; while there is a statistically significant and economically meaningful increase in total assets among small switcher banks starting 2023Q1, we do not find the same effect for midsize and large banks. We rigorously test these relationships in Table 12, employing the model specified in Equation 3. Consistent with the visual evidence, small switcher banks experienced a 2.63% to 4.76% increase in total assets following the SVB crisis. These findings, while broadly consistent with utilization patterns by size group in Figure 1, suggest that enhanced deposit insurance disproportionately benefits small banks relative to midsize and large banks.

To supplement these findings, we use micro-level evidence to directly test how enhanced access to deposit insurance impacts banks' local deposit market share. First, we calculate each bank's local market share as the fraction of total zip code level deposits it holds. Since branch-level deposit data is only available annually in June, we compute the share for 2022Q2 and 2023Q2 for each bank in each zip code. We include bank by zip code and zip code by year fixed effects to control for the average bank market share in each code and to absorb the average competitiveness of a zip code in each year. In addition, we include all the control variables measured in 2022Q2 interacted with *Post*, as in the earlier models. Table 13 presents the results. Column (5), our preferred specification, shows that network banks increased their market share by 0.52% following SVB's failure. An increase of half a percentage point in market share at the zip code level is economically meaningful, given the average (median) zip code bank market share of 18% (13%) in our sample.

Collectively, our findings imply that access to insurance can in part reduce the advantage of large banks and improve the competitiveness of small banks. These results are important for policy debates surrounding implicit government guarantees as well as for understanding the effect of deposit insurance on banking market structure.

8 Discussion and Policy Recommendations

Our findings have several important implications for banking regulation. One of the key objectives of the FDIC is to protect small depositors.[23] The growing use of reciprocal deposits impacts this objective by extending deposit insurance coverage for large depositors and altering the scope of protection within the system. Whether this extension is desirable from a social welfare perspective requires a much deeper analysis of costs and benefits of this system, a topic beyond the scope of our work. However, our study raises at least two immediate policy questions.

First, the FDIC may need to reconsider its deposit insurance pricing scheme, as it effectively insures a larger pool of deposits due to reciprocal arrangements. It should assess whether to adjust insurance premiums to account for reciprocal deposit usage, given their potential to increase the FDIC's overall liability. Second, we contribute to current discussions on whether to raise the deposit insurance limit. While our findings are suggestive of overall demand for increased deposit insurance coverage, we leave rigorous quantification of the optimal insurance limit, motivated recently by Dávila and Goldstein (2023), to future work.

Precise answers to these questions depend on the various trade-offs highlighted in our paper. For instance, network providers actively monitor their networks and retain the right to remove participant banks for stability concerns. Similarly, depositors can ask to exclude banks they do not find creditworthy. Reciprocal deposits, therefore, introduce a combination of regulatory insurance and market discipline – a blanket increase in the insurance limit would diminish the market discipline mechanism inherent in reciprocal deposits.

Our main finding that reciprocal deposits promote financial stability for distressed banks demonstrates the clear benefit of deposit insurance. As shown in Appendix Figure A.1, troubled banks that were active on the network during the recent crisis increased their use of reciprocal deposits and were able to continue operations. However, reciprocal deposit networks also increase interconnectedness in the banking system: since network banks are exposed to distant counterparties, a disruption in one segment could potentially lead to broader contagion. Policymakers must therefore carefully weigh these risks against the stability benefits when considering alternative

[23] See https://www.fdic.gov/analysis/options-deposit-insurance-reform: "Protecting small depositors, who hold most of the deposit accounts, has been an objective of the deposit insurance system since its founding."

designs.[24]

Our results also have implications for antitrust and competition. Reciprocal deposit networks reduce the too-big-to-fail advantage enjoyed by the largest banks, potentially limiting the implicit bailout guarantees these banks receive. However, smaller banks may face reduced incentives to compete when exchanging deposits within the reciprocal network. Whether these competitive forces ultimately enhance welfare for depositors and borrowers remains an open question.

Lastly, our study highlights the significance of disclosure in the context of financial innovations like reciprocal deposit networks. During a crisis, network banks associated with a failing partner institution may face elevated withdrawal risks, even if the deposits are insured. This can occur, for instance, due to depositors' concerns about liquidity. Precise information on network structures and the state of uninsured deposit concentration can help policymakers formulate better resolution plans during a crisis.

9 Conclusion

A common feature of deposit insurance programs worldwide is that regulators set a national insurance limit, providing the same level of insurance to each depositor at a bank. This uniformity leaves little room for banks to enhance their clients' insurance coverage. A recent financial innovation – reciprocal deposits – has disrupted this system, allowing banks to offer significantly higher insurance coverage without requiring depositors to open multiple accounts with other institutions. In this paper, we study the economic implications of network-based deposit insurance.

While an extensive literature exists on traditional deposit insurance programs, our understanding of reciprocal provisioning of deposit insurance is limited. As there is no theoretical limit to the amount of deposits that can be insured under this new system, our setting is useful to study the positive and negative effects of deposit insurance. On the one hand, enhanced deposit insurance could serve as a strong deterrent against depositor runs during times of instability. On the other hand, it could encourage banks to take on greater risks. Moreover, the emergence of a network-based system may alter the industrial organization of the banking sector by reducing the implicit too-big-to-fail guarantees that the largest banks typically enjoy. Finally, this system

[24] See

may change the dynamics of bank-client relationships, as larger clients no longer need to maintain multiple banking relationships to increase insurance coverage. Consequently, network-based deposit insurance may have significant long-term implications for the economy.

Collectively, our results suggest that network-based deposit insurance can be an effective tool for containing depositor runs but may also have lasting consequences for risk-taking and the competitive structure of the banking industry. While a comprehensive evaluation of policy issues and welfare effects is beyond the scope of this paper, we offer a starting point for improving the design and implementation of deposit insurance programs going forward.

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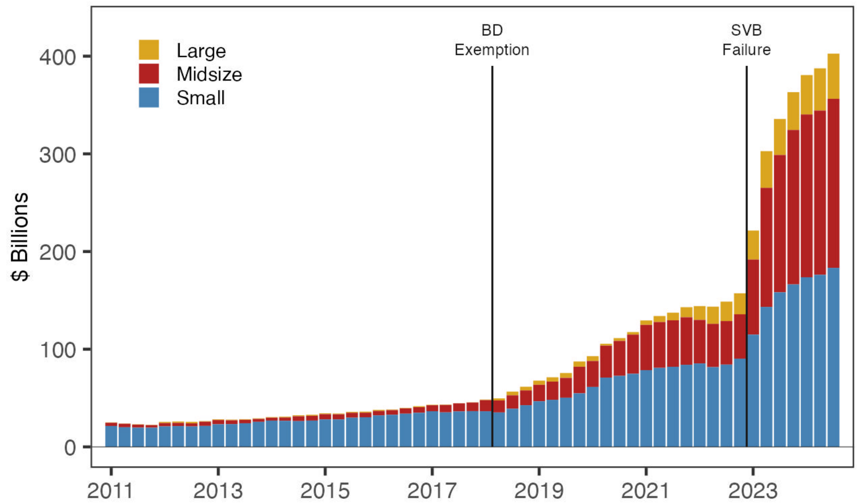
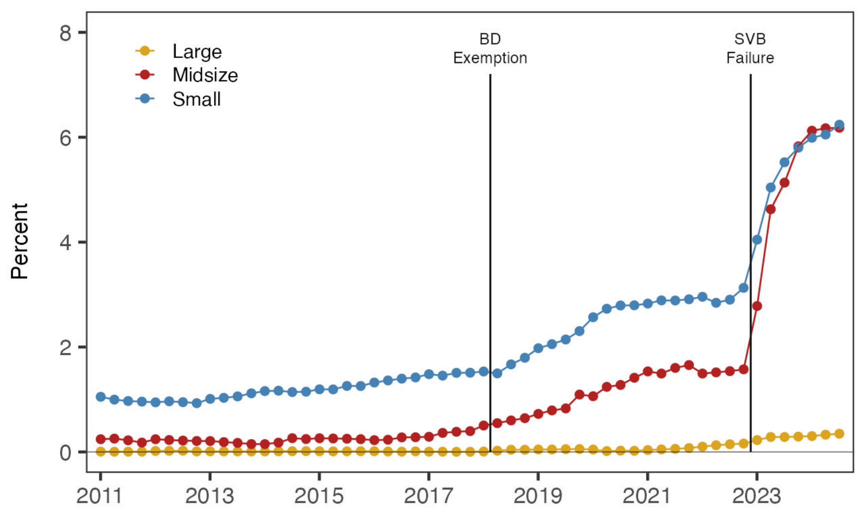
Figure 1: Reciprocal Deposits in the U.S. Banking System

(a) Reciprocal Deposits by Volume



(b) Reciprocal Deposits to Total Deposits

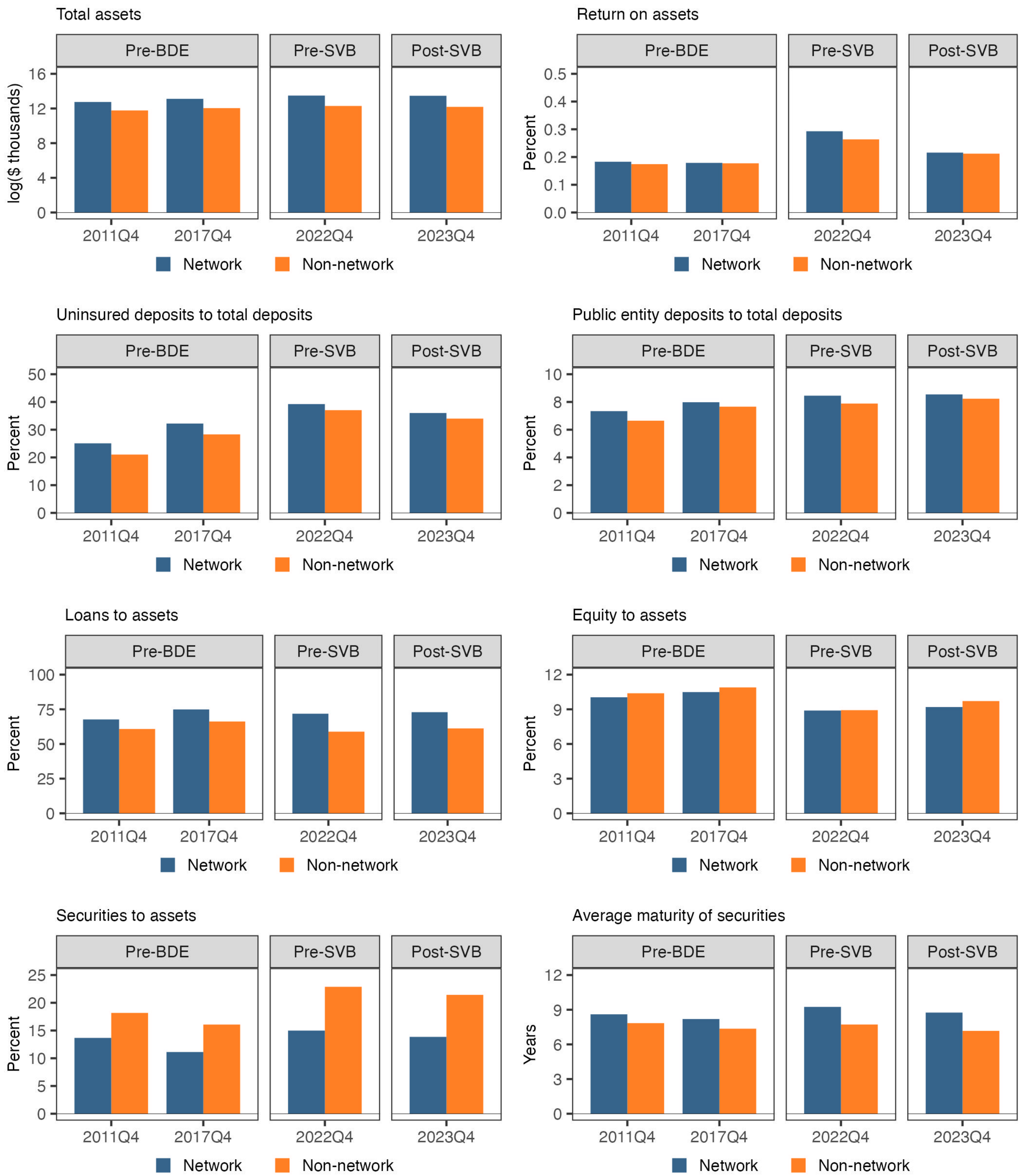


Notes: This figure plots the evolution of reciprocal deposits between 2010Q1 and 2024Q3, both in terms of volume (top panel) and as a share of total deposits (bottom panel). "Large," "Midsize," and "Small" banks refer to banks with more than \$100 billion in assets, between \$10 billion and \$100 billion in assets, and less than \$10 billion in assets, respectively. "BD Exemption" signifies when the EGRRCPA exempted a capped amount of reciprocal deposits from being treated as brokered deposits, and "SVB Failure" marks the start of the 2023 regional banking crisis.
Source: Call Reports.

