The Economics of Market-Based Deposit Insurance

Edward T. Kim[*] Shohini Kundu[†] Amiyatosh Purnanandam[‡]

June 2024

Abstract

We examine the financial stability implications of deposit insurance using a recent financial innovation: reciprocal deposits. Banks can significantly increase deposit insurance coverage through the reciprocal deposit network, where they break up large deposits and place them with other banks in an offsetting manner. With close to half a trillion dollars in outstanding contracts under this arrangement, reciprocal deposits have become an important source of funding for the U.S. banking sector. Using network presence as an instrument, we show that enhanced insurance coverage allowed banks to retain deposits following the 2023 banking crisis. Network banks pay lower interest rates on their deposits, indicating depositors' willingness to accept lower rates for higher insurance access. Enhanced coverage also has implications for competition and bank risk-taking; we find evidence that network banks grow larger and increase their exposure to interest rate risk.

For helpful comments, the authors thank Vasso Ioannidou as well as conference and seminar participants at UCLA Anderson and the 2024 London Business School Summer Finance Symposium.

[*]Stephen M. Ross School of Business, University of Michigan. e-mail: etkim@umich.edu

[†]UCLA Anderson School of Management and CEPR. e-mail: shohini.kundu@anderson.ucla.edu

[‡]Stephen M. Ross School of Business, University of Michigan. e-mail: amiyatos@umich.edu

1 Introduction

Deposit insurance is arguably the most consequential banking regulation of modern times. Most countries around the world use some form of deposit insurance to promote financial stability (Demirgüç-Kunt et al., 2014). A rich theoretical literature in economics and finance has emphasized two principal trade-offs of this policy tool: while deposit insurance can improve financial stability by lowering the probability of bank runs, it can also have an adverse effect on the system due to the insured banks' incentive to engage in excessive risk-taking (Diamond and Dybvig, 1983; Bhattacharya et al., 1998; Goldstein and Pauzner, 2005). Hence, the efficacy of the regulation depends on two central questions: (a) how does the insurance coverage affect depositors' behavior, especially during episodes of banking sector distress? and (b) how does it impact the insured banks' investment decisions? Despite the theoretical importance and policy relevance of these questions, causal empirical evidence regarding the effect of deposit insurance coverage on financial and real outcomes remains elusive. Even less is known about the implications of recent financial innovations that allow banks to increase coverage for their depositors without regulatory changes to the coverage limit. Our paper attempts to fill this gap in the literature.

The primary empirical challenge arises from the fact that there is practically no cross-sectional variation in access to deposit insurance coverage across banks within a country. Regulators such as the United States' Federal Deposit Insurance Corporation (FDIC) set nationwide coverage limits, providing depositors the exact same insurance benefits irrespective of their banking relationship. Depositors, as a result, have no preference for banks in terms of how much insurance coverage they can get. Lack of variation in deposit insurance coverage across banks 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 are occasional changes in the coverage limit over time, comparing banks' and depositors' behavior across different time periods with varying levels of deposit insurance coverage is likely to be biased; these changes correlate with other economic attributes such as the strength of the economy and other regulations that can independently affect banks' and depositors' behavior. A similar critique applies to cross-country analyses since countries differ across a host of regulatory and economic factors that likely correlate with the structure of their deposit insurance programs.

We study a recent financial innovation in the U.S. banking sector – reciprocal deposits – to overcome this challenge and obtain cross-sectional variation in deposit insurance limits. Even though the insurance limit of $250,000 per depositor per bank remains the same for every bank in the U.S., banks on the reciprocal deposit network can obtain much larger insurance limits for their depositors. They are able to do so by breaking up their large deposits into smaller amounts, each within the insurance limit of $250,000, and placing them with other banks in a reciprocal, i.e., offsetting, manner. In other words, participating banks effectively insure a piece of one another's large deposits so that they stay within the FDIC's insurance limit. As a result, depositors of participating banks can obtain insurance coverage on the entirety of their deposits, irrespective of the amount deposited with their relationship bank.

This market-based solution for deposit insurance shares several features with the traditional system, but it also creates some new trade-offs. The key trade-off highlighted by the theoretical literature and discussed widely in policy debates remain the same: improved financial stability during the periods of stress versus increased risk-taking by the insured. In addition, such a system has the potential to change the industrial organization of the banking sector. Enhanced access can lower the attractiveness of implicit government guarantees that the largest banks of the economy enjoy. Uninsured depositors need not run to these banks if they can obtain explicit insurance at their relationship banks, regardless of their size. A market-based solution to deposit insurance can thus alter the relative competitiveness of large versus small banks in the economy. In this paper, we evaluate these implications by 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).

The regional banking crisis provides an attractive setting to study deposit insurance for several reasons. Concerns about uninsured deposits and bank runs were at the forefront of academic and policy discussions during the crisis (Chang et al., 2023). At the same time, we observe large differences in terms of banks' presence on the reciprocal deposit network. These features of our empirical setting allow us to exploit heterogeneity in insurance coverage across banks to their depositors' behavior during the immediate aftermath of the crisis. The crisis also provides a useful setting to study the risk-taking behavior of banks; the key trigger of bank's risk exposure was their exposure to interest rate risk (Jiang et al., 2023), which is relatively straightforward to measure at the time an investment decision is made unlike credit risk observed from default outcomes that typically follow a long lag. Finally, the regional banking crisis provides an ideal setting to study the effect of deposit insurance on the industrial organization of the banking sector, since uninsured depositors experienced a strong incentive to run to the biggest banks in the country due to their too-big-to-fail guarantee.

We begin our analysis by providing some key statistics of this financial innovation for market-based deposit insurance. While reciprocal deposits have existed since the early 2000s, it came into prominence after a FDIC ruling in 2018 that exempted them from being classified as brokered deposits up to certain limits, either in dollar terms or as a percentage of the bank's liabilities. The ruling made reciprocal deposits an attractive form of financing by lowering regulatory costs, most notably the insurance premium that a bank pays. About 21% of banks in our sample were on the network before 2018, which increased steadily to over 32% by 2022Q4. Commensurately, the amount of reciprocal deposits increased from $46 billion in 2017 to $157 billion in 2022Q4. The dollar amount of reciprocal deposits increased by 41% to over $222 billion in just a quarter from 2022Q4 to 2023Q1, i.e., within a short period after the onset of the SVB crisis in early March of 2023. Interestingly, the number of banks on the network increased by a modest 7% over this time period, suggesting that most of the increase in reciprocal deposits came from banks that were already on the network in 2022Q4.

Reciprocal deposits are used by banks of all sizes, but small banks (assets below $10 billion) and midsize banks (assets between $10 billion and $100 billion) have been the more frequent users of this facility. This broad pattern is consistent with the idea that the very large banks enjoy implicit too-big-to-fail guarantees and are less inclined to using reciprocal deposits. In terms of the geographic distribution of participating banks, users have been spread all over the country, with slightly higher concentrations in the Midwest and Northeast regions.

The reciprocal deposit network allows participant banks to obtain significantly higher insurance coverage for their depositors by dividing their deposits into smaller packets and placing them with several other banks. In theory, such an arrangement can provide insurance for the entire deposit base of the banking sector. There are, however, considerable frictions in doing so because banks must find other banks to enter into the reciprocal arrangement with. As search and matching costs can be substantial, an intermediated solution has emerged: Networks operated by independent firms, such as IntraFi, work as a coordinating device across banks. While any bank can join the network, doing so entails considerable time and upfront costs. To start, banks need to set up their internal control framework and integrate their system with the network provider in order to participate in this market. For example, the interest rate that a depositor obtains is determined by the relationship bank where they deposit their funds. The interest rate offered by the reciprocal bank to their depositors, however, may be different. Therefore, when two banks enter into a reciprocal deposit relationship, they need to regularly settle the difference in the interest amount paid to each others' depositors via an arrangement called the "rate bridge payment." The bank also needs to maintain a detailed record of reciprocal arrangements and report the key details to their customers on a regular basis. There are other setup costs such as training bank branch managers about the product, creating customer awareness, reporting costs and compliance issues such as KYC verification. The time to join the network can be as long as 2-3 months based on our conversation with industry experts.

Motivated by these features of the market, we study the financial stability implications of deposit insurance using a bank's presence on the network prior to the crisis as an instrument for access to higher insurance coverage during the crisis. Our exogeneity restriction rests on one key assumption: the setup cost and delay in joining the network. In the immediate aftermath of the crisis, banks already on the network could provide enhanced access to their depositors, whereas the ones not on the network could not do so immediately even when concerns about depositor runs were obvious. This variation allows us to identify the effect of deposit insurance coverage on outcomes such as depositor withdrawals, deposit interest rates, risk-taking decisions of the bank, and changes in the industrial organization of the banking sector during the onset of the crisis. Our empirical design, in which we investigate the behavior of depositors and banks in the immediate aftermath of the crisis, along with the institutional features of the market (i.e., setup costs), make our work less susceptible to concerns such as endogenous selection of banks on the network. We control for observable differences across banks such as their size, measures of interest rate risk prior to the crisis, and the equity capitalization ratio to isolate the effects of these additional factors during the crisis.

We find that banks on the reciprocal deposit network in 2022Q4 increased their insured deposits by 5.5 to 7.8 percentage points between throughout 2023, depending on the model specification. The increase in insured deposits was not simply a reshuffling of deposits from uninsured deposits to insured ones; the total deposits of network banks grew by 1.70 to 4.13 percentage points as well. In fact, network and non-network banks had markedly different paths in terms of total deposit growth over this time period. While the dollar amount of total deposits grew at network banks soon after the crisis, the amount of deposits at non-network banks declined. This implies that network banks were able to grow their deposit base due to higher retention of existing depositors as well as an increase in their market shares. These results cannot be explained by size, security holdings, interest rate risk exposure, or equity capitalization as we control for these variables in the regression model.

On average, the annual growth rate of total deposits is about 1.6 percentage points for U.S. banks between 2010-2022, suggesting that the effect of network presence had an economically large impact on deposit growth. We relate the increase in insured deposits to a bank's total deposit growth by estimating a two-stage regression model. Using the presence on the network in 2022Q4 as an instrument for insured deposit growth, we estimate a positive elasticity of 0.31 to 0.54 between the growth in insured deposits and the growth in total deposits. If our effects were entirely driven by the conversion of existing uninsured deposits into insured ones, then we should find an elasticity of zero. Therefore, our results suggest that access to deposit insurance allowed network banks to grow their deposit base, i.e., it helped them stem the outflow of deposits from their banks in the immediate aftermath of the crisis.

Insured depositors were also willing to accept lower interest rates from network banks. Depending on the model specification, as of 2023Q3, the interest rates offered by a network bank were about 10 to 15 basis points lower on 12-month certificate of deposits (CDs) of up to $10,000 than rates offered by non-network banks. Similar results hold for interest rates on savings accounts. In the two-stage regression using network presence as the instrument for insured deposits, we show that banks with 1 percentage point higher insured deposit growth report 2 basis points lower interest rates on their 12-month CDs. The negative relationship indicate depositors' willingness to accept lower interest rates in return for higher access to insurance. The increase in the amount of insured deposits at network banks, in conjunction with the increase in its price to the depositors (i.e., lower interest rate), is consistent with the interpretation that our results are driven by demand-based factors. In other words, depositors value the additional insurance and therefore are willing to deposit larger quantities at network banks at lower rates. We can also approximate the value of deposit insurance: access to the network lowers the banks' cost of deposits by 10 to 15 basis points. These estimates are broadly of the same order of magnitude as the premiums that the FDIC currently charges.[1] Our estimates thus have important implications for deposit insurance pricing (Duffie et al., 2003).

So far, our findings indicate a strong response by depositors, both in terms of quantity and pricing, to differences in banks' access to deposit insurance. How did the banks themselves respond to the increased insurance coverage that resulted in significant deposit inflows? One possibility is that banks simply used the increased deposits to replace other sources of liabilities. In

[1]See the assessment rate schedule here: https://www.fdic.gov/deposit/insurance/assessments/proposed.html

such a scenario, we should not expect an increase in the size of the network banks. Our results reject this hypothesis: network banks' total assets grew by 4 percentage points between 2022Q4 and 2023Q4. Since most networks banks are smaller and regional banks, our results suggest that access to deposit insurance lowers the value of too-big-to-fail guarantees for some of the largest banks of the country. Overall, increased access to insurance has a direct impact on the size of the intermediary, which can in turn affect both the industrial organization of the banking sector and real economic outcomes.