Figure 2: Evolution of the Reciprocal Deposit Network

Notes: This figure plots the share of banks with positive reciprocal deposits ("network banks") between 2010Q1 and 2024Q3. "BD Exemption" signifies when the EGRRCPA exempted a capped amount of reciprocal deposits from being treated as brokered deposits, and "SVB Failure" marks the start of the 2023 regional banking crisis.
Source: Call Reports.

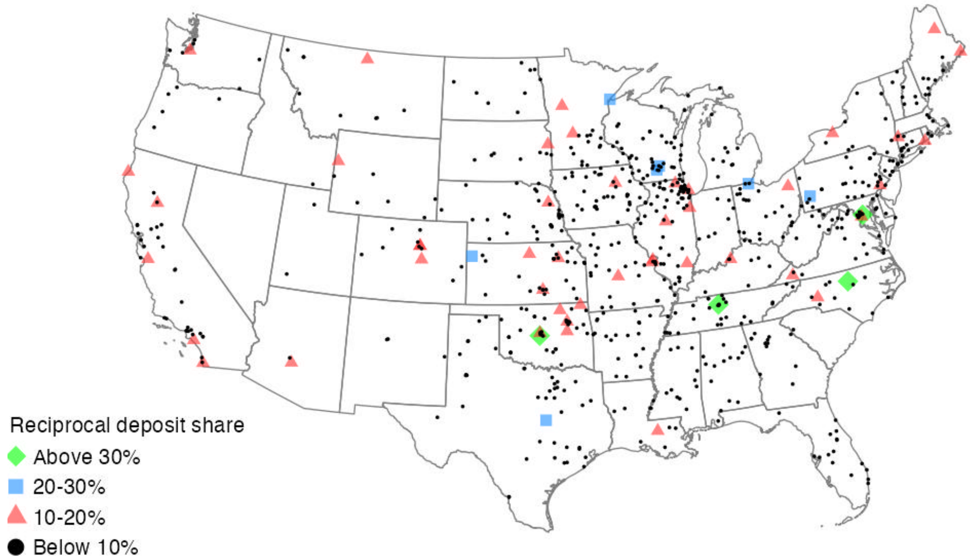
Figure 3: Network Status and Bank Characteristics



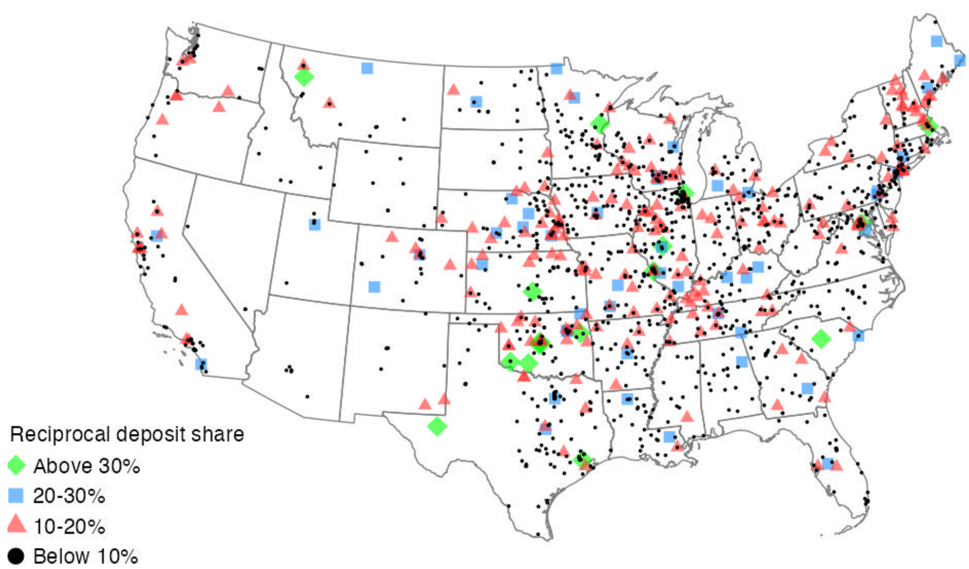
Notes: This figure plots the median of eight characteristics of network and non-network banks in 2011Q4 and 2017Q4 (prior to the FDIC's brokered deposit rule), 2022Q4 (pre-SVB crisis), and 2023Q4 (post-SVB crisis). The sample includes small and midsize banks (less than $100 billion in assets) that were active between 2011Q1 and 2023Q4.
Source: Call Reports.

Figure 4: Geographic Expansion of Reciprocal Deposits

(a) 2011Q4

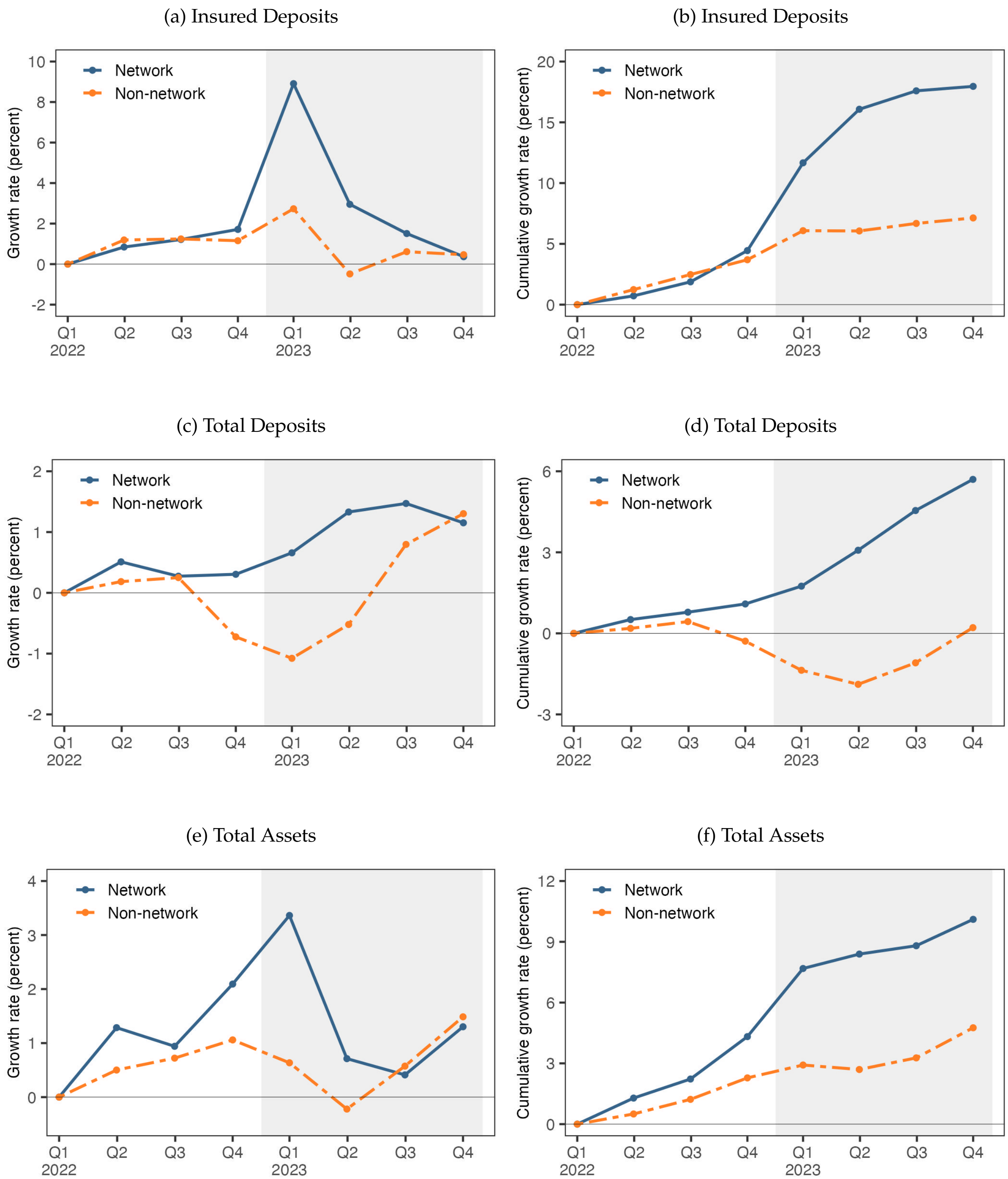


(b) 2022Q4



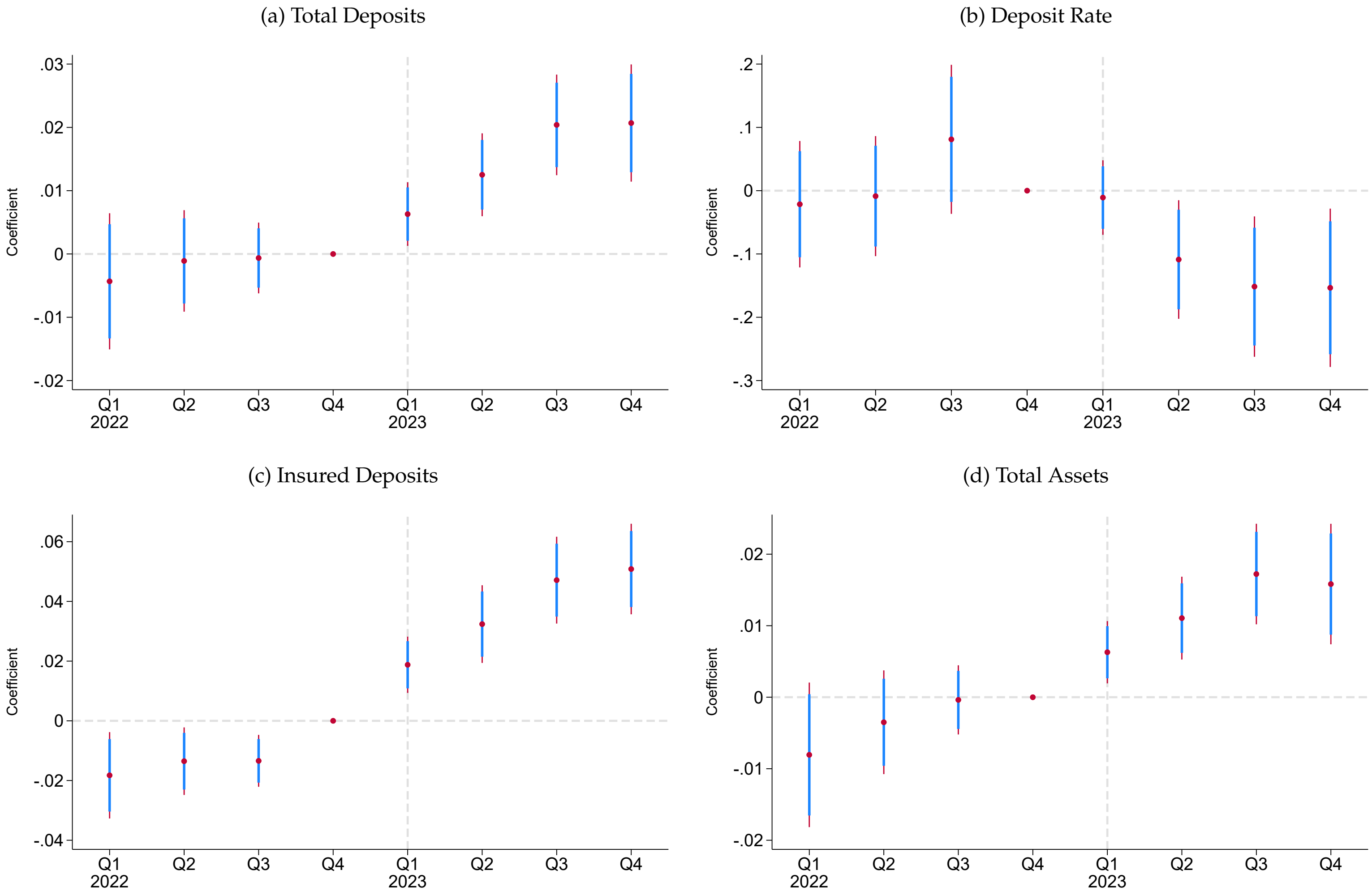
Notes: This figure plots the expansion of network banks between 2011Q4 and 2022Q4, organized by each bank's reliance on reciprocal deposits. Network banks are defined as those with positive reciprocal deposits. Each point corresponds to the location of a bank's headquarters and represents the reciprocal deposits to total deposits ratio (percent).
Source: Call Reports.

Figure 5: Deposit and Asset Growth by Network Status



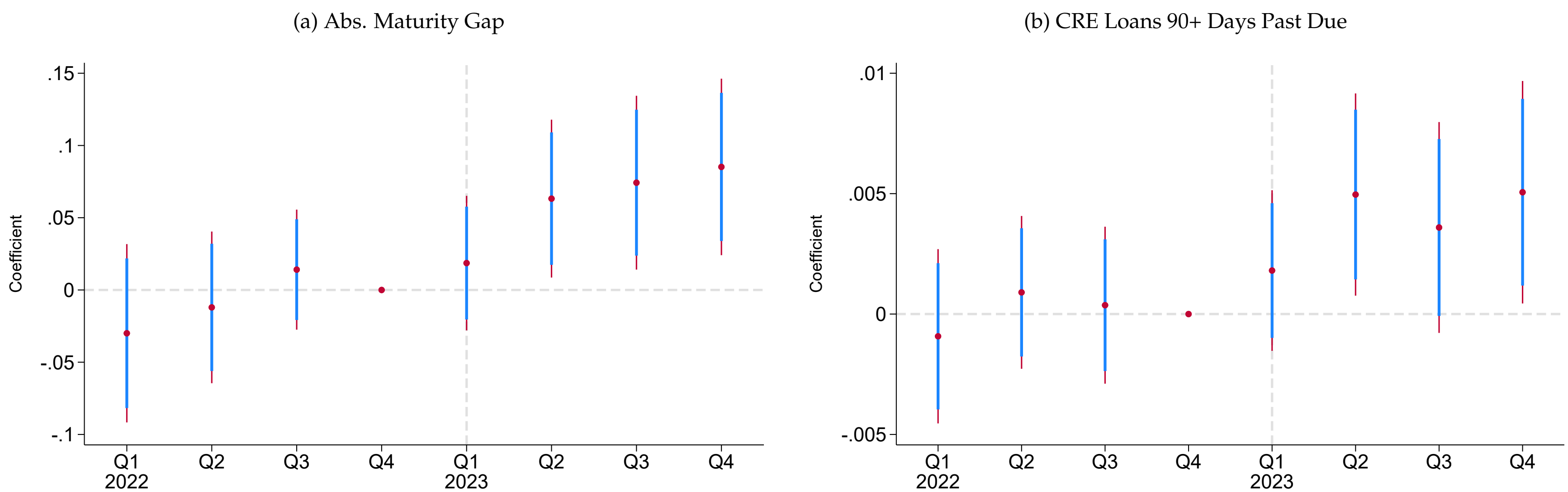
Notes: This figure plots the quarterly change in insured deposits, total deposits, and total assets at network and non-network banks. Panels (b), (d), and (f) plot cumulative growth rates. Network status is measured in 2022Q1. The sample includes small and midsize banks (less than $100 billion in assets) that were active between 2022Q1 and 2023Q4. The grey shaded area denotes the period after SVB's failure.
Source: Call Reports.

Figure 6: Dynamic Effects of Network Adoption on Deposits



Notes: This figure presents trends in total deposits, deposit rates, insured deposits, and total assets from 2022Q1 to 2023Q4. It plots the regression coefficients from the following specification: $Y_{b,t} = \alpha + \beta Switcher_b \times \mathbb{1}_t + X_b \times \mathbb{1}_t + \delta_b + \delta_t + \epsilon_{b,t}$. $Switcher_b$ is an indicator variable for banks that joined the network during the period surrounding the brokered-deposit ruling (between 2015Q1 and 2020Q2). $\mathbb{1}_t$ is an indicator for the specified quarter. Control variables X_b include the interactions of 2022Q4 bank size, capitalization, public entity deposits, profitability, securities holdings, and maturity of the securities portfolio, with $\mathbb{1}_t$. The sample is restricted to banks with public entity deposits on their balance sheet before 2015Q1. Standard errors are clustered by bank. The 90% and 95% confidence intervals are denoted in blue and red bars, respectively.
Source: Call Reports.

Figure 7: Dynamic Effects of Network Adoption on Bank Risk

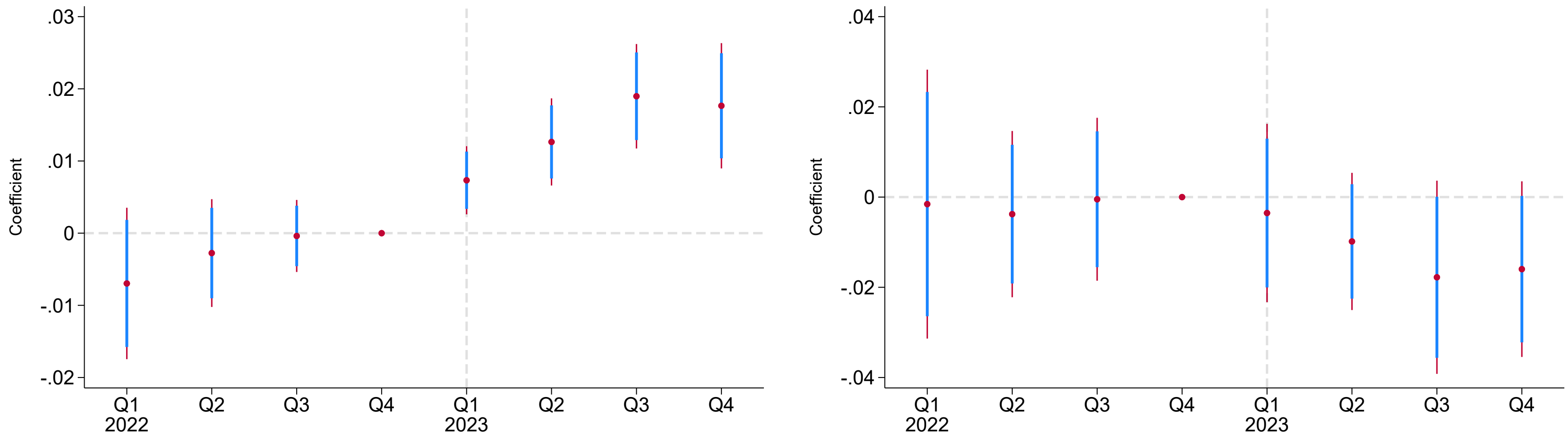


Notes: This figure presents trends in absolute maturity gap and the share of CRE loans 90+ days past due to 2022Q4 total assets from 2022Q1 to 2023Q4. It plots the regression coefficients from the following specification: $Y_{b,t} = \alpha + \beta Switcher_b \times \mathbb{1}_t + X_b \times \mathbb{1}_t + \delta_b + \delta_t + \epsilon_{b,t}$. $Switcher_b$ is an indicator variable for banks that joined the network during the period surrounding the brokered-deposit ruling (between 2015Q1 and 2020Q2). $\mathbb{1}_t$ is an indicator for the specified quarter. Control variables X_b include the interactions of bank size, capitalization, public entity deposits, and profitability, measured in 2022Q4, with $\mathbb{1}_t$. Panel (b) additionally include interactions of securities holdings and maturity of the securities portfolio. The sample is restricted to banks with public entity deposits on their balance sheet before 2015Q1. Standard errors are clustered by bank. The 90% and 95% confidence intervals are denoted in blue and red bars, respectively.
Source: Call Reports.

Figure 8: Total Asset Growth by Bank Size

(a) Small

(b) Midsize and Large



Notes: This figure presents trends in total assets from 2022Q1 through 2023Q4 across bank size groups. It plots the regression coefficients from the following specification: $ln(Assets)_{b,t} = \alpha + \beta Switcher_b \times \mathbb{1}_t + X_b \times \mathbb{1}_t + \delta_b + \delta_t + \epsilon_{b,t}$. $Switcher_b$ is an indicator variable for banks that joined the network during the period surrounding the brokered-deposit ruling (between 2015Q1 and 2020Q2). $\mathbb{1}_t$ is an indicator for the specified quarter. $ln(Assets)$ is defined as log total assets. Control variables X_b include the interactions of bank size, capitalization, public entity deposits, profitability, securities holdings, and maturity of the securities portfolio, measured in 2022Q4, with $\mathbb{1}_t$. The sample is restricted to banks with public entity deposits on their balance sheet before 2015Q1. Panel (a) includes banks with less than $10 billion in assets and panel (b) studies all other banks. Standard errors are clustered by bank. The 90% and 95% confidence intervals are denoted in blue and red bars, respectively.
Source: Call Reports.