In the final part of our analysis, we analyze the risk-taking implications of increased insurance coverage. We consider two measures of interest rate risk for our study: the maturity of securities held by the banks and the one-year maturity gap of banks that captures the interest-rate mismatch in all the assets and liabilities (Purnanandam, 2007). Our results show that network banks increased both the average maturity of securities and the maturity gap during the crisis. This implies that banks with increased deposit insurance access took on more interest rate risk as they received inflows of new deposits. Documenting an increase in observable measures of risk is a critical first step towards detecting the moral hazard effects of insurance coverage. However, a limitation of our study is that it cannot estimate whether the increase in interest rate risk exposure was efficient or inefficient.

In sum, we establish three main results in the paper: (a) higher access to insurance allows banks to attract depositors at a lower rate of interest, (b) banks with insurance access grow bigger and the relative market power of too-big-to-fail banks diminishes, and (c) banks take more risk in response. While some of these predictions have been discussed widely in the literature, our paper provides one of the first empirical evidence regarding deposit insurance's effect on depositor and bank behavior.

This paper relates to a large literature on financial stability and deposit insurance. It is related to Iyer and Puri (2012) and Martin et al. (2018), who document the role of deposit insurance on the run behavior of depositors at failing banks. Iyer et al. (2019) document the importance of too-big-to-fail guarantees on retail deposits using Danish data. Moreover, Iyer et al. (2016) highlight how the composition of a bank's depositor base impacts the likelihood of runs, particularly across low versus high insolvency shocks. Our paper also contributes to the ongoing debate on the causes and consequences of the regional banking crisis of 2023 (Jiang et al., 2023; Meiselman et al., 2023; Chang et al., 2023; Granja et al., 2024; Cookson et al., 2023; Granja, 2023). Broadly speaking, our work is related to the literature on the economics of deposit insurance, including analysis of the pricing of deposit insurance, the effect of deposit insurance on bank portfolio holdings, and the determinants of deposit interest rates (Marcus and Shaked, 1984; d'Avernas et al., 2023; Pennacchi, 1987; Kim and Rezende, 2023).

2 Institutional Background

In this section, we provide an overview of the reciprocal deposit market – a system that allows banks to extend FDIC insurance coverage beyond conventional limits. These institutional details provide foundational support for our empirical approach, which aims to explore the impact of the reciprocal deposit market on banks, depositors, and overall financial stability.

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.[2] To provide this enhanced coverage to depositors, banks must complete several crucial steps.

The key participants in the system are: (a) the depositor; (b) the relationship bank, which is where the depositor initially places their funds; (c) issuing institutions, which receive portions of the depositor's money in FDIC-insured amounts through reciprocal arrangements; (d) network providers like IntraFi, who manage the communication and transactions within the network; and (e) custodians or independent institutions (e.g., Bank of New York Mellon) that are responsible for record-keeping and maintaining asset custody for deposited funds.

To begin offering these services to depositors, banks must first undergo an onboarding process, which involves signing a contract with a network provider. This step requires integrating with the network's platform to ensure smooth communication and transaction processing. Banks must also train their staff to guide depositors effectively and market the product to attract those seeking enhanced FDIC coverage. For banks not already on the network, this onboarding process can take two to three months. This friction can inhibit swift adoption of this market-based deposit insurance mechanism.

When depositors place a large sum with their relationship bank, they lock in an interest rate set by that bank (the relationship bank). The relationship bank then uses the network to divide the large deposit into smaller FDIC-insured amounts and place them at other network banks. To maintain transparency and control, depositors sign a Deposit Placement Agreement (DPA) that

[2]For more details, visit: https://www.intrafinetworkdeposits.com/how-it-works/.

authorizes this distribution. This agreement often allows depositors to exclude specific banks if they wish. Our conversations with industry professionals suggest that this exclusion option is frequently used.

A critical aspect of reciprocal deposits is rate management. Since different issuing banks might offer varying interest rates, a "rate-bridge" agreement is used to ensure consistency. This agreement requires a network bank offering the higher rate to compensate the other bank for the difference, ensuring depositors have a consistent experience regardless of which bank holds their funds.

The depositor base for reciprocal deposits typically consists of large depositors, including retail depositors, small businesses, and local government agencies like municipalities and school districts.

3 New Facts on the Reciprocal Deposit Market

We begin our empirical analysis by uncovering several new insights regarding the historical development of the reciprocal deposit market. Section 5 focuses specifically on trends surrounding the SVB crisis.

First, we show that the reciprocal deposit market is a major source of deposit funding for banks today (Figure 1). In the beginning of 2011, the total amount of reciprocal deposits in the U.S. banking system was $25 billion representing 0.3% of total deposits. Today, these figures are $380 billion or 2% of total deposits, representing a cumulative growth rate of 666%. While reciprocal deposits have existed since the early 2000s, they were not commonly used by banks due to their classification as brokered deposits; brokered deposits are generally unattractive because they carry higher deposit insurance premiums compared to standard deposits. This changed after May 2018, when the Economic Growth, Regulatory Relief, and Consumer Protection Act (EGRRCPA) prompted a series of bank deregulation measures, one of which was the FDIC's new rule to exempt reciprocals from being classified as brokered deposits under certain criteria.[3] The rule made reciprocal deposits a relatively attractive form of financing, and we thus observe a steady increase in the volume of these deposits after June 2018. Specifically, 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, the total amount of reciprocal deposits

[3]See the Federal Register for more details.

increased from $25 billion to $46 billion from 2011 through 2017, representing an annual growth rate of 9%.

While these findings indicate that reciprocal deposits play a more salient role in funding markets today, it is unclear whether this increased utilization is driven by the intensive margin or by the extensive margin. To address this, we examine the fraction of U.S. banks that are on a reciprocal deposit network ("network banks") in Figure 2. While the percent of banks on the network remains around 20% from 2011 through 2018, we observe a notable increase from the beginning of 2018 through the end of 2022; 32% of banks are on the network by the end of 2022. Since the SVB crisis, there has been a sharp increase in the number of network banks to 42% by the end of 2023. Still, the increase in network membership during this period was not instant; assuming that growth would have remained at constant levels absent the bank failures, we only observe a 1 to 2 percentage point increase in network membership in the two weeks immediately following SVB's failure. June 2023 marks the first strong period of growth (around 3%), with participation continuing to rise through the end of 2023. This supports the industry insight that onboarding may take several months.

Second, we show that reciprocal deposits are utilized primarily by small (assets below $10 billion) and midsize (assets between $10 billion and $100 billion) banks; the largest banks of the country (assets above $100 billion) persistently exhibit low usage of reciprocal deposits. Prior to the BD exception, reciprocal deposits accounted for less than 2% of total deposits for small banks and less than 1% for midsize banks, with the largest banks reporting negligible amounts (less than 0.05%). The usage of reciprocal deposits increased across the bank size distribution following the regulatory change; small banks saw their share rise to around 3.1% by 2022Q4, whereas midsize banks reached 1.6%, and large banks continued to report minimal utilization. After the SVB crisis, we observe a significant rise in reciprocal deposits as a proportion of total deposits, particularly for midsize banks. Midsize banks' share of reciprocal deposits jumped from 1.6% in 2022Q4 to 5.8% by 2023Q4. Smaller banks also saw an increase, with their share growing from around 3.1% to 6.0% over the same period. The largest banks, however, only experienced a modest increase in this ratio (0.16% to 0.29%). These trends suggest that banks have increasingly turned to reciprocal deposits following the crisis, but that usage is not uniform across bank size groups.

Overall, we provide evidence that midsize and small banks are the primary users of reciprocal deposits, with midsize banks showing the largest uptick in reliance after the crisis. For illustration, 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 in 2017Q4, 2022Q4, and 2023Q4, as shown in Tables 2 and 3, respectively. High reciprocal deposit usage from banks above $100 billion in assets are first observed in 2022Q4, namely UBS Bank (foreign) and First Republic Bank (now defunct), Huntington National Bank, and Citizens Bank. Of note, none of the large institutions are included in the top banks list when ranked using the share of total deposits measure. Large banks are even less represented after the crisis – the only exceptions are Citizens Bank with assets of $221 billion and $8.2 billion in reciprocal deposits (3.7% of total assets) and First Citizens Bank with assets of $214 billion and $7.6 billion in reciprocal deposits (3.6% of total assets).[4] These findings are consistent with the idea that at the margin, smaller banks value access to deposit insurance more than their larger counterparts, perhaps due to the lack of implicit guarantees that the largest banks enjoy.

Third, reciprocal deposits are an important financial innovation that provides funding for banks throughout the nation. Figure 3 illustrates the geographic expansion of the reciprocal deposit network from 2011 to 2023. The figure reveals a higher concentration of network banks in the midwest and northeast regions, which is in part driven by the higher number of banks incorporated in those states. To determine whether these patterns simply reflect a lower overall number of banks in the West, we compare the fraction of network banks incorporated in each state to the total number of banks in that state (Figure 4). Panel 4a captures state-level network participation in the year prior to the BD Exception ruling (2017Q4), and Panel 4b shows participation in the quarter preceding the banking crisis (2022Q4). At the end of 2017, only seven states had more than 40% of their banks participating in the network. These states were concentrated in New England (New Hampshire, Vermont, Maine, Connecticut, and Rhode Island) with the remaining two coming from other regions (New Mexico and Oregon). By the end of 2022, the number of states with more than 40% network participation had significantly increased to 17 states, highlighting the widespread adoption of reciprocal deposits over time. The marked increase in participation rates among non-coastal states (e.g., Idaho, Oklahoma, Kansas, and Tennessee) is particularly notable, implying that reciprocal deposit networks – organized via online intermediation – helped banks achieve mutually beneficial relationships across geographic borders.

The distribution of network participation at the county level provides a deeper insight into the far reach of reciprocal deposits. Figure 5 shows that despite the innovative nature of recipro-

[4] For reference, domestic G-SIBs reported zero reciprocal deposits in 2023Q4, with the exception of Morgan Stanley ($1.1 billion) and Bank of America ($653 million).

cal deposits, network banks are not necessarily concentrated in the coastal regions or in the most populous counties. Of the counties with at least 10 banks as of 2022, the top 5 in terms of network participation were: Dane, WI (80%), Tulsa, OK (75%), Lancaster, NE (70%), Cass, ND (69%), and Fairfield, CT (64%). Comparable counties with the lowest participation rates were: Bergen, NJ (9%), New Castle, DE (13%), Salt Lake, UT (14%), Clark, NV (15%), and Jackson, MO (17%). We also document heterogeneity in network participation across the largest financial hubs of the nation; among the top 5 counties by bank count, network participation rates ranged from 14% (Salt Lake, UT) to 54% (Dallas, TX), with Los Angeles, CA (27%), New York, NY (34%), and Cook, IL (37%), in between.[5]

At the micro-level, we further corroborate the argument from Tables 2 and 3 that reciprocal deposits have gained prominence at a national scale over the past decades. Figure 6 plots headquarter locations of banks that exhibit the highest reliance on reciprocal deposits. In both periods, we observe significant geographic dispersion of banks with reciprocal deposit shares (the size of each circle) ranging from 0% to 46% in 2017 and 0% to 52% in 2022.

In the next sections, we describe the data used in this study and document how network access impacts deposit and asset growth.

4 Data and Descriptive Statistics

Reciprocal Deposits and Network Status. We define the network status of a bank using data from the quarterly Call Reports (FFIEC 031/041). Reciprocal deposits were originally classified as brokered deposits, which have historically been associated with increased regulatory costs. In 2018, the EGRRCPA rule exempted reciprocal deposits from being considered brokered deposits up to a cap. To account for reporting rule changes associated with EGRRCPA, we take either the sum of RCONJH83 and RCONJH84 (Total reciprocal deposits) or RCONG803 (Reciprocal brokered deposits) to construct a consistent series of reciprocal deposits at the bank-quarter level. We define "network" banks as those with positive reciprocal deposits and "non-network" banks as those with zero reciprocal deposits in a given quarter.

[5]For reference, the top 5 counties in 2017 were Lancaster, NE (70%), Denver, CO (67%), Tulsa, OK (63%), Dane, WI (59%), and Fairfield, CT (58%); the bottom 5 were: Worcester, MA (6%), Hamilton, OH (6%), Jackson, MO (7%), La Salle, IL (8%), and McLennan, TX (8%). Network participation rates for large counties ranged from 10% (Middlesex, MA) to 30% (Los Angeles, CA).