Table 1: Descriptive Statistics

	N	p25	p50	p75	Mean	s. d.
Total assets ($1,000s, log)						
Network	1,524	12.75	13.49	14.43	13.69	1.32
Non-network	3,232	11.58	12.29	13.10	12.42	1.34
Return on assets (pct.)						
Network	1,524	0.20	0.29	0.38	0.28	0.21
Non-network	3,232	0.16	0.26	0.38	0.28	0.32
Total loans/total assets (pct.)						
Network	1,524	62.12	71.84	79.35	69.92	12.87
Non-network	3,232	45.89	58.88	72.13	57.14	20.38
Total equity/total assets (pct.)						
Network	1,524	7.59	8.89	10.59	9.25	3.30
Non-network	3,232	6.85	8.92	11.52	11.14	11.46
Total securities/total assets (pct.)						
Network	1,524	8.59	14.99	23.59	16.74	10.87
Non-network	3,232	11.93	22.88	34.60	24.33	15.86
Average maturity of securities (years)						
Network	1,503	6.19	9.25	12.20	9.24	4.20
Non-network	3,133	4.33	7.72	10.99	7.88	4.29
Insured deposits/total deposits (pct.)						
Network	1,524	51.46	60.77	69.90	59.96	14.71
Non-network	3,180	53.06	62.96	71.47	61.67	15.46
Public entity deposits/total deposits (pct.)						
Network	1,524	4.21	8.45	13.55	9.61	6.90
Non-network	3,180	2.39	7.88	14.60	9.44	8.31
Number of branches (log)						
Network	1,521	1.39	1.95	2.71	2.02	1.15
Non-network	3,168	0.00	1.10	1.79	1.15	0.99

Notes: This table reports summary statistics for network and non-network banks as of 2022Q4. "N" denotes the number of observations. "p25," "p50," and "p75" correspond to the 25th, 50th, and 75th percentiles, respectively. "s.d." denotes standard deviation.
Source: Call Reports, FDIC Summary of Deposits.

Table 2: Deposit Growth and Pre-SVB Network Presence

	(1)	(2)	(3)	(4)
	Δln(Ins. Dep.)	Δln(Tot. Dep.)	Δln(Ins. Dep.)	Δln(Tot. Dep.)
Network_{2022Q4}	0.0780***	0.0396***	0.0567***	0.0265***
	(0.0056)	(0.0032)	(0.0060)	(0.0034)
ROA_{2022Q4}			-0.0597***	-0.0321***
			(0.0171)	(0.0108)
$\text{Securities/Assets}_{2022Q4}$			-0.0022***	-0.0017***
			(0.0002)	(0.0001)
$\text{Equity/Assets}_{2022Q4}$			0.0041***	0.0030***
			(0.0009)	(0.0006)
$\ln(\text{Assets})_{2022Q4}$			0.0065***	0.0023**
			(0.0018)	(0.0012)
Constant	0.0476***	0.0078***	-0.0047	-0.0016
	(0.0027)	(0.0019)	(0.0264)	(0.0174)
Observations	4,546	4,546	4,546	4,546
R^2	0.0474	0.0313	0.1194	0.1280

Notes: This table presents the relation between deposit growth from 2022Q4 to 2023Q4 and bank network status in 2022Q4. The dependent variable is insured deposit growth from 2022Q4 to 2023Q4 in columns (1) and (3) and total deposit growth from 2022Q4 to 2023Q4 in columns (2) and (4). Columns (3) and (4) include controls for bank-level characteristics, including bank size, securities holdings, capitalization, and profitability, as measured in 2022Q4. Heteroskedasticity-robust standard errors are reported in parentheses. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.
Source: Call Reports.

Table 3: Reciprocal Deposits and Deposit Growth

	(1)	(2)	(3)	(4)
	ΔInsured Share	ΔInsured Share	ΔTotal Share	ΔTotal Share
ΔRecip Share	0.7332***	0.7167***	0.1857***	0.1669***
	(0.0527)	(0.0535)	(0.0264)	(0.0261)
ROA_{2022Q4}		-0.0062		-0.0094
		(0.0089)		(0.0060)
$\text{Securities/Assets}_{2022Q4}$		-0.0006***		-0.0005***
		(0.0002)		(0.0001)
$\text{Equity/Assets}_{2022Q4}$		0.0006		0.0013***
		(0.0005)		(0.0003)
$\ln(\text{Assets})_{2022Q4}$		-0.0009		0.0003
		(0.0011)		(0.0007)
Constant	0.0045**	0.0232	-0.0209***	-0.0258**
	(0.0019)	(0.0158)	(0.0012)	(0.0105)
Observations	1,479	1,479	1,479	1,479
R^2	0.1625	0.1751	0.0339	0.0808

Notes: This table presents the relation between reciprocal deposit growth and overall deposit growth. The dependent variables are the quarterly change in the insured deposits to total assets (columns (1) and (2)) and total deposits to total assets (columns (3) and (4)) ratios between 2022Q4 and 2023Q1. The independent variable is the quarterly change in the reciprocal deposits to total assets ratio. Columns (2) and (4) include controls for bank-level characteristics, including bank size, securities holdings, capitalization, and profitability, as measured in 2022Q4. Heteroskedasticity-robust standard errors are reported in parentheses. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.
Source: Call Reports.

Table 4: Post-SVB Deposit Growth by Deposit Type

	$\frac{\Delta \text{Ins}}{\text{Deposits}_{2022Q4}}$		$\frac{\Delta(\text{Ins}-\text{Recip})}{\text{Deposits}_{2022Q4}}$		$\frac{\Delta \text{Unins}}{\text{Deposits}_{2022Q4}}$	
	(1)	(2)	(3)	(4)	(5)	(6)
Network_{2022Q4}	0.0466***	0.0331***	0.0154***	0.0068**	-0.0061**	-0.0068**
	(0.0033)	(0.0035)	(0.0029)	(0.0032)	(0.0027)	(0.0028)
ROA_{2022Q4}		-0.0279***		-0.0191**		-0.0245***
		(0.0099)		(0.0090)		(0.0070)
$\text{Securities/Assets}_{2022Q4}$		-0.0015***		-0.0012***		-0.0003***
		(0.0001)		(0.0001)		(0.0001)
$\text{Equity/Assets}_{2022Q4}$		0.0013***		0.0010***		0.0016***
		(0.0004)		(0.0004)		(0.0003)
$\ln(\text{Assets})_{2022Q4}$		0.0034***		0.0006		-0.0001
		(0.0011)		(0.0010)		(0.0009)
Constant	0.0288***	0.0163	0.0214***	0.0381***	-0.0144***	-0.0139
	(0.0016)	(0.0149)	(0.0015)	(0.0140)	(0.0014)	(0.0122)
Observations	4,573	4,573	4,573	4,573	4,573	4,573
R^2	0.0482	0.1115	0.0067	0.0577	0.0012	0.0300

Notes: This table presents the relation between network status and deposits by type. The independent variable is network status in 2022Q4, and the dependent variables are the change in insured deposits, insured minus reciprocal deposits, and uninsured deposits (from 2022Q4 to 2023Q4) divided by total deposits in 2022Q4. Columns (2), (4), and (6) include controls for bank-level characteristics, including bank size, securities holdings, capitalization, and profitability, as measured in 2022Q4. Heteroskedasticity-robust standard errors are reported in parentheses. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.
Source: Call Reports.

Table 5: Deposit Rates and Pre-SVB Network Presence

	(1)	(2)	(3)	(4)
	ΔDep. Rate	Δln(Time Dep.)	ΔDep. Rate	Δln(Time Dep.)
Network_{2022Q4}	-0.1633***	0.1083***	-0.0869**	0.0406***
	(0.0388)	(0.0113)	(0.0426)	(0.0124)
ROA_{2022Q4}			0.2471**	0.0014
			(0.1086)	(0.0346)
$\text{Securities/Assets}_{2022Q4}$			0.0040***	-0.0021***
			(0.0015)	(0.0004)
$\text{Equity/Assets}_{2022Q4}$			0.0015	-0.0045**
			(0.0057)	(0.0019)
$\ln(\text{Assets})_{2022Q4}$			-0.0431***	0.0446***
			(0.0146)	(0.0044)
Constant	1.0942***	0.3285***	1.4515***	-0.1384**
	(0.0232)	(0.0062)	(0.2066)	(0.0618)
Observations	3,379	3,379	3,379	3,379
R^2	0.0051	0.0283	0.0119	0.0811

Notes: This table presents the relation between network status and the changes in deposit rates and quantities from 2022Q4 to 2023Q4. The dependent variable in columns (1) and (3) is the change in the deposit rate offered on 12-month certificates of deposits with a minimum account size of $10,000. In columns (2) and (4), the dependent variable is time deposit growth. Columns (3) and (4) include controls for bank-level characteristics, including bank size, securities holdings, capitalization, and profitability, as measured in 2022Q4. Heteroskedasticity-robust standard errors are reported in parentheses. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.
Source: Call Reports, RateWatch.

Table 6: Triple-Differences Regression: Pre-SVB Network Presence and Deposit Type

ln(Deposits)	(1)	(2)	(3)
Network × Post × Insured	0.1001***	0.0961***	0.0961***
	(0.0124)	(0.0120)	(0.0120)
Network × Insured	-0.0909***		
	(0.0226)		
Post× Insured	0.0832***	0.0822***	
	(0.0052)	(0.0050)	
Insured	0.5269***		
	(0.0121)		
Bank × Quarter-Year FE	✓	✓	✓
Bank × Insured FE		✓	✓
Insured × Quarter-Year FE			✓
N	68,056	68,056	68,056
R^2	0.9532	0.9952	0.9952

Notes: This table presents the causal effect of network affiliation on deposit quantities using a triple difference-in-differences specification. *Insured* is an indicator variable for insured deposits, *Network* is a binary variable indicating network affiliation in 2022Q4, and *Post* is a binary variable indicating time periods after 2022Q4. The coefficient of interest is on the triple-interaction term, *Network* × *Post* × *Insured*. Standard errors clustered at the bank level are reported in parentheses. *, **, and ***, represent statistical significance at the 10%, 5%, and 1% levels, respectively.
Source : Call Reports.

Table 7: Descriptive Statistics: Network Adoption

	Switcher ($N = 555$)		Non-switcher ($N = 2,605$)		
	Mean	s.d.	Mean	s.d.	Diff.
Total assets ($1,000s, log)	13.41	1.35	12.38	1.28	1.04***
					(0.000)
Return on assets (pct.)	0.29	0.23	0.27	0.35	0.02**
					(0.014)
Total loans/total assets (pct.)	70.56	15.07	58.03	18.73	12.53***
					(0.000)
Total equity/total assets (pct.)	9.17	3.38	9.37	5.30	-0.20
					(0.657)
Total securities/total assets (pct.)	16.80	10.76	25.51	15.72	-8.71***
					(0.000)
Average maturity of securities (years)	9.17	4.14	7.91	4.26	1.26***
					(0.000)
Insured deposits/total deposits (pct.)	60.84	13.28	62.11	14.05	-1.27**
					(0.032)
Public entity deposits/total deposits (pct.)	9.74	7.19	10.67	8.91	-0.92**
					(0.012)
Brokered deposits/total deposits (pct.)	3.59	5.91	1.79	6.52	1.80***
					(0.000)
Number of branches (log)	1.87	1.15	1.16	0.98	0.71***
					(0.000)

Notes: This table reports summary statistics for switcher and non-switcher banks as of 2022Q4. Switchers are banks that joined the network during the period surrounding the brokered-deposit ruling (between 2015Q1 and 2020Q2). Non-switchers are banks that did not join the network through 2020Q2. We drop banks that joined the network prior to 2015. The sample is restricted to banks with public entity deposits on their balance sheet in 2014Q4 and spans eight quarters from 2022Q1 to 2023Q4."Diff." is the difference of means between switcher and non-switcher banks. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.
Source: Call Reports, FDIC Summary of Deposits.

Table 8: Deposit Flows, Deposit Rates, and Network Adoption

	(1) ln(Ins. Dep.)	(2) ln(Tot. Dep.)	(3) Dep. Rate	(4) ln(Time Dep.)
Switcher × Post	0.0485***	0.0164***	-0.1079*	0.0444***
	(0.0073)	(0.0044)	(0.0595)	(0.0150)
Controls	✓	✓	✓	✓
Bank FE	✓	✓	✓	✓
Quarter-Year FE	✓	✓	✓	✓
N	23,962	23,962	16,942	16,942
R^2	0.9957	0.9972	0.7482	0.9837

Notes: This table presents the relation between deposit levels and switcher status during the 2023 banking crisis. The dependent variables are log insured deposits, log total deposits, average deposit rate offered on 12-month certificates of deposits with a minimum account size of $10,000, and log time deposits. *Switcher* is a binary variable that takes a value of 1 for banks that joined the network during the period surrounding the brokered-deposit ruling (between 2015Q1 and 2020Q2), and 0 for banks that did not join the network through 2020Q2. We drop banks that joined the network prior to 2015. *Post* is an indicator for 2023Q1 and later. All columns include bank and quarter-year fixed effects, as well as controls for interactions of bank size, securities holdings, maturity of securities portfolio, capitalization, public entity deposits, and profitability, all measured in 2022Q4, with the *Post* variable. The sample is restricted to banks with public entity deposits on their balance sheet in 2014Q4 and spans eight quarters from 2022Q1 to 2023Q4. Standard errors, clustered by bank, are reported in parentheses. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.
Source: Call Reports, RateWatch.

Table 9: Interest Rate Risk and Network Adoption

	(1) ln(Securities)	(3) ln(Maturity)	(4) ln(Abs. MatGap)
Switcher × Post	0.0388***	0.0370***	0.0830***
	(0.0102)	(0.0110)	(0.0274)
Controls	✓	✓	✓
Bank FE	✓	✓	✓
Quarter-Year FE	✓	✓	✓
N	18,403	18,403	18,403
R^2	0.9897	0.9920	0.9264

Notes: This table presents the relation between measures of interest rate risk and switcher status following the 2023 banking crisis. The dependent variables are log total securities, log average maturity of securities, and log absolute maturity gap. *Switcher* is a binary variable that takes a value of 1 for banks that joined the network during the period surrounding the brokered-deposit ruling (between 2015Q1 and 2020Q2), and 0 for banks that did not join the network through 2020Q2. We drop banks that joined the network prior to 2015. *Post* is an indicator for 2023Q1 and later. All columns include bank and quarter-year fixed effects, as well as controls for interactions of bank size, capitalization, public entity deposits, and profitability, all measured in 2022Q4, with the *Post* variable. The sample is restricted to banks with public entity deposits on their balance sheet in 2014Q4 and spans eight quarters from 2022Q1 to 2023Q4. Standard errors, clustered by bank, are reported in parentheses. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.
Source: Call Reports.

Table 10: Delinquency Rates on CRE Loans and Network Adoption

	Past-Due		
	(1)	(2)	(4)
	30-89 Days	$\geq$ 90 days	All
Switcher × Post	0.0052	0.0038***	0.0123**
	(0.0048)	(0.0013)	(0.0057)
Controls	✓	✓	✓
Bank FE	✓	✓	✓
Quarter-Year FE	✓	✓	✓
N	23,962	23,962	23,962
R^2	0.4088	0.3829	0.4549

Notes: This table presents the relation between measures of default risk and switcher status following the 2023 banking crisis. The dependent variables are CRE loans that are 30–89 days past due, 90 or more days past due, and 30 or more days past-due, divided by total assets in 2022Q4. *Switcher* is a binary variable that takes a value of 1 for banks that joined the network during the period surrounding the brokered-deposit ruling (between 2015Q1 and 2020Q2), and 0 for banks that did not join the network through 2020Q2. We drop banks that joined the network prior to 2015. *Post* is an indicator for 2023Q1 and later. All columns include bank and quarter-year fixed effects, as well as controls for interactions of bank size, securities holdings, maturity of securities portfolio, capitalization, public entity deposits, and profitability, all measured in 2022Q4, with the *Post* variable. The sample is restricted to banks with public entity deposits on their balance sheet in 2014Q4 and spans eight quarters from 2022Q1 to 2023Q4. Standard errors, clustered by bank, are reported in parentheses. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.
Source: Call Reports.

Table 11: Mechanism: Mediation through Reciprocal Deposits

	(1) Recip/Assets	(2) ln(Ins. Dep.)	(3) ln(Tot. Dep.)	(4) Dep. Rate	(5) ln(Time Dep.)	(6) ln(Securities)	(7) ln(Maturity)	(8) ln(Abs. MatGap)	(9) CRE $\geq$ 90 days
Switcher $\times$ Post	0.0136***								
	(0.0016)								
Recip/Assets		3.4621***	1.5202***	-8.1226*	3.2196***	2.2640**	2.2777**	5.2595***	0.3375***
		(0.5732)	(0.3507)	(4.5235)	(1.1580)	(1.0546)	(1.1309)	(1.8247)	(0.1256)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bank FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Quarter-Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	16,918	16,918	16,918	16,918	16,918	16,918	16,918	16,918	16,918
KP LM Statistic	62.033								
CD Wald F Statistic	751.498								
KP Wald F Statistic	68.016								

Notes: This table presents 2SLS estimates of the effect of network status on various bank outcomes following the 2023 banking crisis. In column (1), the dependent variable is the share of reciprocal deposits. *Switcher* is a binary variable that takes a value of 1 for banks that joined the network during the period surrounding the brokered-deposit ruling (between 2015Q1 and 2020Q2), and 0 for banks that did not join the network through 2020Q2. We drop banks that joined the network prior to 2015. In the second stage, the dependent variables are log insured deposits, log total deposits, the average deposit rate offered on 12-month certificates of deposits with a minimum account size of $10,000, log time deposits, log total securities, log maturity of securities, and log absolute maturity gap. The independent variable, reciprocal deposits share, is instrumented according to the DiD specification in column (1). All columns include bank and quarter-year fixed effects, as well as controls for interactions of bank size, capitalization, public entity deposits, and profitability, all measured in 2022Q4, with the *Post* variable. We additionally control for interactions of securities holdings, maturity of securities portfolio, measured in 2022Q4 with the *Post* variable in columns (2)-(5) and (9). The sample is restricted to banks with public entity deposits on their balance sheet in 2014Q4 and spans eight quarters from 2022Q1 to 2023Q4. Standard errors, clustered by bank, are reported in parentheses. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.
Source: Call Reports, RateWatch.

Table 12: Bank Size and Network Adoption

ln(Assets)	(1)	(2)	(3)	(4)	(5)	(6)
Small × Switcher × Post				0.0476***	0.0355***	0.0263**
				(0.0074)	(0.0090)	(0.0105)
Switcher × Post	0.0382***	0.0153***	0.0155***	-0.0073	-0.0200**	
	(0.0040)	(0.0041)	(0.0042)	(0.0062)	(0.0082)	
Small × Post				0.0138***	0.0573***	
				(0.0049)	(0.0086)	
Controls (exc. Size)		✓			✓	
Controls (inc. Size)			✓			✓
Switcher × Quarter-Year FE						✓
Small × Quarter-Year FE						✓
Bank FE	✓	✓	✓	✓	✓	✓
Quarter-Year FE	✓	✓	✓	✓	✓	
N	23,962	23,962	23,962	23,962	23,962	23,962
R^2	0.9976	0.9977	0.9977	0.9976	0.9977	0.9977

Notes: This table presents the relation between bank size and network status after the 2023 banking crisis. The dependent variable is log total assets. *Switcher* is a binary variable that takes a value of 1 for banks that joined the network during the period surrounding the brokered-deposit ruling (between 2015Q1 and 2020Q2), and 0 for banks that did not join the network through 2020Q2. *Small* is a binary variable that takes a value of 1 for banks with assets below $10 billion in 2022Q4, and 0 otherwise. *Post* is a binary variable that takes a value of 1 from 2023Q1 onwards, and 0 for previous quarters. Columns (2) and (5) include controls for the interactions of bank-level characteristics, including securities holdings, maturity of securities portfolio, capitalization, public entity deposits and profitability, measured in 2022Q4, with the *Post* variable. Columns (3) and (6) additionally control for the interaction term between bank size and the *Post* variable. Columns (1)-(5) include bank and quarter-year fixed effects, while column (6) includes switcher by quarter-year and size group by quarter-year fixed effects. The sample is restricted to banks with public entity deposits on their balance sheet before 2015Q1 and spans eight quarters from 2022Q1 to 2023Q4. Standard errors, clustered by bank, are reported in parentheses. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.
Source: FDIC Summary of Deposits, Call Reports.

Table 13: Deposit Market Share and and Network Adoption

Market Share	(1)	(2)	(3)	(4)	(5)
Switcher × Post	0.0039*	0.0039*	0.0039*	0.0049*	0.0052**
	(0.0023)	(0.0023)	(0.0023)	(0.0027)	(0.0025)
Switcher	-0.0304**				
	(0.0144)				
Post	-0.0000	-0.0000			
	(0.0015)	(0.0015)			
Bank × Zip Code FE		✓	✓	✓	✓
Year FE			✓		
Zip Code × Year FE				✓	✓
Controls					✓
N	55,054	55,054	55,054	55,054	55,054
R^2	0.0052	0.9847	0.9847	0.9898	0.9898

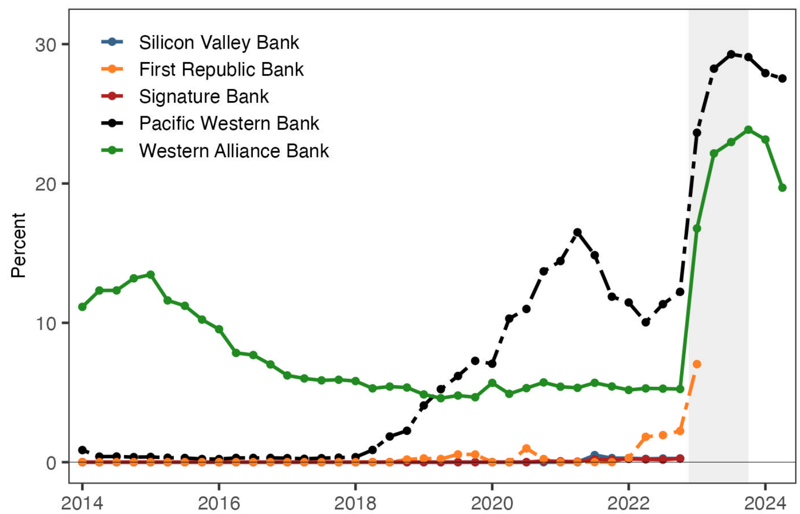
Notes: This table presents the relation between deposit market share and network adoption after the 2023 banking crisis. The dependent variable is bank b's local market share ($\frac{\text{Bank Deposits}_{b,z,t}}{\text{Total Deposits}_{z,t}}$) in zip code z in quarter-year t. *Switcher* is a binary variable that takes a value of 1 for banks that joined the network during the period surrounding the brokered-deposit ruling (between 2015Q1 and 2020Q2), and 0 for banks that did not join the network through 2020Q2. *Post* is a binary variable that takes a value of 1 from 2023Q1 onwards and 0 for previous quarters. Column (2) includes bank × zip code fixed effects. Column (3) includes both bank × zip code and year fixed effects. Column (4) includes bank × zip code and zip code × year fixed effects. Column (5) additionally controls for the interaction of 2022Q4 securities holdings, portfolio maturity, capitalization, public entity deposits, and profitability with the *Post* variable. The sample is restricted to banks with public entity deposits on their balance sheet in 2014Q4 and spans eight quarters from 2022Q1 to 2023Q4. Standard errors, clustered by bank, are reported in parentheses. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.
Source: FDIC Summary of Deposits, Call Reports.