Fraction of Uninsured Deposits. Bank-level estimates of the fraction of insured deposits are collected from the FDIC's Statistics on Depository Institutions (SDI). The SDI an advanced feature of the Institution Directory (ID) that provides detailed financial reports. Importantly, it provides estimates for banks with total assets less than $1 billion, which is missing in the corresponding Call Reports data. We construct the fraction of uninsured deposits by subtracting insured deposits (variable *depins*) from total deposits (variable *dep*).

Deposit Rates. We obtain deposit rate data from the S&P Global's RateWatch database. We focus on the 12-month certificate of deposit accounts with a minimum of $10,000 due to its comprehensive reporting coverage. To mitigate bias from misreporting, we first calculate the quarterly average CD rate at the branch level and then aggregate these rates across branches of each commercial bank.

Bank Locations and Deposit Holdings. We compile location and deposit holdings information for bank branches using data from the FDIC's Summary of Deposits (SOD). To address whether the reciprocal deposit network is geographically concentrated, we additionally identify the address for each bank headquarters by supplementing SOD data with the Call Report's Panel of Reporters. Lastly, we construct an annual measure of bank-level branch counts and average deposits per branch.

Bank Valuation Ratios. We calculate the market-to-book ratio of publicly traded bank holding companies (BHCs) using security price data from CRSP and balance sheet data from the FR Y-9C. Specifically, we compute the fraction of the market value of a BHC (shares outstanding multiplied by price) to the book value of total assets.

Other Bank Characteristics. Quarterly bank data on the level of total assets, loans, deposits, equity, and securities, are obtained from the Call Reports. We additionally use the Call Reports to compile interest rate risk information such as the average duration of assets and the maturity gap.

Sample and Descriptive Statistics. The sample period for our study is 2011Q1 through 2023Q4. The maximum deposit insurance limit was permanently raised from $100,000 to 250,000$ in July 2010, which provides support for starting the sample in 2011. The unit of observation used in the study is a bank-quarter pair.

In our main analysis, we study the cross-section of commercial banks that were in operation between 2022Q4 and 2023Q4, the period around the 2023 regional banking crisis. In 2022Q4, the quarter prior to SVB's failure, our sample consists of 4,756 banks, of which 1,539 were classified as network banks.

Table 1 reports summary statistics of network and non-network banks as of 2022Q4. On average, network banks tend to be larger, are less well-capitalized, and have marginally higher profitability. Network banks also have a higher share of loans and lower share of securities in their asset portfolios, implying that operations and investment decisions may have been different across the two groups. Lastly, network banks generally have a lower fraction of insured to total deposits compared to non-network banks. Given that reciprocal deposits mechanically increase the fraction of insured deposits, we interpret this fact as evidence of heterogeneity in banks' willingness or ability to enhance coverage as much as possible.

Figure 7 plots the evolution of six bank characteristics in the pre-BDE (2011 and 2017), Pre-SVB (2022), and Post-SVB (2023) periods. While baseline differences across groups persist, we do not find that the average characteristic and their relationship across the two groups evolve in a notable manner throughout our sample period. This implies that it was unlikely that reasons for joining the network (or costs associated with it) changed meaningfully over time.

5 Main Results

In this section, we examine the financial stability implications of deposit insurance. We first discuss our empirical strategy to analyze how this market-based deposit insurance mechanism influences the behavior of both depositors and banks. We then present the findings from this analysis.

5.1 Empirical Strategy

The primary challenge in studying the effects of deposit insurance is that there is practically no cross-sectional variation in access to deposit insurance coverage across banks within a country. Unlike other bank characteristics, deposit insurance coverage for depositors is typically standardized within a country. Regulators, like the FDIC, set national limits, offering the same level of insurance protection to depositors regardless of their chosen bank. This lack of cross-sectional variation makes straightforward comparisons difficult. Further, simply relating the amount of a bank's insured deposits to depositor or bank behavior may be misleading because other factors might be at play. Changes in coverage limits over time might coincide with broader economic conditions or regulatory shifts, impacting both banks and depositors independently. Similarly, cross-country comparisons face limitations. Differences in regulations and economic structures across nations can confound the analysis of deposit insurance programs.

Our analysis leverages the regional banking crisis of 2023 presents a valuable quasi-experiment for studying the effects of deposit insurance. We employ a bank's presence on the reciprocal deposit network in 2022Q4, i.e., a quarter before the onset of the SVB crisis, as an instrumental variable (IV) for access to higher insurance coverage via reciprocal deposits during the subsequent crisis.

We begin our estimation exercise by relating the network status to the growth in insured deposit of a bank around the regional banking crisis using the following cross-sectional regression model:

First Stage

$$\Delta ln(Ins.Dep)^{j}_{2023Q4,2022Q4} = \alpha + \beta \mathbb{1}_{Network,j,2022Q4} + X_j + \epsilon_j \tag{1}$$

Next we relate the predicted value of change in insured deposit to various outcome variables of the bank in the following second stage regression model:

Second Stage

$$\Delta Y^{j}_{2023Q4,2022Q4} = \alpha + \beta \Delta ln(\widehat{Ins.Dep)}^{j}_{2023Q4,2022Q4} + X_j + \epsilon_j \tag{2}$$

$\Delta ln(Ins.Dep)^{j}_{2023Q4,2022Q4}$ measures the log change in insured deposits for bank j from 2022Q4 to 2023Q4. Y indicates various dependent variables of interest such as total deposit growth, change in number of insured accounts, change in deposit rate, various measures of maturity and interest rate risk, and asset growth. $Network^{j}_{2022Q4}$ equals one if a bank is on the network on 2022Q4, zero otherwise. X_j is a vector of control variables such as bank's asset size, security holdings, and profitability.

This empirical strategy hinges on two key assumptions. The relevance assumption states that banks within the network could offer depositors enhanced insurance compared to those outside, directly influencing depositor and bank behavior during the crisis. The key exclusion assumption is that the decision to join the network before the crisis is unlikely to be influenced by factors specifically affecting depositor behavior or bank risk-taking during the crisis. The setup costs and delays associated with joining the network make it a more credible instrument compared to factors that banks could easily adjust in response to the crisis.

This IV approach, coupled with our focus on the immediate aftermath of the crisis, strengthens our analysis by mitigating concerns about endogenous selection bias. In essence, our instrument focuses on banks' network membership status in 2022Q4, regardless of any subsequent changes. This approach is similar to an intent-to-treat analysis, where the focus is on the initial treatment group assignment rather than the treatment ultimately received. Banks could not quickly join the network in response to the crisis, making pre-crisis network membership a less biased indicator of access to higher deposit insurance coverage during the regional banking crisis. To isolate the effects of deposit insurance further, we control for observable bank characteristics in our analysis, such as pre-crisis bank size, securities holdings, and profitability.

5.2 Network Membership and Deposit Insurance during the Crisis

This section validates our use of network membership as an instrument for access to higher insurance coverage. We demonstrate two key points with prima facie evidence. First, network adoption is a gradual process, making it difficult for banks to join the network solely in response to the crisis in order to gain an immediate advantage. Second, pre-crisis network membership is a critical determinant of deposit and asset growth.

Figure 8 explores the relationship between network expansion and deposit growth following the SVB crisis. Panel 8a plots network adoption and attrition over time for network and non-network banks as of 2022Q1. First, we show that once on the network, banks tend to remain on it by maintaining positive reciprocal deposits (blue bars). Second, while we observe a gradual increase in network membership among non-network banks (orange bars), the growth is muted not only in 2022 but also throughout the banking crisis of 2023. Notably, only 3.3% and 5.7% of pre-crisis non-network banks join the network by the end of 2023Q1 and 2023Q2, respectively – the two quarters immediately following SVB's failure. By 2023Q4, 18% of non-network banks joined the network, highlighting the slow pace of adoption. This is important for our instrumental variable strategy; since joining the network is not a trivial process, it is unlikely that banks could have strategically timed their entry to gain an advantage during the immediate aftermath of the crisis.

Panel 8b further emphasizes the benefits of network membership, demonstrating the distinct difference between the reciprocal deposit growth for network and non-network banks. The total value of reciprocal deposits for banks already on the network by 2022Q1 remains relatively stable at around $130 billion throughout 2022. However, the network banks' reciprocal deposit volume increases significantly starting in 2023Q1. The total volume more than doubles 2023Q1 to $273 billion, and continues to rise throughout the year, indicating that existing members took advantage of the network's deposit insurance benefits during the crisis. Indeed, we observe that the surge in reciprocal deposit activity directly translates to a significant increase in both the amount and the proportion of insured deposits for network banks but not for non-network banks (Panels 8c and 8d). Notably, Panel 8d shows that the gap in the insured deposits ratio between network and non-network banks decreased significantly between 2022Q4 and 2023Q2 (4.4% to 1.2%).

Furthermore, our analysis indicates that pre-crisis network membership is a key determinant of a bank's insured deposit growth during the crisis. This increase in insured deposits, in turn, positively impacts overall deposit growth and total asset growth, as shown in Figure 9. These facts underscore the significant impact of network access on a bank's financial health – affecting both the liabilities and assets – when the value of deposit insurance increases during a crisis. In the next section, Section 5, we explore these findings in greater depth and discuss their broader implications.

Overall, our findings indicate that that network status is a key determinant of deposit growth, particularly during a crisis. The slow adoption rate and pre-crisis stability in deposit growth among network banks strengthen our argument that network membership is a valid instrument for access to higher deposit insurance coverage.

5.3 Depositor Behavior

We start our analysis by characterizing how deposit insurance affects depositor behavior using our empirical strategy. Table 4 presents the results of our estimation.

In column (1), we report the first stage results, according to Equation 1. We examine how pre-crisis network membership, in 2022Q4, relates to insured deposit growth during the crisis, between 2022Q4 and 2023Q4. We find that banks on the network in 2022Q4 experienced a 7.73 percentage points higher growth in insured deposits during the crisis relative to non-network banks. Given the quarterly growth rate of 1.04 percentage points for total insured deposits of all U.S. banks from 2010, our estimate of 7.73 percentage points over the course of 3 quarters is economically significant.

Figure 9 examines the dynamics of insured deposit growth between network and non-network banks. Panel 9a shows the quarter-by-quarter growth rate of insured deposits for these two groups from 2022Q1 to 2023Q4. A stark pattern emerges: network banks began to experience higher growth in insured deposits in 2022Q4, with a significant spike during the peak of the crisis in 2023Q1. The data reveals a substantial divergence between network and non-network banks at this point: throughout 2023Q1, insured deposits at network banks grew by 7.2%, whereas non-network banks had a much lower growth rate of 2.4%. By 2023Q4, as concerns about the crisis subsided, the quarterly growth rates for both groups began to converge again. Despite this, the cumulative difference in growth between network and non-network banks over this period remained substantial, as depicted in Figure 9b. From 2022Q1 to 2023Q4, network banks achieved insured deposit growth of 17.9%, compared to just 7.1% for non-network banks – a gap of 10.8%. This gap highlights the pronounced impact that network membership has on insured deposit growth, particularly during times of financial uncertainty.

Together, these results establish the economic importance of our instrument: a presence on the network enabled these banks to retain or attract insured deposits through the use of reciprocal deposits.

A key question arises: is the observed increase in insured deposits merely a reshuffling of previously uninsured deposits into insured status for network banks, or does it indicate a broader ability to attract more deposits overall? We address this question by estimating the impact of network status on the growth rate of total deposits from 2022Q4 to 2023Q4. The regression result, shown in column (2) of Table 4, indicates that the total deposits for network banks increased at a 4 percentage points higher rate compared to non-network banks. This suggests that access to enhanced deposit insurance coverage through the network not only helps these banks retain existing deposits but also attract additional deposits overall.

Next, we estimate the second stage regression model, according to Equation 2. Column (3) of Table 4 presents the estimate of the second stage regression model: we find that the elasticity between the growth rate in insured deposits due to access to the reciprocal deposit market and the bank's overall total deposit growth rate is 0.52. This indicates that a 1 percentage point increase in the growth rate of insured deposits obtained via the reciprocal deposit market translates to a 0.52 percentage point increase in the bank's total deposit growth rate. This elasticity is similar to the

OLS estimate we obtain in column (4), from regressing total deposit growth on insured deposit growth. Columns (5) through (8) reproduce these results after controlling for the bank's asset size, securities holdings, and profitability. Even after accounting for these variables, the results remain statistically significant and quantitatively similar.