Internet Appendix for:
The Economics of Network-Based Deposit Insurance

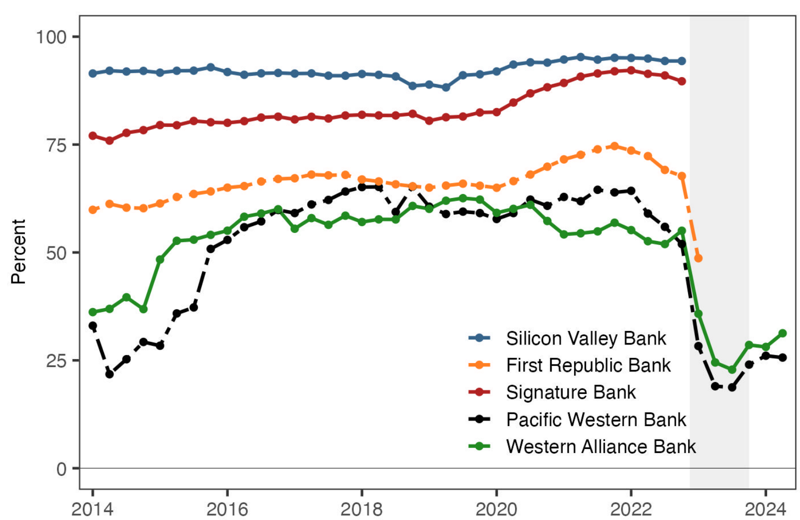
Appendix Appendix A Figures and Tables

Figure A.1: Distressed Regional Banks during the 2023 Banking Crisis

(a) Reciprocal Deposits



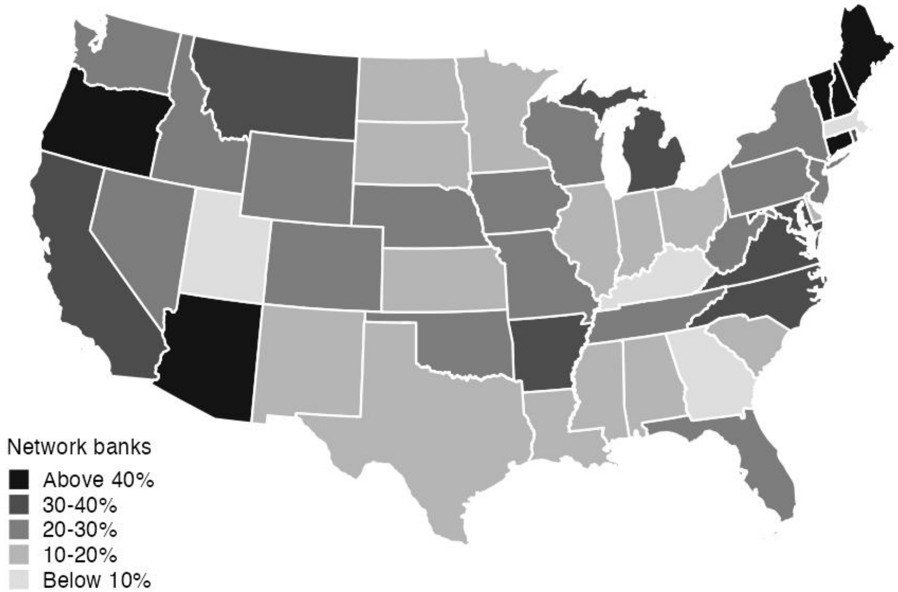
(b) Uninsured Deposits



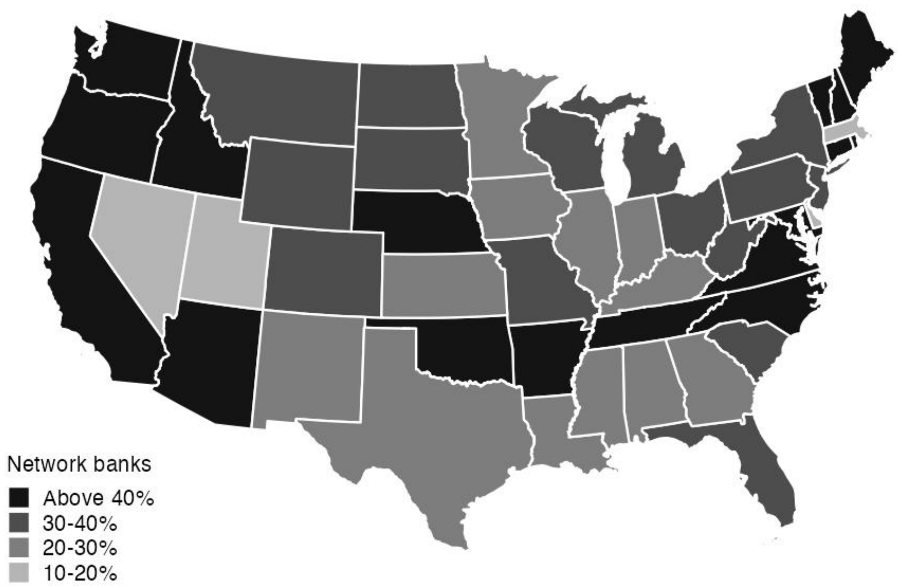
Notes: This figure plots the evolution of reciprocal deposits and uninsured deposits for five banks affected by the regional banking crisis. The sample period is 2014Q1 to 2024Q2. Panel (a) plots the reciprocal deposits to total deposits ratio and panel (b) plots the uninsured deposits to total deposits ratio. The grey shaded area denotes the 4 quarters following SVB's failure.
Source: Call Reports.

Figure A.2: Network Participation Across States

(a) 2017Q4



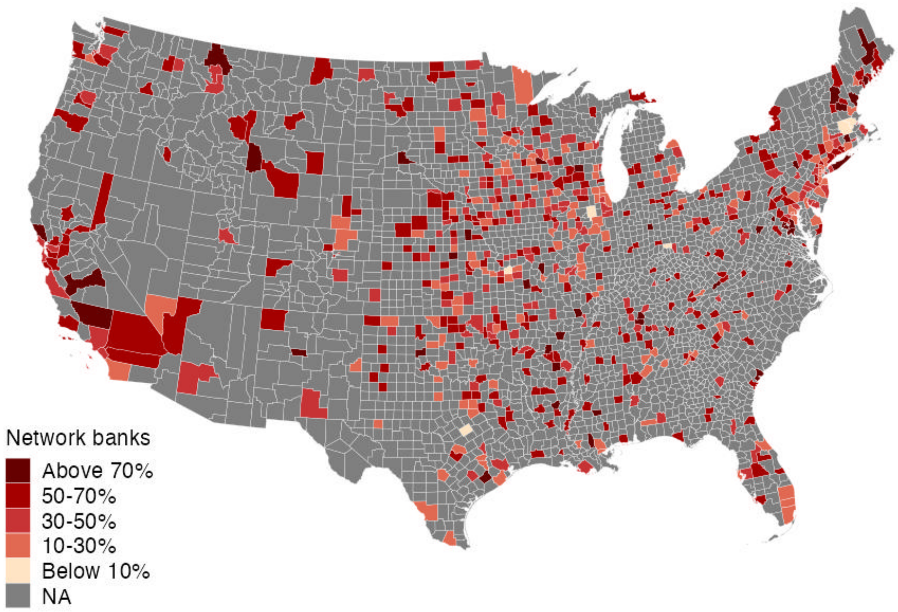
(b) 2022Q4



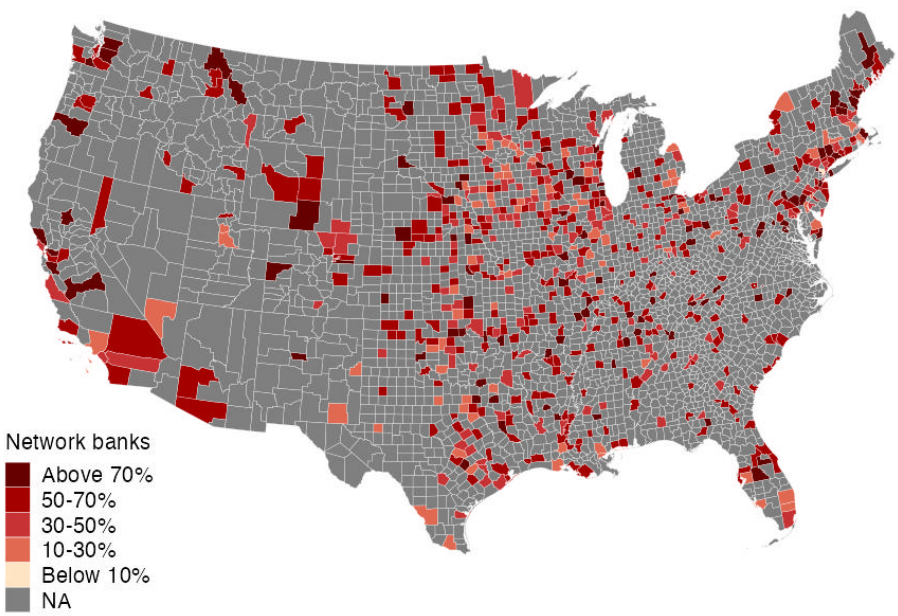
Notes: This figure plots the fraction of network banks by state in 2017Q4 and 2022Q4. Network banks are defined as banks with positive reciprocal deposits. Bank locations are determined using the address of the main office.
Source: Call Reports.