The middle panels of Figure 9 provides additional insight into the dynamics of total deposit growth for both network and non-network banks. Panel 9c shows that network banks experienced an increase in total deposits whereas non-network banks experienced a decline in total deposits, a result that is more prominent in the immediate aftermath of the crisis. This finding highlights the heterogeneous response of depositors to a sudden shift in the importance of insurance coverage. Banks that had access to reciprocal deposits were able to grow their deposits in absolute terms despite the heightened scrutiny on banking sector risk. The significant difference in the deposit growth trajectories of network and non-network banks has a notable cumulative impact. As shown in Panel 9d, network banks had a cumulative growth advantage of 5.5% in total deposits compared to non-network banks by the end of 2023 (off the baseline in 2022Q1).

Complementing our analysis of deposit growth, we examine how network membership influenced the number of deposit accounts in Table 5. This provides another lens into depositor behavior during the crisis, particularly regarding potential account closures associated with depositor runs. The results are consistent with our prior findings. Column (2) of the table shows that network banks experienced a 4 percentage points higher growth rate in the total number of insured accounts compared to non-network banks. This estimate is consistent with the observed increase in deposit amounts. Moreover, the elasticity in column (3) suggests that a 1 percentage point rise in the growth rate of insured deposits obtained through the network translates to a 0.53 percentage point increase in a bank's total number of insured accounts. Similar to the deposit amount analysis, these findings remain robust to alternative specifications and controlling for confounding factors in columns (4) through (8). Our results suggest that network banks were not only able to retain existing deposits but also potentially attracted new depositors during the crisis.

Overall, these results demonstrate that the depositors of the network banks were less likely to leave their banks because of the enhanced access to deposit insurance.

5.3.1 Interest Rates of Deposits:

Interest rates on deposits are influenced by a combination of factors including the market rate on safe assets, the competitiveness of the banking sector, and the availability of deposit insurance. Our empirical framework enables us to isolate the impact of enhanced deposit insurance on the deposit interest rates that banks offer and customers accept. We investigate how access to a network's enhanced deposit insurance affects the interest rates banks offer on their deposit products to attract and retain depositors.

A key challenge of simply regressing changes in the deposit rate on changes in insured deposits is potential endogeneity. This arises because banks might raise deposit rates not just in response to having more insured deposits, but also to attract them in the first place. Additionally, unobserved factors like a bank's overall health or economic conditions could influence both variables. To address this, we employ the IV strategy outlined in Section 5.1 to isolate the causal effect of deposit insurance on rates. Our first stage is described in Equation 1, and the second stage is described in Equation 2. The second stage model examines changes in interest rates for a specific product: 12-month Certificates of Deposit (CDs) with a minimum deposit size of $10,000. These CDs are particularly appealing to risk-averse savers due to their FDIC-insured status. In times of crisis, such as the recent SVB crisis, depositors can choose among several banks for CD products, which often prompts banks to raise interest rates on time deposits to attract business. Time deposits are also known to be more sensitive to bank risk (Martin et al., 2018).[6]

We conjecture that depositors might accept a slightly lower interest rate on CDs in exchange for the additional security provided by enhanced deposit insurance through reciprocal deposits. The objective of our empirical model is to quantify this effect, estimating the elasticity between the quantity of insured deposits and the interest rate offered. This estimation helps determine how much insurance coverage influences depositors' interest rate expectations and banks' interest rate offerings.

The estimation results are provided in Table 6 of the paper. Columns (2) and (6) provide the reduced form estimates linking network status to changes in deposit rate: banks on the network lowered their interest rate by 9 to 16 basis points compared to the non-network banks. The second stage estimates, presented in Columns (3) and (7), show that 1 percentage point higher growth in

[6] Our results remain robust across other deposit products.

insured deposits can lead to a reduction in interest rates of up to 2.27 basis points offered by the bank.[7]

5.3.2 Cross-Sectional Variation

Which banks benefit more from access to enhanced deposit insurance? There are two competing views on what drives bank runs: A sunspot view of the depositor run where the key driver of a bank run is the coordination failure of depositors (Diamond and Dybvig, 1983), and a fundamental based view where bank runs are a result of deteriorating fundamentals (Jacklin and Bhattacharya, 1988; Calomiris and Mason, 1997). In between these two views is the idea that banks can end up in bad equilibrium due to deteriorating fundamentals (Allen and Gale, 1998; Goldstein and Pauzner, 2005). If a banking panic ensues, do all banks benefit equally or do those with deteriorating fundamentals gain more from access to enhanced insurance? Correia et al. (2023) study the drivers of U.S. bank failure over a long period of history, and conclude that deteriorating fundamentals play a significant role in predicting bank failures.

Motivated by these arguments, we ask whether the effect of access to the reciprocal deposit market varies with a bank's fundamentals during a crisis. Our setting is unique in terms of shedding light on this debate: we are able to observe a cross-section of banks with varying degree of fundamental shock during a period of banking crisis and only some of them could get enhanced coverage. If all banks, regardless of their fundamentals, benefited equally from access to enhanced coverage then our results would be consistent with a purely panic based interpretation. On the other hand, if banks with worse fundamentals benefit more then our results would be consistent with the other two mechanisms. We measure a bank's fundamental strength by their market-to-book ratio.

Figure 10 compares the use of reciprocal deposits across small, midsize, and large BHCs. Within each category, we classify BHCs into "high M/B" and "low M/B" using the median market-to-book (M/B) ratio as the cutoff. Since 2010, the fraction of reciprocal deposits among high M/B and low M/B banks were similar, following a common trajectory until SVB's failure in 2023Q1. After SVB's failure, however, BHCs with low M/B ratios significantly increased their use of reciprocal deposits relative to BHCs with high M/B ratios. This effect is particularly pronounced among small and midsize BHCs, which is consistent with our results in Tables 2 and 3.

[7]The positive coefficient associated with the OLS models of columns (4) and (8) strengthens concerns of endogeneity.

For small BHCs, those with high M/B ratios reported an average reciprocal deposit share of 4.3% in 2022Q4, compared to 4.7% for small BHCs with low M/B ratios (gap of 0.4%) before the SVB failure. For midsize BHCs, the trend is similar: high M/B BHCs had an average ratio of reciprocal deposits to total deposits of 1.8% in 2022Q4, while low M/B BHCs reported 2.4% (gap of 0.6%) before the SVB failure.[8] In the two quarters following SVB's failure, the gaps in reciprocal deposit shares between the low and high M/B groups for small and midsize BHCs increase significantly to 4.1% and 5.5%, respectively. This sudden shift implies that conditional on network status, BHCs with lower M/B ratios were more inclined to leverage reciprocal deposits as a risk management strategy during the crisis period.

We rigorously test these relationships through a cross-sectional regression model. In Table 7, we regress banks' deposit growth from 2022Q4 to 2023Q4 on their market-to-book ratio as of 2022Q4, network status as of 2022Q4, and an interaction term between the market-to-book ratio and network status. This interaction term helps us assess whether network access allowed banks with relatively weaker fundamentals to grow their deposits more during the crisis. Column (1) presents our baseline results, while Column (2) includes control variables for bank size, securities holdings, and profitability. We find a positive and significant effect for the Network variable but a strong negative coefficient for the interaction term. This implies that the effect of network access is more pronounced for banks with lower market-to-book ratios, suggesting that enhanced deposit insurance is particularly valuable for banks with higher default risk. These findings are consistent with the fundamentals-based view of bank runs, indicating that enhanced deposit insurance may be more effective at preventing deposit outflows in banks experiencing deteriorating fundamentals. Thus, network membership appears to offer relatively more benefits to banks with weaker financial positions during crisis periods.

5.4 Bank Behavior

We investigate the effect of enhanced deposit insurance on banks' risk-taking behavior using the same framework we employed to study depositor behavior. Our focus is on interest rate risk for two primary reasons. First, during the SVB crisis, exposure to interest rate risk was a major concern for market participants and regulators. Therefore, a bank's exposure to this risk and its evolution over time is economically important. Second, unlike credit risk, interest rate risk

[8] For large BHCs, the distinction between high and low M/B is less pronounced due to low participation, with high M/B banks reporting an average ratio of reciprocal deposits to total deposits of less than 0.1% before the SVB failure.

can be measured more precisely at the time of the event. For example, interest rate risk can be measured by analyzing the maturity structure of a bank's assets and liabilities, which provides a direct assessment. In contrast, reliable measures of credit risk require observing actual borrower repayment behavior, often resulting in a time lag.

We use two measures to quantify interest rate risk: (a) the duration of securities held by banks and (b) the one-year maturity gap between a bank's assets and liabilities. We calculate the duration of securities by taking a weighted average of the volume of securities in each maturity category, with weights based on the average maturity within each category. The one-year maturity gap is calculated according to Purnanandam (2007), by subtracting the total liabilities that are due to reprice or mature within a year from the corresponding total for assets. Since our focus is on risk-taking behavior linked to deposit insurance, we exclude deposits from the maturity gap calculation.

Results on duration risk are provided in Table 8. The dependent variable is the log change in the duration of securities from 2022Q4 to 2023Q4. The reduced form estimates in columns (2) and (6) indicate that network banks decreased the duration of their securities holdings by up to 3.88 percentage points. Our main interest is in the second stage estimates, examining the impact of increased deposit insurance on the duration of securities. We find an elasticity of 0.53, significant at the 1% level, in Column (3). This suggests that a one percentage point increase in deposit insurance coverage is associated with a 0.53 percentage points increase in the duration of network banks' securities portfolios. In Column (7), the statistical significance weakens slightly when we control for the bank's asset size.

Our analysis in Table 9, Panel A, explores whether banks with enhanced deposit insurance exhibited a greater tendency to increase their risk exposure through interest rate imbalances. We focus on the extensive margin, examining if banks are more likely to widen their absolute maturity gap (the absolute value of the difference between short-term assets and liabilities). Columns (2) and (6) show that network banks were 5 to 6 percentage points more likely to increase their absolute maturity gap between 2022Q4 and 2023Q4 compared to non-network banks. This suggests a greater imbalance in the maturities of their assets and liabilities, potentially indicating a rise in interest rate risk. The second stage estimates in columns (3) and (7) delve into the impact of deposit insurance growth on the probability of a bank increasing its gap. These results suggest that a 1 percentage point increase in insured deposit growth leads to an up to 0.86 percentage point higher probability of an network bank increasing its maturity gap. This effect is roughly

1.75 times greater than the average probability observed during our study period.

Panel B investigates the intensive margin, focusing on the magnitude of change in the maturity gap for banks with varying levels of deposit insurance. The results, particularly in Columns (5) through (8) which control for bank size, reveal a positive relationship. We find in column (6) that network banks increase their maturity gap by 4.5 percentage points, on average between 2022Q4 and 2023Q4. Additionally, Column (7) suggests that a 1 percentage point increase in insured deposit growth is associated with a 0.63 percentage point increase in the maturity gap for these banks – similar to the OLS estimate obtained in column (8).

Collectively, these findings suggest that banks receiving a larger influx of insured deposits during the crisis period also exhibited a potential increase in interest rate risk. This is evidenced by a higher likelihood of widening their maturity gap and a larger increase in the gap for banks with greater deposit insurance growth. Note, however, that we do not assess whether this increase in interest rate risk is an efficient outcome.

5.5 Banking Market

Market-based 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. If smaller banks can retain their depositors through reciprocal deposits, it could have significant implications for the economy. Depositors could build deeper relationships with one or two banks instead of maintaining multiple banking relationships solely for higher insurance coverage. This could, in turn, influence the volume and type of loans banks issue.

However, the impact of reciprocal deposits on the overall banking market remains an empirical question. Some might argue that access to higher deposit insurance simply redistributes existing liabilities within a bank, leaving its overall asset size unchanged. For example, a bank might use the network to shift uninsured deposits to the insured category, with no net change in total assets. On the other hand, enhanced insurance could enable banks to grow by issuing more loans and holding additional securities.

The bottom panel of Figure 9 plots the evolution of total assets growth in percentage terms at network and non-network banks over time. A stark pattern emerges from the plot: during the SVB crisis, network banks expanded, while non-network banks exhibited low or even negative growth. Cumulatively, by the end of 2023Q4, network banks had grown their assets by 10.1% from 2022Q1 to 2023Q4, compared to only 4.8% for non-network banks.

To formally assess the influence of deposit insurance access on asset growth, we employ the same IV strategy used to analyze depositor and bank behavior. Table 10 reports the results. The dependent variable is the log change in total assets for a bank between 2022Q4 and 2023Q4. The reduced form estimates in Columns (2) and (6) indicate that network banks experienced an additional 2.36% to 3.28% growth in assets during this period. These estimates are statistically significant at the 1% level, suggesting a robust effect. The second stage estimates in columns (3) and (7) indicate an elasticity of 0.43. This implies that a 1 percentage point increase in insured deposits is associated with a 0.43 percentage points higher growth rate in a bank's size.

These results are important for policy debates as well as for understanding the effect of deposit insurance on market structure.

5.6 Robustness Tests

Our baseline analysis relies on the assumption that banks not already part of the reciprocal deposit network when the SVB crisis occurred would face significant setup costs and time delays in joining the network. This raises the question: are our results driven by selection of banks on the network?

To mitigate this concern, our main analysis leverages changes in outcomes like insured deposits, asset-liability gaps, and bank size around the crisis period. This approach focuses on changes rather than fixed characteristics of banks, reducing the influence of pre-existing differences. Additionally, we control for bank size and security holdings in our regressions, further accounting for their independent effects on changes in outcomes. Therefore, our results are unlikely to be driven by differences in deposit outflows among banks of varying sizes or those with different securities portfolios during this period.

To further reduce concerns about selection bias, we provide two additional robustness tests to strengthen the reliability of our results.

5.6.1 Excluding large banks

In our first robustness test, we exclude the largest banks with more than $100 billion in assets from the sample. The main motivation behind this exercise is to remove concerns such as special circumstances of some of the largest banks of the country from affecting our results. For example, soon after the onset of the regional banking crisis, depositors began to move their money to some of the largest banks to access the implicit guarantee that these banks enjoy. Further, some of the largest banks were implicitly or explicitly providing support to the struggling banks at the time. For example, JP Morgan Chase acquired the failed First Republic Bank in March 2023. By excluding the largest banks of the economy, we ensure that our results are not driven by these considerations. The results of this robustness test are presented in Table 11. All our results remain robust to the exclusion of the largest banks from the sample.

5.6.2 Matched sample

To address the concerns that network and non-network banks can be fundamentally different, we additionally construct a matched sample of banks for our main analysis. For each bank in the network as of 2022Q4, we find a comparable non-network bank with similar size (measured using total assets) and the securities to total assets ratio. The independent variable is network status of 2022Q4 and we use the change in the insured deposit ratio between 2022Q4 and 2023Q4 as the outcome variable for treated (network) and control (non-network) groups. We use the single nearest-neighbor matching method with replacement and common support. We conduct this exercise to ensure that our results are not driven by differential sensitivity of banks with different asset sizes and security holdings to the SVB crisis.[9]

The estimation results are provided in Table 12 of the paper. Our results on depositor behavior remains very similar to the full sample results. In terms of risk-taking implications, the matched sample results align with the direction of our full-sample results, albeit with weaker statistical significance in some cases. Specifically, we find an increase in the maturity gap for network banks in the second stage regression estimates, but the change in the duration of security holdings is not statistically significant. Overall, these results suggest that much of the increased risk-taking occurs through a mismatch in the maturity and repricing of a bank's assets and liabilities as it receives more inflow of insured deposits.

6 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 unifor-

[9] In unreported balance tests, we verify the equality of means in the two samples' matching variables.

mity 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 larger insurance coverage without requiring depositors to open multiple accounts with other institutions. In this paper, we study the economic implications of such market-based insurance programs.

While an extensive literature exists on traditional deposit insurance programs, our understanding of market-based provisioning of deposit insurance is limited. Since there is no theoretical limit to the amount of deposits that can be insured under this new system, market-based enhancements in insurance coverage can potentially have positive and negative effects. On the one hand, it 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 market-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 can change the dynamics of bank-client relationships, as larger clients no longer need to maintain multiple banking relationships to increase insurance coverage. Consequently, market-based deposit insurance could have significant long-term implications for the economy.

Our paper provides one of the first comprehensive analyses of the reciprocal deposit insurance market, using the regional banking crisis as an experimental setting and the presence on the reciprocal deposit network as an instrument for access to enhanced market-based coverage. Our findings suggest that depositors are less likely to withdraw their money from banks with access to reciprocal deposits. In fact, banks with such access grew their deposit base around the time of the SVB crisis, while those without access experienced deposit outflows. Network banks grew larger during this period, indicating that the increased deposits were not necessarily used by these banks to substitute other sources of funding. Instead, we find evidence that these banks invested the additional funds in assets with higher interest rate risk.

Collectively, our results suggest that market-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 we do not evaluate the overall welfare impact of these effects, our findings can inform future analyses and guide policy design for deposit insurance markets.

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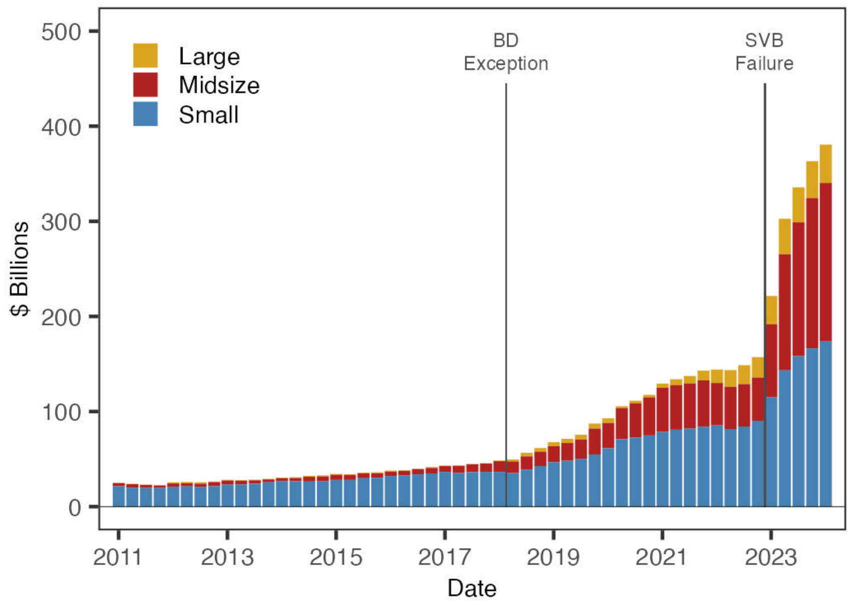
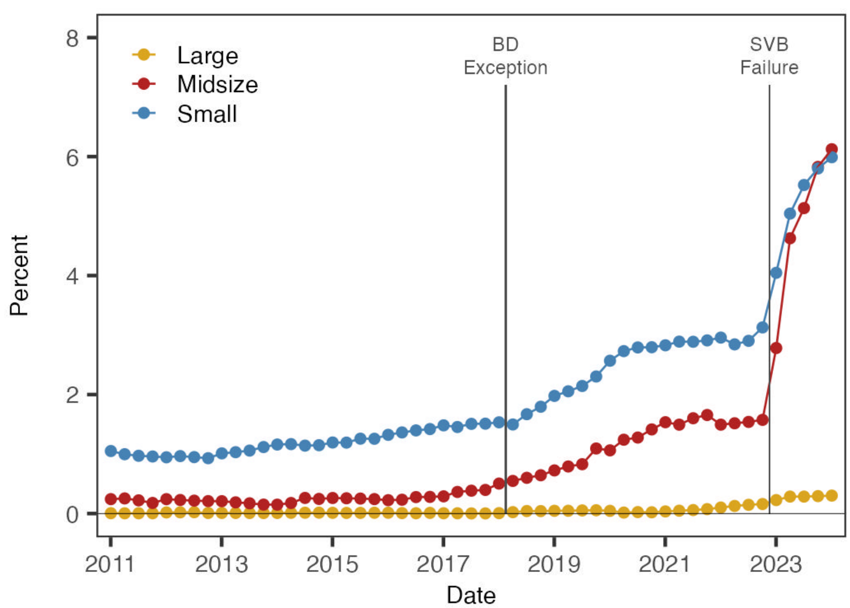
Figure 1: Reciprocal Deposits in the U.S. Banking System

(a) Reciprocal Deposits by Volume

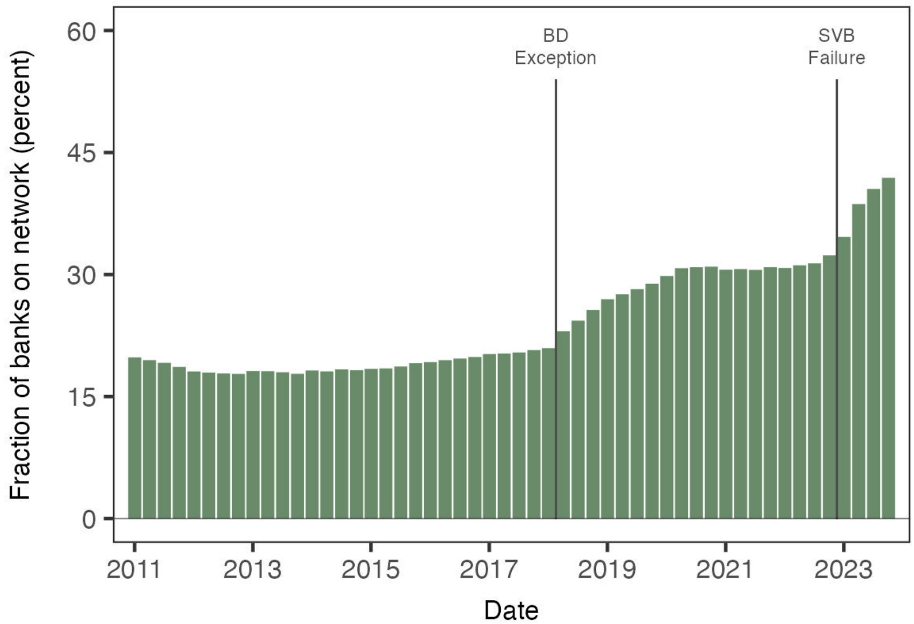


(b) Reciprocal Deposits to Total Deposits



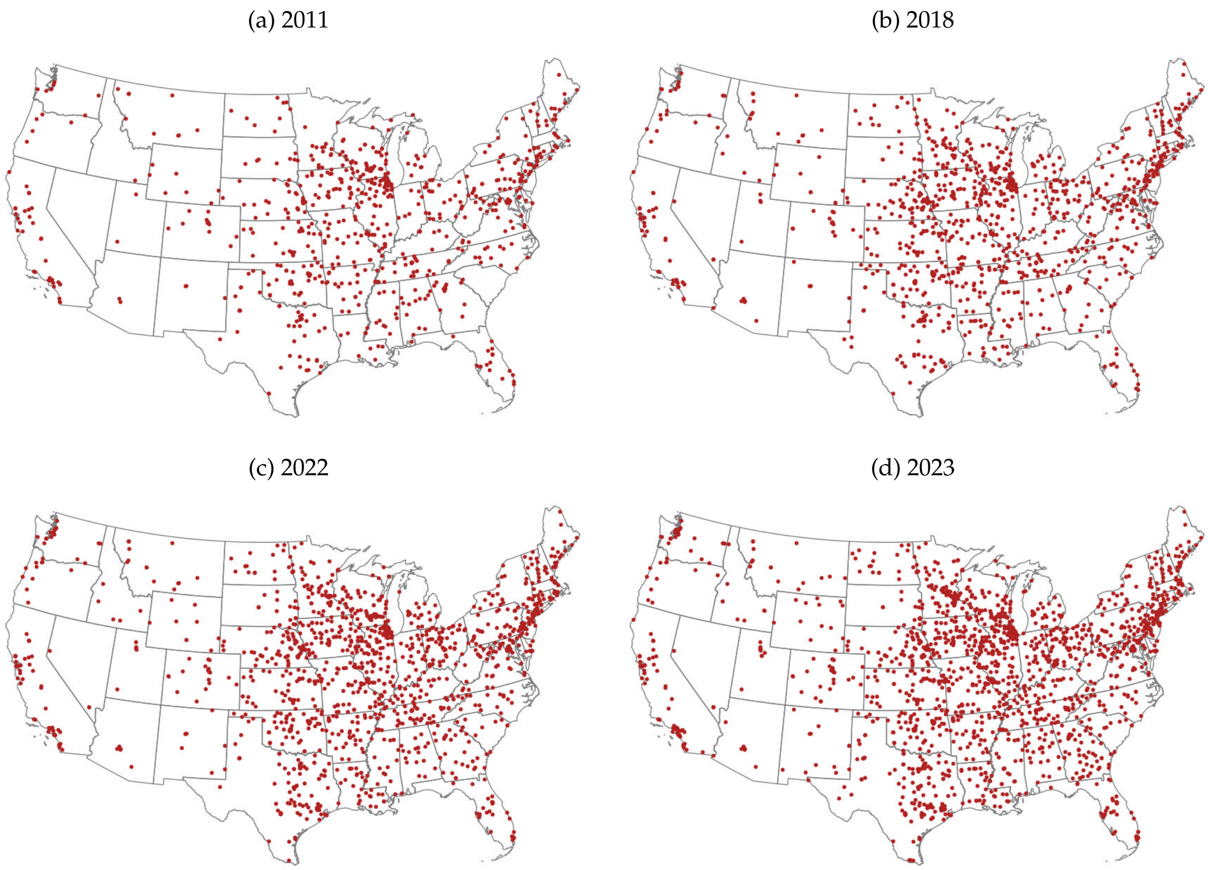
Notes: This figure plots the evolution of reciprocal deposits between 2011Q1 and 2024Q1, both in terms of volume (top panel) and as a share of total deposits (bottom panel). "Large," "Midsize," and "Small" banks refer to banks with more than $100 billion in assets, between $10 billion and $100 billion in assets, and less than $1 billion in assets, respectively. "BD Exception" 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 fraction of banks with positive reciprocal deposits ("network banks") between 2011Q1 and 2024Q1. "BD Exception" 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.