Figure A.3: Network Participation Across Counties

(a) 2017Q4

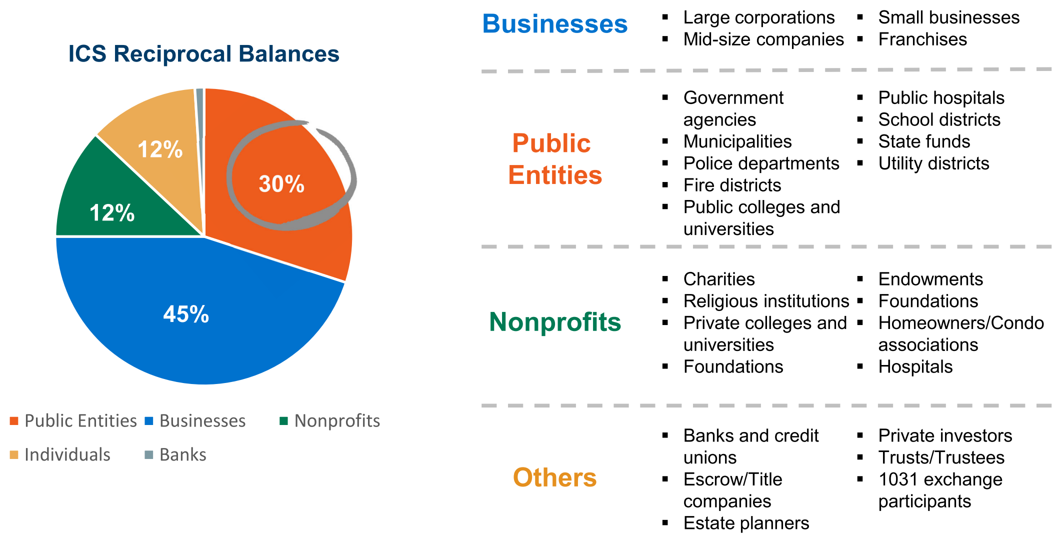


(b) 2022Q4



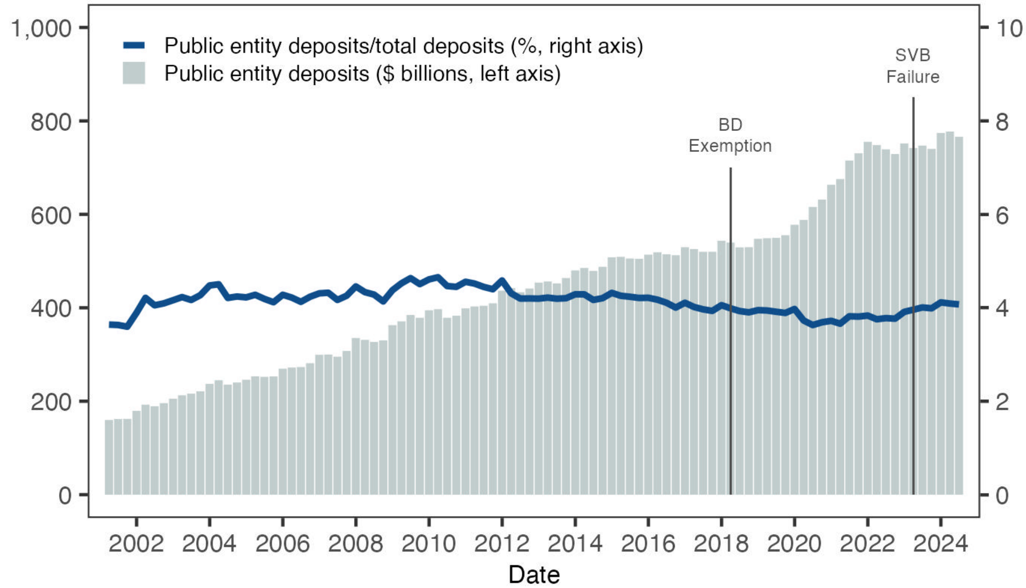
Notes: This figure plots the fraction of reciprocal deposit network banks by county in 2017Q4 and 2022Q4. Network banks are defined as banks with positive reciprocal deposits. Bank locations are determined using the address of the main office and counties with at least two incorporated banks are included.
Source: Call Reports.

Figure A.4: Customers of Reciprocal Deposits



Notes: This figure details the breakdown of the customers of reciprocal deposits as of 2021. It shows that reciprocal deposits are used by a variety of customers, including businesses and public entities.
Source: IntraFi Network LLC (https://napsf.org/file_download/inline/056ae2f2-3b49-45f4-b0b4-ee5e67d81608).

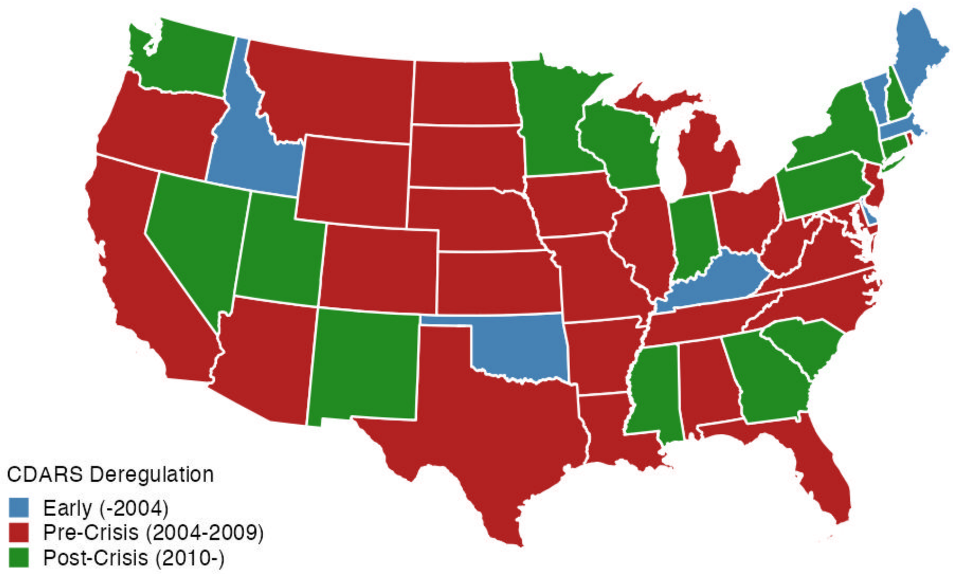
Figure A.5: Growth of Public Entity Deposits



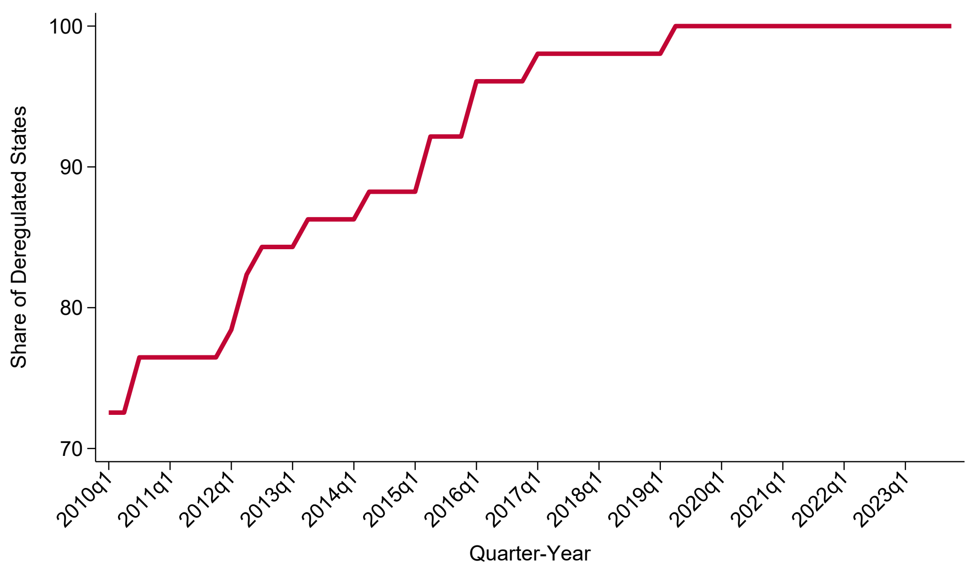
Notes: This figure plots the dollar amount of public entity deposits (grey bars, left axis) and the ratio of public entity deposits to total deposits (blue line, right axis) between 2000Q1 and 2024Q2. "BD Exemption" signifies when the EGR-RCPA exempted a capped amount of reciprocal deposits from being treated as brokered deposits, and "SVB Failure" marks the start of the 2023 regional banking crisis.
Source: Call Reports.

Figure A.6: Deregulation of Public Entity Deposits

(a) Geography of Deregulation

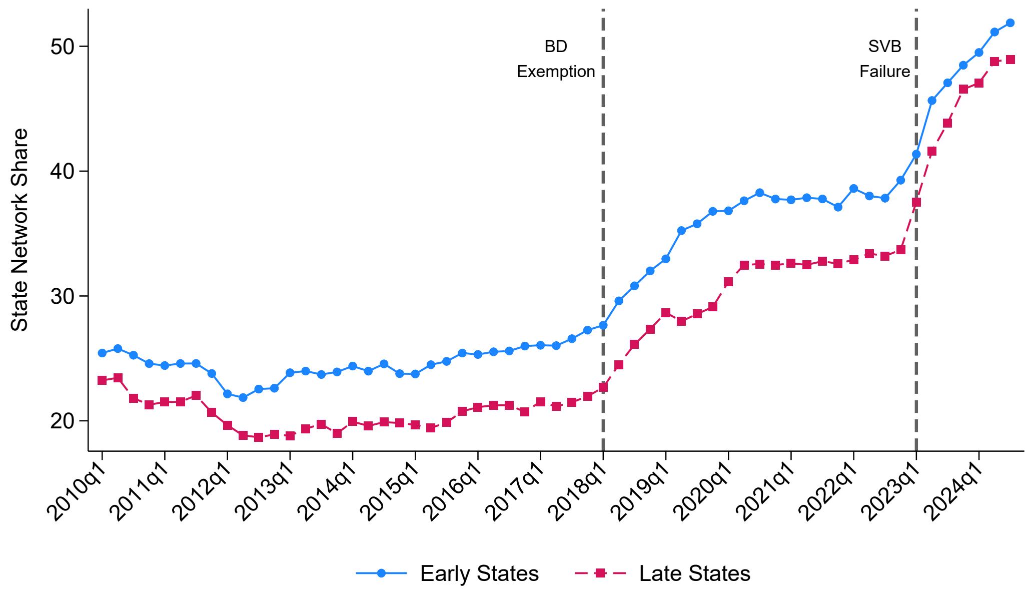


(b) Time-Series of Deregulation



Notes: Panel (a) plots the spatial distribution of deregulation by phase (early, pre-crisis, and post-crisis). Panel (b) plots the fraction of states that authorized public entity deposits in reciprocal deposit accounts. "Early" deregulation states include those that implicitly allowed reciprocal deposits since the network's inception.
Source: IntraFi, authors' calculations.

Figure A.7: Network Participation Among Early and Late Deregulators



Notes: This figure presents state-level trends in the share of network banks from 2010Q1 to 2023Q4. "BD Exemption" signifies when the EGRRCPA exempted a capped amount of reciprocal deposits from being treated as brokered deposits, and "SVB Failure" marks the start of the 2023 regional banking crisis.
Source: Call Reports, IntraFi, authors' calculations.

Table A.1: Network Banks (Ranked by Deposit Amount)

	Name	Location	Reciprocal deposits ($ millions)	Total assets ($ millions)
		Panel A: 2017Q4		
1	United Bank	Fairfax, VA	1,494	19,042
2	Western Alliance Bank	Phoenix, AZ	1,019	20,404
3	Park National Bank	Newark, OH	1,008	7,471
4	BOK Financial	Tulsa, OK	939	32,217
5	Mutual of Omaha Bank	Omaha, NE	754	8,145
6	Iberiabank	Lafayette, LA	684	27,824
7	Flushing Bank	Uniondale, NY	641	6,300
8	Tristate Capital Bank	Pittsburgh, PA	627	4,692
		Panel B: 2022Q4		
1	UBS Bank	Salt Lake City, UT	6,621	120,987
2	Pacific Western Bank	Beverly Hills, CA	4,191	41,184
3	First Republic Bank	San Francisco, CA	3,948	212,639
4	Pinnacle Bank	Nashville, TN	3,587	41,843
5	Western Alliance Bank	Phoenix, AZ	2,830	67,684
6	Huntington National Bank	Columbus, OH	2,806	182,326
7	United Bank	Fairfax, VA	2,704	29,430
8	Citizens Bank	Providence, RI	2,247	226,401
		Panel C: 2023Q4		
1	Western Alliance Bank	Phoenix, AZ	13,288	70,853
2	Raymond James Bank	Saint Petersburg, FL	13,143	41,986
3	Banc of California	Los Angeles, CA	8,891	38,369
4	Pinnacle Bank	Nashville, TN	8,647	47,830
5	Citizens Bank	Providence, RI	8,223	221,750
6	First Citizens Bank	Raleigh, NC	7,602	213,618
7	Zions Bank	Salt Lake City, UT	6,841	87,202
8	Keybank	Cleveland, OH	5,559	185,890

Notes: This table reports the banks with the largest amounts of reciprocal deposits as of 2017Q4 (Pre-BD exemption), 2022Q4 (Pre-SVB), and 2023Q4 (Post-SVB). Headquarter location is obtained from the Call Reports' Panel of Reporters.
Source: Call Reports.