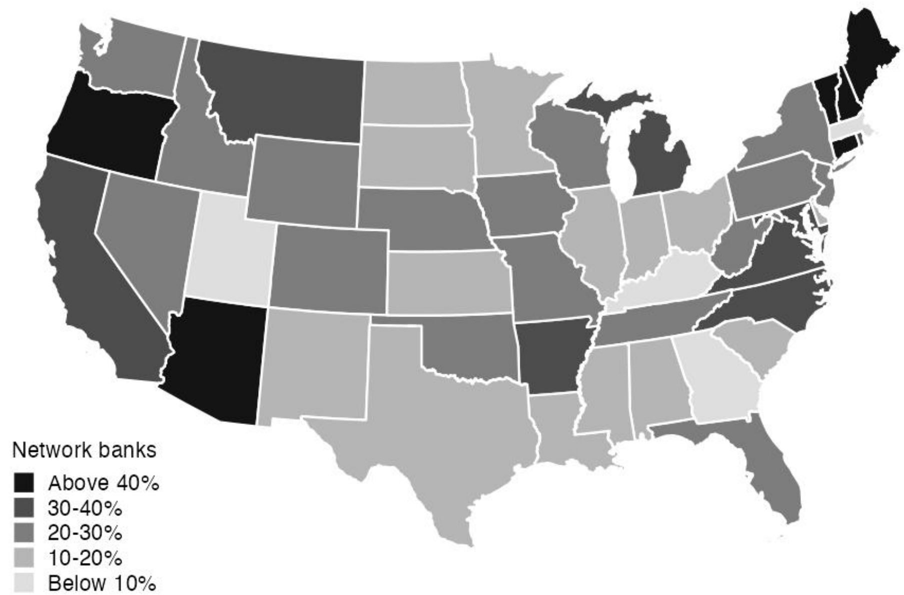
Figure 3: Geographic Expansion of the Reciprocal Deposit Network



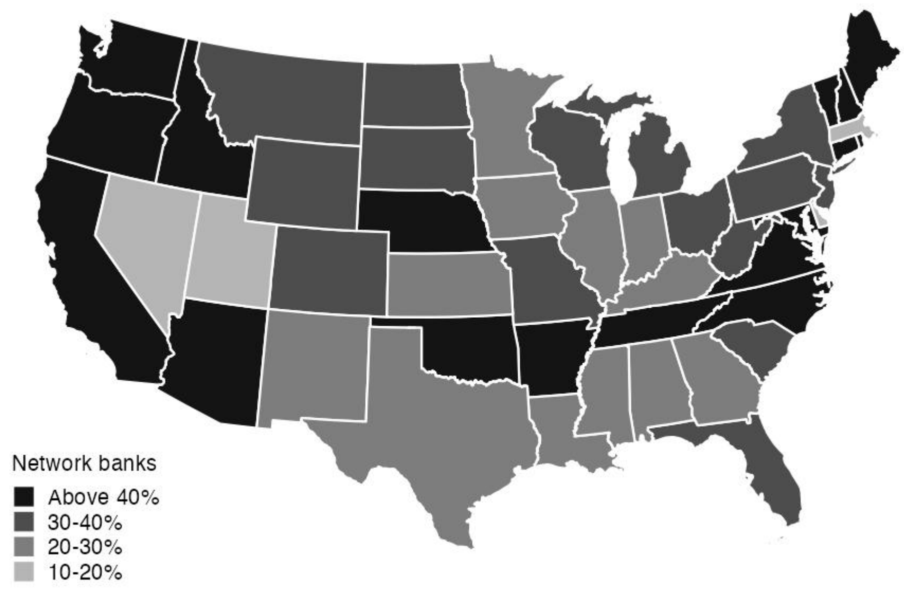
Notes: This figure plots the geographic distribution of reciprocal deposit network banks as of Q4 of 2011, 2018, 2022, and 2023. Network banks are defined as banks with positive reciprocal deposits. Each point corresponds to the location of a bank's headquarters.
Source: Call Reports.

Figure 4: Network Participation Across States

(a) 2017



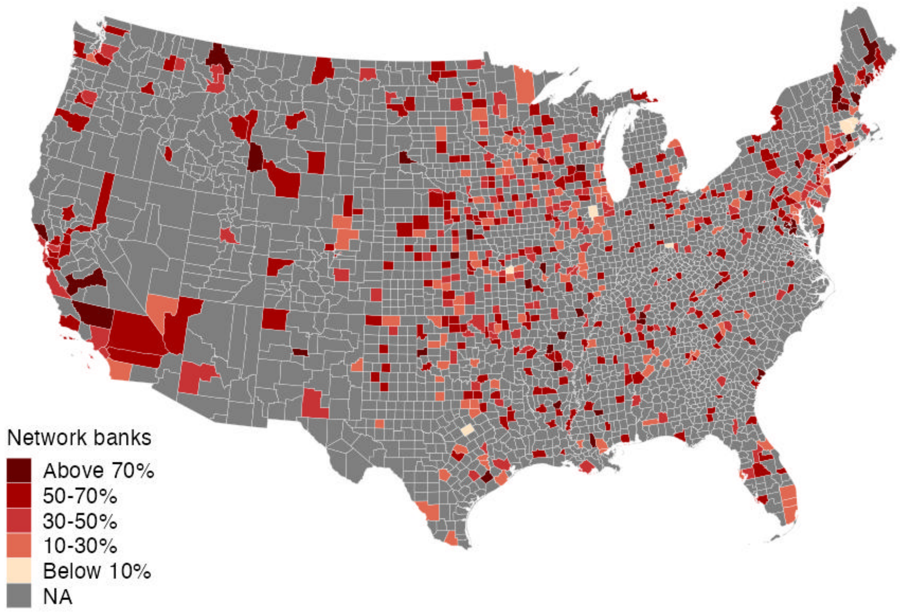
(b) 2022



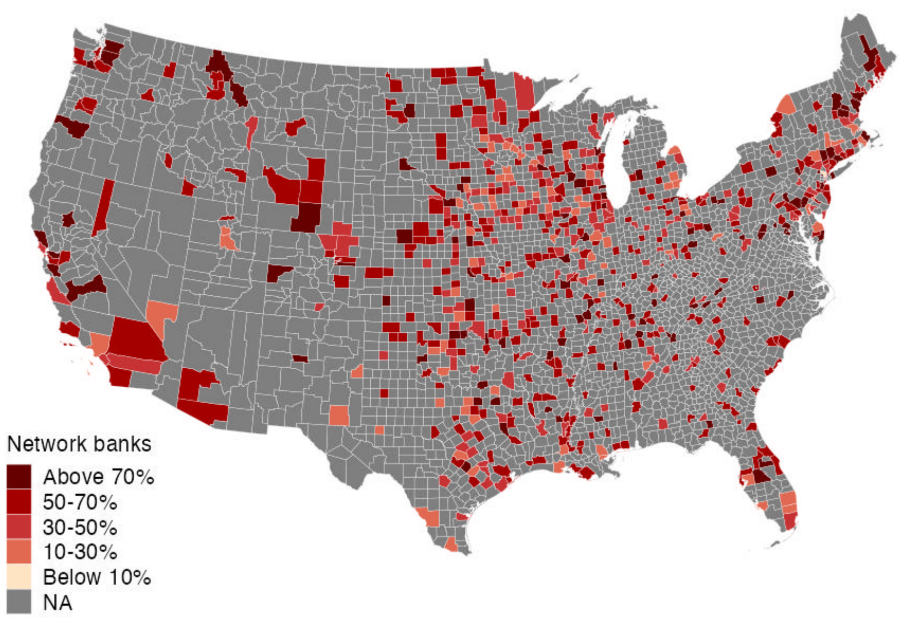
Notes: This figure plots the fraction of reciprocal deposit network banks by state in 2017Q4 and 2022Q4. Network banks are defined as banks with positive reciprocal deposits. Bank locations are determined using the address of the main office.
Source: Call Reports.

Figure 5: Network Participation Across Counties

(a) 2017



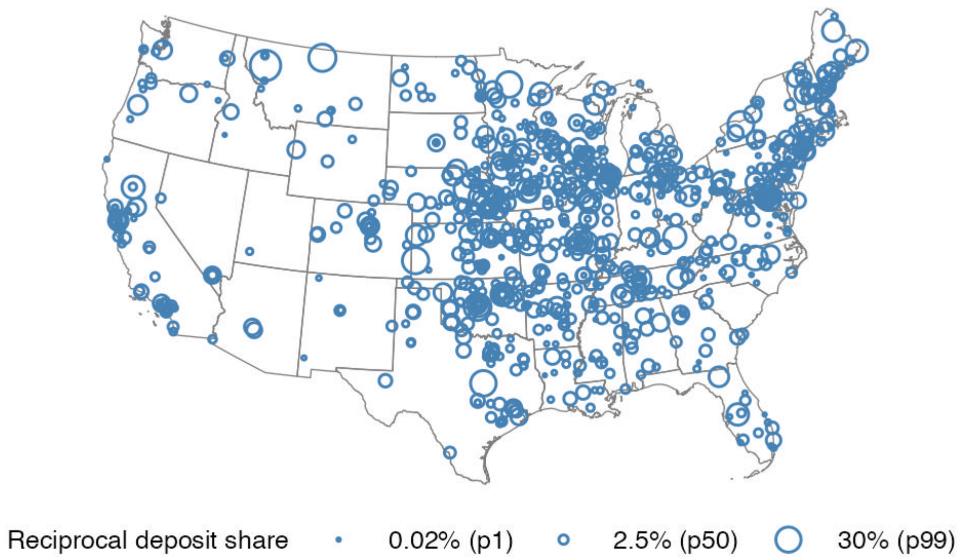
(b) 2022



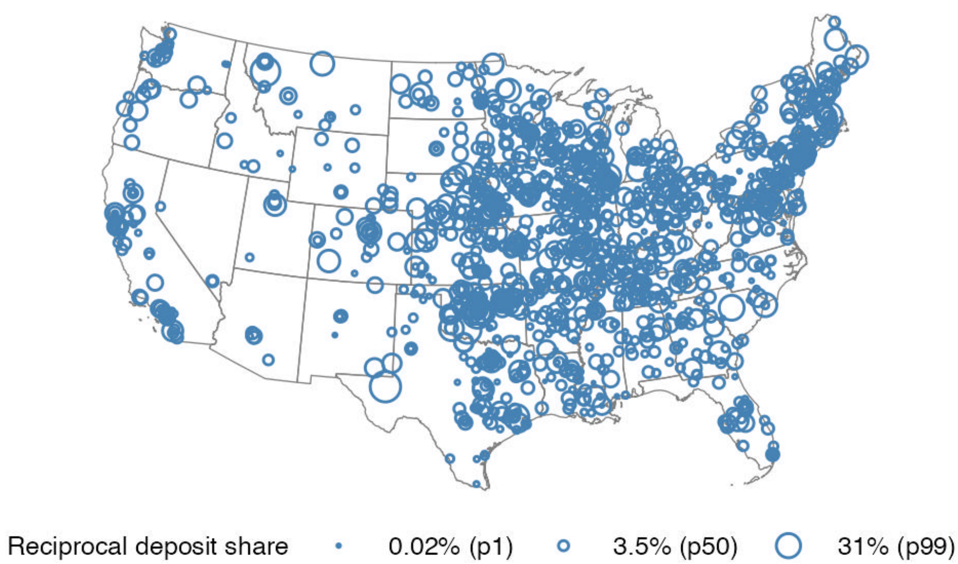
Notes: This figure plots the fraction of reciprocal deposit network banks by county in 2017Q4 and 2022Q4. Network banks are defined as banks with positive reciprocal deposits. Bank locations are determined using the address of the main office and counties with at least two incorporated banks are included.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