Table A.2: Network Banks (Ranked by Concentration)

	Name	Location	Total assets ($ millions)	Recip/Assets (Percent)
		Panel A: 2017Q4		
1	Eagle Bank	Polson, MT	65	41.4
2	Great Plains State Bank	Petersburg, NE	163	31.2
3	Saint Louis Bank	Town and Country, MO	420	31.9
4	Independence Bank	Havre, MT	715	30.3
5	First National Bank of Syracuse	Syracuse, KS	328	29.2
6	Western National Bank of Cass Lake	Cass Lake, MN	31	28.1
7	Genesee Regional Bank	Rochester, NY	549	27.7
8	Bank2	Oklahoma City, OK	133	27.1
		Panel B: 2022Q4		
1	Chickasaw Community Bank	Oklahoma City, OK	479	47.0
2	Transpecos Bank	Pecos, TX	422	45.9
3	Eagle Bank	Polson, MT	120	42.1
4	Liberty National Bank	Lawton, OK	990	35.0
5	First National Bank of Oklahoma	Oklahoma City, OK	748	34.8
6	Local Bank	Hulbert, OK	295	33.7
7	Saint Louis Bank	Saint Louis, MO	824	32.8
8	Woodlands National Bank	Hinckley, MN	336	29.3
		Panel C: 2023Q4		
1	Transpecos Bank	Pecos, TX	767	53.6
2	Liberty National Bank	Lawton, OK	1,223	50.1
3	Lakeside Bank	Rockwall, TX	352	46.8
4	Optus Bank	Columbia, SC	525	45.4
5	Illinois National Bank	Springfield, IL	2,168	42.8
6	Eagle Bank	Polson, MT	133	42.0
7	Endeavor Bank	San Diego, CA	570	41.7
8	Chickasaw Community Bank	Oklahoma City, OK	447	39.6

Notes: This table reports the banks with the largest share of reciprocal to total assets as of 2017Q4 (Pre-BD exemption), 2022Q4 (Pre-SVB), and 2023Q4 (Post-SVB). Headquarter location is obtained from the Call Reports' Panel of Reporters. *Source:* Call Reports.

Table A.3: Descriptive Statistics: Post-SVB Crisis

	N	p25	p50	p75	Mean	Std. Dev.
Total assets ($1,000s, log)						
Network	1,944	12.70	13.46	14.40	13.66	1.32
Non-network	2,697	11.49	12.19	12.97	12.30	1.29
Return on assets (pct.)						
Network	1,944	0.12	0.22	0.32	0.21	0.24
Non-network	2,697	0.09	0.21	0.34	0.24	0.37
Total loans/total assets (pct.)						
Network	1,944	63.59	72.93	79.89	70.54	13.05
Non-network	2,697	47.56	61.22	73.15	58.32	20.64
Total equity/total assets (pct.)						
Network	1,944	7.89	9.20	10.85	9.52	3.36
Non-network	2,697	7.77	9.71	12.68	12.43	12.31
Total securities/total assets (pct.)						
Network	1,944	7.74	13.86	22.15	15.83	10.90
Non-network	2,697	11.11	21.43	32.87	23.02	15.46
Average maturity of securities (years)						
Network	1,912	5.73	8.75	11.77	8.84	4.26
Non-network	2,602	3.79	7.17	10.60	7.45	4.36
Insured deposits/total deposits (pct.)						
Network	1,944	55.44	63.99	72.08	62.93	13.41
Non-network	2,641	56.57	66.00	74.33	64.45	15.08
Public entity deposits/total deposits (pct.)						
Network	1,944	4.21	8.55	13.85	9.80	7.09
Non-network	2,641	2.52	8.23	15.33	9.96	8.65
Number of branches (log)						
Network	1,940	1.10	1.79	2.64	1.95	1.15
Non-network	2,634	0.00	1.10	1.61	1.07	0.94

Notes: This table reports summary statistics for network and non-network banks as of 2023Q4. “N” refers to the number of observations. “p25,” “p50,” and “p75” correspond to the 25th, 50th, and 75th percentiles, respectively. “s.d.” denotes standard deviation.
Source: Call Reports, FDIC Summary of Deposits.

Table A.4: Deposit Growth, FHLB Usage and Pre-SVB Network Presence

	(1)	(2)	(3)	(4)	(5)	(6)
	Δln(Tot. Dep.)	Δln(Ins. Dep.)	Δln(Tot. Dep.)	Δln(Ins. Dep.)	Δln(Tot. Dep.)	Δln(Ins. Dep.)
Network_{2022Q4}	0.0187***	0.0521***	0.0178***	0.0510***	0.0180***	0.0520***
	(0.0044)	(0.0076)	(0.0044)	(0.0075)	(0.0043)	(0.0075)
Δ ln(FHLB)			-0.0147***	-0.0177***	-0.0136***	-0.0132***
			(0.0024)	(0.0036)	(0.0034)	(0.0045)
$\text{Network}_{2022Q4} \times \Delta$ ln(FHLB)					-0.0023	-0.0096
					(0.0047)	(0.0072)
ln(FHLB)_{2022Q4}	0.0072***	0.0107***				
	(0.0017)	(0.0025)				
ROA_{2022Q4}	0.0223	0.0306	0.0158	0.0208	0.0157	0.0201
	(0.0160)	(0.0240)	(0.0158)	(0.0238)	(0.0158)	(0.0239)
$\text{Securities/Assets}_{2022Q4}$	-0.0021***	-0.0028***	-0.0023***	-0.0030***	-0.0023***	-0.0029***
	(0.0002)	(0.0003)	(0.0002)	(0.0003)	(0.0002)	(0.0003)
$\text{ln(Assets)}_{2022Q4}$	-0.0077***	-0.0094***	-0.0015	0.0001	-0.0015	0.0000
	(0.0023)	(0.0035)	(0.0015)	(0.0023)	(0.0015)	(0.0023)
$\text{Equity/Assets}_{2022Q4}$	0.0006	0.0001	0.0008	0.0003	0.0008	0.0003
	(0.0008)	(0.0014)	(0.0008)	(0.0014)	(0.0008)	(0.0014)
Constant	0.0844***	0.1261***	0.0805***	0.1171***	0.0805***	0.1171***
	(0.0225)	(0.0340)	(0.0222)	(0.0334)	(0.0223)	(0.0335)
N	2,188	2,188	2,188	2,188	2,188	2,188
R^2	0.1184	0.1034	0.1305	0.1070	0.1307	0.1078

Notes: This table presents the relation between deposit growth, bank network status, and Federal Home Loan Bank (FHLB) borrowing. The dependent variable is insured deposit growth from 2022Q4 to 2023Q4 in columns (1) and (3) and total deposit growth from 2022Q4 to 2023Q4 in columns (2) and (4). The key independent variable is network status measured in 2022Q4. Columns (1) and (2) control for the amount of FHLB borrowing in 2022Q4; columns (3) and (4) control for the growth in FHLB borrowing from 2022Q4 to 2023Q4; and columns (5) and (6) control for both the growth in FHLB borrowing from 2022Q4 to 2023Q4 and the interaction between 2022Q4 network status and FHLB borrowing growth. All columns additionally control for bank size, securities holdings, maturity of securities portfolio, capitalization, and profitability, as measured in 2022Q4. Heteroskedasticity-robust standard errors are reported in parentheses. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.
Source: Call Reports.

Table A.5: Deposits and Network Adoption: Adjusting for Public Entity Deposits

	(1) ln(Adj. Ins. Dep.)	(2) ln(Adj. Tot. Dep.)	(3) ln(Adj. Ins. Dep.)	(4) ln(Adj. Tot. Dep.)
Switcher $\times$ Post	0.0843***	0.0386***	0.0547***	0.0174***
	(0.0098)	(0.0045)	(0.0100)	(0.0047)
Controls			✓	✓
Bank FE	✓	✓	✓	✓
Quarter-Year FE	✓	✓	✓	✓
N	23,828	23,828	23,828	23,828
R^2	0.9909	0.9970	0.9911	0.9972

Notes: This table presents the relation between deposits and network adopters, after the 2023 banking turmoil. The dependent variables are log insured deposits excluding public entity deposits (columns (1) and (3)) and log total deposits excluding public entity deposits (columns (2) and (4)). *Switcher* is a binary variable that takes a value of 1 for banks that joined the network during the period surrounding the brokered-deposit ruling (between 2015Q1 and 2020Q2), and 0 for banks that did not join the network through 2020Q2. *Post* is a binary variable that takes a value of 1 from 2023Q1 onwards, and 0 for previous quarters. All columns include bank and quarter-year fixed effects. Columns (3) and (4) control for interactions of bank size, securities holdings, maturity of securities portfolio, capitalization, public entity deposits and profitability, measured in 2022Q4, with the *Post* variable. The sample is restricted to banks with public entity deposits on their balance sheet before 2015Q1 and spans eight quarters from 2022Q1 to 2023Q4. Standard errors, clustered by bank, are reported in parentheses. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.
Source: Call Reports.

Table A.6: Network Adoption: Exclusion of Large Banks

	(1) ln(Ins. Dep.)	(2) ln(Tot. Dep.)	(3) Dep. Rate	(4) ln(Time Dep.)	(5) ln(Securities)	(6) ln(Maturity)	(7) ln(Abs. MatGap)	(8) CRE $\geq$ 90 days	(9) ln(Assets)
Switcher $\times$ Post	0.0470***	0.0207***	-0.1089*	0.0437***	0.0324**	0.0326**	0.0752***	0.0047***	0.0191***
	(0.0078)	(0.0045)	(0.0595)	(0.0150)	(0.0147)	(0.0157)	(0.0251)	(0.0016)	(0.0044)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bank FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Quarter-Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	16,918	16,918	16,918	16,918	16,918	16,918	16,918	16,918	16,918
R^2	0.9962	0.9977	0.7485	0.9837	0.9843	0.9866	0.9307	0.3806	0.9980

Notes: This table presents the the causal effects of network adoption after excluding large banks (above $100 billion in assets). The dependent variables are insured deposits, total deposits, deposit rate offered on 12-month certificates of deposits with a minimum account size of $10,000, time deposits, total securities, maturity of securities portfolio, absolute maturity gap, and total assets. *Switcher* is a binary variable that takes a value of 1 for banks that joined the network during the period surrounding the brokered-deposit ruling (between 2015Q1 and 2020Q2), and 0 for banks that did not join the network through 2020Q2. *Post* is a binary variable that takes a value of 1 from 2023Q1 onwards, and 0 for previous quarters. All columns include bank and quarter-year fixed effects and control for the interaction of bank size, capitalization, public entity deposits and profitability, measured in 2022Q4, with the *Post* variable. Columns (1), (2), (3), (4), (8), and (9) additionally include interactions of securities holdings, maturity of securities portfolio, measured in 2022Q4, with the *Post* variable. The sample is restricted to banks with public entity deposits on their balance sheet before 2015Q1 and spans eight quarters from 2022Q1 through 2023Q4. Standard errors, clustered by bank, are reported in parentheses. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.
Source: Call Reports, RateWatch.