Figure 6: Bank Reliance on Reciprocal Deposits

(a) 2017

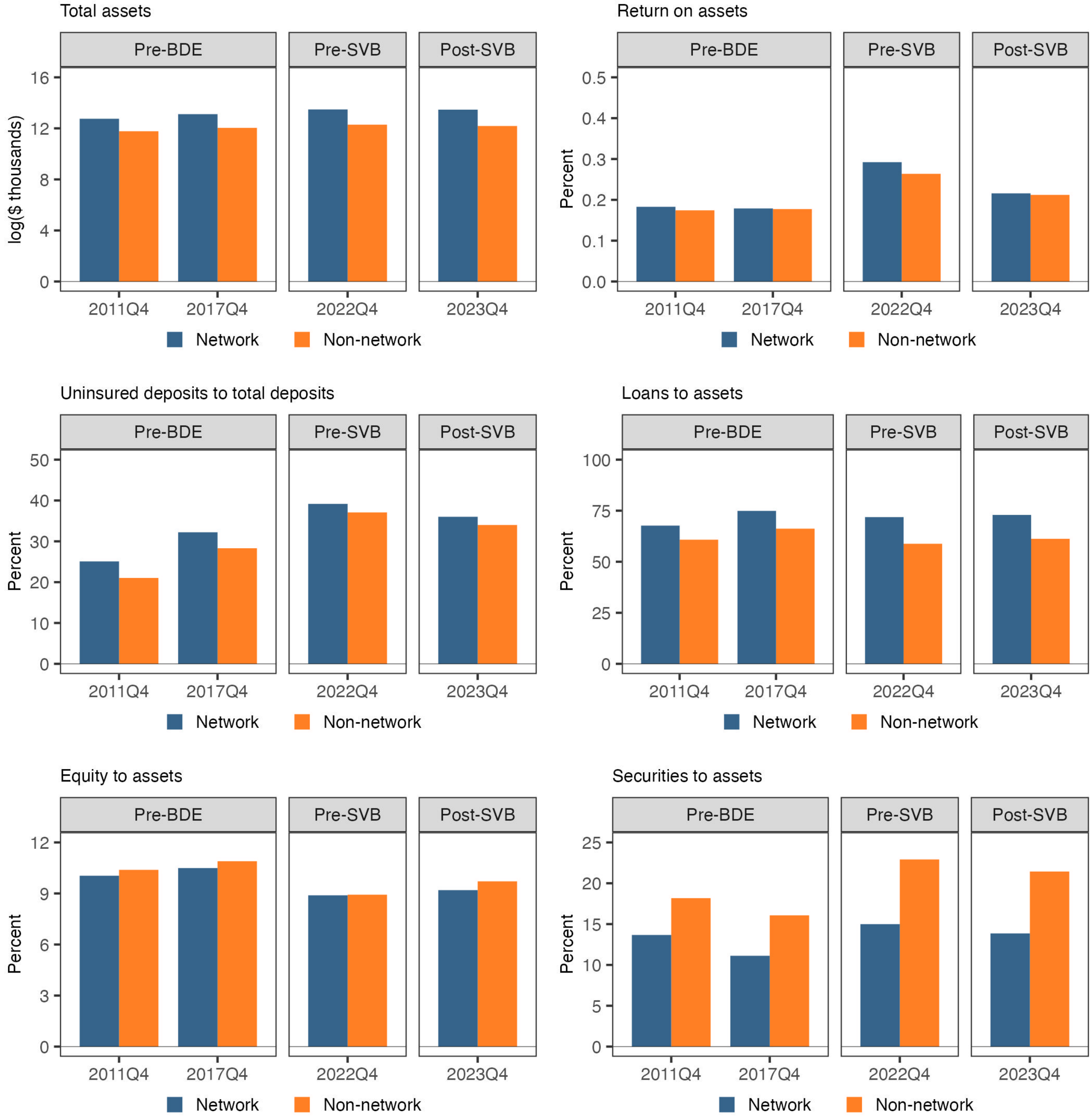


(b) 2022



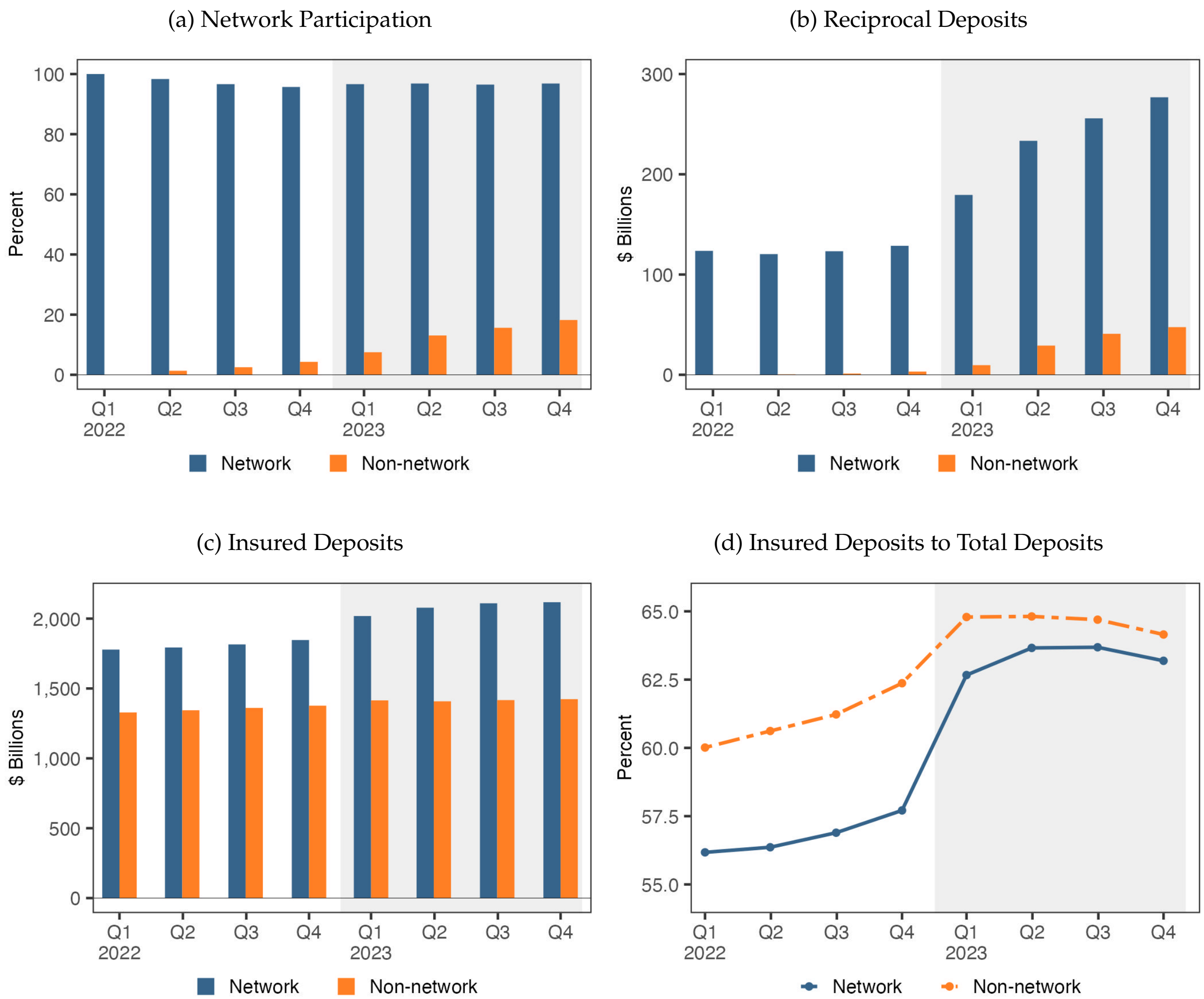
Notes: This figure plots the geographic distribution of network banks as of 2011Q4 and 2023Q4, ranked by each bank's reliance on reciprocal deposits. Network banks are defined as banks with positive reciprocal deposits. Each circle corresponds to the location of a bank's headquarters. The size of each circle represents the reciprocal deposits to total deposits ratio (percent).
Source: Call Reports.

Figure 7: Network Status and Bank Characteristics



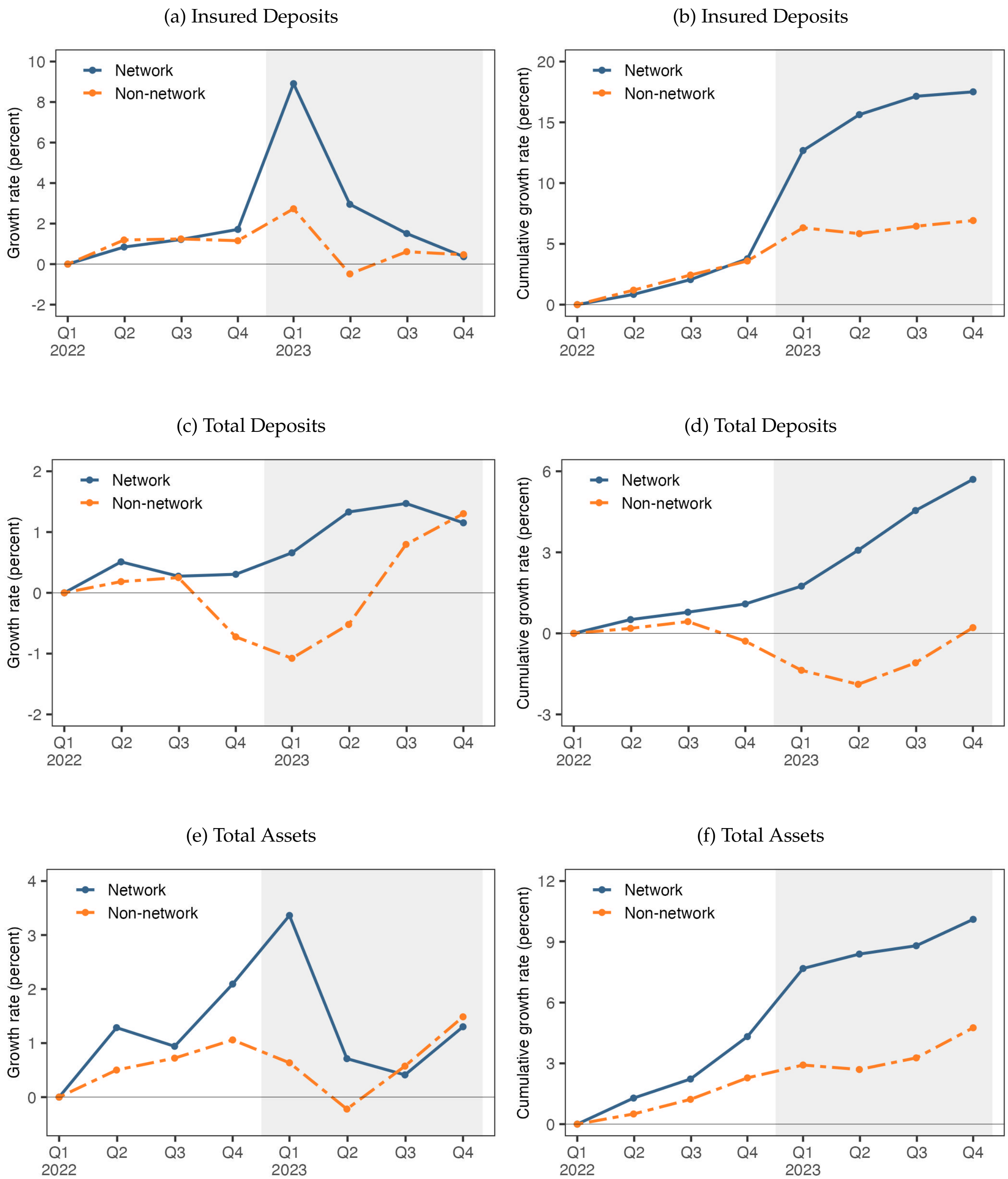
Notes: This figure plots the median of six characteristics of network and non-network banks in 2011Q4 and 2017Q4 (prior to the brokered deposit exemption), 2022Q4 (pre-SVB crisis), and 2023Q4 (post-SVB crisis). The sample includes small and midsize banks (less than $100 billion in assets) that were active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

Figure 8: Network Adoption and Reciprocal/Insured Deposit Growth



Notes: The top-left panel plots the transition of network status for network and non-network banks in 2022Q1. The top-right panel plots the growth of total reciprocal deposits by each group. The bottom panels plot the growth of insured deposits, both in terms of dollar amounts and as a share of total deposits. The sample includes small and midsize banks (less than $100 billion in assets) that were active between 2011Q1 and 2023Q4. The grey shaded area denotes the period after SVB's failure.
Source: Call Reports.

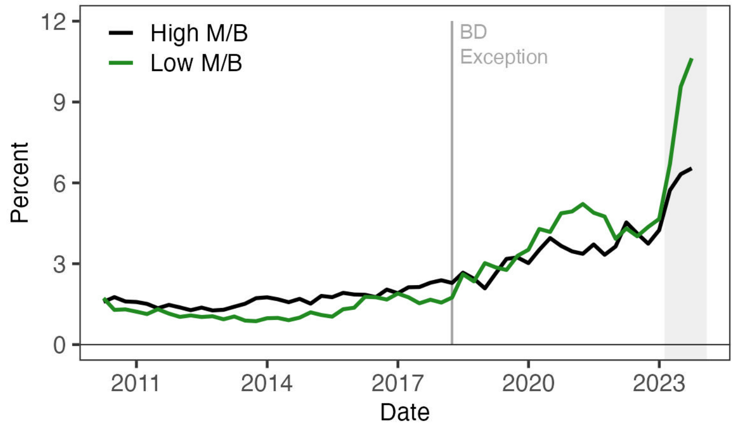
Figure 9: Deposit and Asset Growth by Network Status



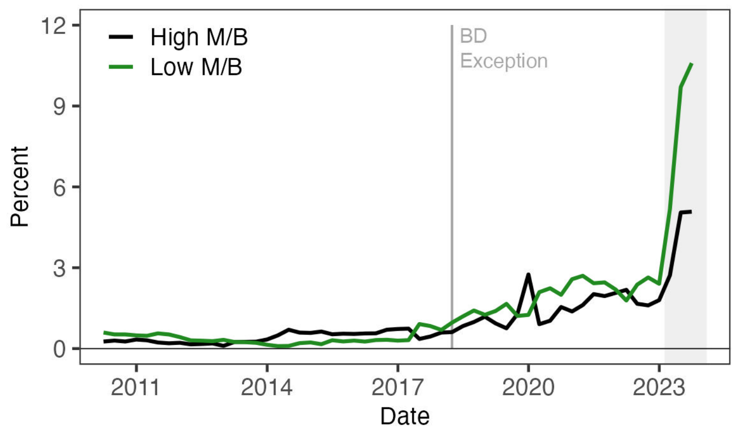
Notes: The top panels plot the quarterly change in insured deposits at network and non-network banks. The middle panels plot the quarterly change in total deposits. The bottom panels plot the quarterly change in total assets. Network status is measured in 2022Q1. The sample includes small and midsize banks (less than $100 billion in assets) that were active between 2011Q1 and 2023Q4. The grey shaded area denotes the period after SVB's failure.
Source: Call Reports.

Figure 10: Bank Valuation and Reciprocal Deposit Growth

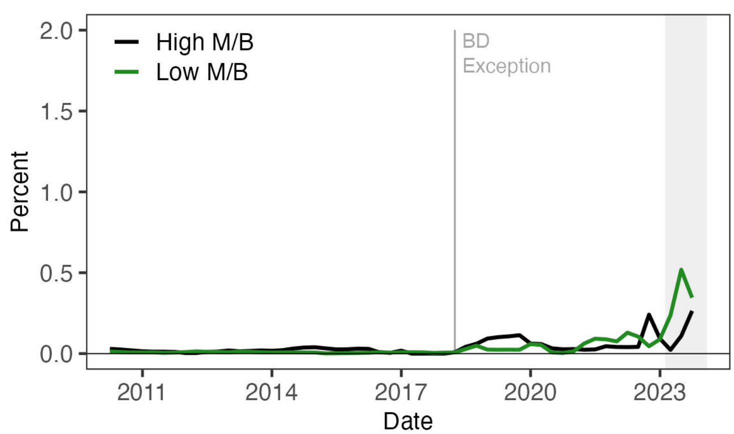
(a) Small Banks



(b) Midsize Banks



(c) Large Banks



Notes: This figure plots the ratio of reciprocal deposits to total deposits for publicly traded banks with above- and below-median market-to-book value ratios. "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 \$1 billion in assets, respectively. "BD Exception" signifies when the EGRRCPA exempted a capped amount of reciprocal deposits from being treated as brokered deposits. The grey shaded area denotes the period after SVB's failure through 2023Q3.
Source: FR Y-9C, CRSP.

Table 1: Descriptive Statistics

	N	p25	p50	p75	Mean	s.d.
Total assets ($1,000s, log)						
Network	1,539	12.74	13.48	14.41	13.68	1.32
Non-network	3,217	11.57	12.29	13.09	12.42	1.34
Return on assets (pct.)						
Network	1,539	0.83	1.09	1.37	1.09	0.58
Non-network	3,217	0.64	0.98	1.32	1.02	0.78
Total loans/total assets (pct.)						
Network	1,539	62.14	71.86	79.38	69.93	12.87
Non-network	3,217	45.80	58.80	72.00	57.07	20.38
Total equity/total assets (pct.)						
Network	1,539	7.59	8.89	10.60	9.25	3.30
Non-network	3,217	6.85	8.93	11.52	11.15	11.48
Total securities/total assets (pct.)						
Network	1,539	8.59	14.99	23.59	16.76	10.89
Non-network	3,217	11.96	22.91	34.66	24.35	15.87
Insured deposits/total deposits (pct.)						
Network	1,539	51.49	60.83	69.90	60.04	14.73
Non-network	3,165	53.04	62.93	71.46	61.64	15.46
Number of branches (log)						
Network	1,536	1.39	1.95	2.67	2.02	1.15
Non-network	3,153	0.00	1.10	1.79	1.15	0.99
Deposits per branch ($1,000,000s)						
Network	1,536	60.70	88.14	138.86	135.00	155.25
Non-network	3,153	40.65	61.47	98.10	100.24	148.73

Notes: This table reports summary statistics for network and non-network banks as of 2022Q4. "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 2: 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 exception), 2022Q4 (Pre-SVB), and 2023Q4 (Post-SVB). Headquarter location is obtained from the Call Reports' Panel of Reporters. *Source:* Call Reports.

Table 3: 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	65.7
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 exception), 2022Q4 (Pre-SVB), and 2023Q4 (Post-SVB). Headquarter location is obtained from the Call Reports' Panel of Reporters.
Source: Call Reports.

Table 4: Total Deposit Growth and Pre-SVB Network Presence

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	First Stage	Reduced Form	2SLS	OLS	First Stage	Reduced Form	2SLS	OLS
Network_{2022Q4}	0.0773^{***}	0.0400^{***}			0.0540^{***}	0.0259^{***}		
	(0.0056)	(0.0032)			(0.0061)	(0.0035)		
$\Delta\ln(\text{Ins. Dep})_{2023Q3,2022Q4}$			0.5165^{***}	0.4095^{***}			0.4737^{***}	0.3872^{***}
			(0.0343)	(0.0136)			(0.0524)	(0.0141)
ROA_{2022Q4}					-0.0583^{***}	-0.0260^{**}	-0.0032	-0.0088
					(0.0183)	(0.0102)	(0.0081)	(0.0076)
$\text{Securities/Assets}_{2022Q4}$					-0.0027^{***}	-0.0019^{***}	-0.0007^{***}	-0.0010^{***}
					(0.0002)	(0.0001)	(0.0002)	(0.0001)
$\ln(\text{Assets})_{2022Q4}$					0.0033^{*}	-0.0004	-0.0017^{*}	-0.0009
					(0.0019)	(0.0012)	(0.0010)	(0.0009)
Constant	0.0474^{***}	0.0074^{***}	-0.0170^{***}	-0.0092^{***}	0.0875^{***}	0.0664^{***}	0.0252^{**}	0.0277^{**}
	(0.0027)	(0.0019)	(0.0027)	(0.0012)	(0.0257)	(0.0166)	(0.0119)	(0.0119)
Observations	4,553	4,579	4,553	4,553	4,553	4,579	4,553	4,553
R^2	0.0467	0.0320	0.0319	0.4291	0.1019	0.1028	0.1028	0.4458
KP LM Statistic	181.015				75.483			
CD Wald F Statistic	222.989				93.796			
KP Wald F Statistic	192.690				78.204			

Notes: The table presents the estimated coefficients from the IV strategy. The first stage coefficient, shown in column (1), reflects the causal relation between insured deposit growth (Δ ln(Ins. Dep)) from 2022Q4 to 2023Q4 and bank network status in 2022Q4. The reduced form coefficient, estimated by regressing total deposit growth (Δ ln(Deposits)) from 2022Q4 to 2023Q4 on network status in 2022Q4, is shown in column (2). The 2SLS estimate, found in column (3), shows the causal relation between total deposit growth from 2022Q4 to 2023Q4 and insured deposit growth in the same period. The OLS coefficient in column (4) is estimated from regressing total deposit growth from 2022Q4 to 2023Q4 on insured deposit growth over the same period. Columns (5) through (8) add controls for bank-level characteristics, including bank size, securities holdings, and profitability, as measured in 2022Q4. Heteroskedasticity-robust standard errors are reported in parentheses. Statistical significance levels are indicated by *, **, and ***, representing significance at the 10%, 5%, and 1% levels, respectively.
Source: Call Reports.

Table 5: Number of Insured Accounts and Pre-SVB Network Presence

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	First Stage	Reduced Form	2SLS	OLS	First Stage	Reduced Form	2SLS	OLS
Network_{2022Q4}	0.0773***	0.0413***			0.0540***	0.0158***		
	(0.0056)	(0.0050)			(0.0061)	(0.0057)		
$\Delta\ln(\text{Ins. Dep})_{2023Q3,2022Q4}$			0.5338***	0.4810***			0.2931***	0.4602***
			(0.0572)	(0.0270)			(0.0952)	(0.0276)
ROA_{2022Q4}					-0.0583***	-0.0744***	-0.0573***	-0.0466***
					(0.0183)	(0.0181)	(0.0168)	(0.0138)
$\text{Securities/Assets}_{2022Q4}$					-0.0027***	-0.0016***	-0.0009***	-0.0004***
					(0.0002)	(0.0002)	(0.0003)	(0.0001)
$\ln(\text{Assets})_{2022Q4}$					0.0033*	0.0117***	0.0108***	0.0091***
					(0.0019)	(0.0022)	(0.0022)	(0.0018)
Constant	0.0474***	0.0393***	0.0141***	0.0179***	0.0875***	-0.0470	-0.0726***	-0.0775***
	(0.0027)	(0.0026)	(0.0042)	(0.0018)	(0.0257)	(0.0286)	(0.0239)	(0.0231)
Observations	4,553	4,553	4,553	4,553	4,553	4,553	4,553	4,553
R^2	0.0467	0.0163	0.0163	0.2836	0.1019	0.0595	0.0595	0.2955
KP LM Statistic	181.015				75.483			
CD Wald F Statistic	222.989				93.796			
KP Wald F Statistic	192.690				78.204			

Notes: The table presents the estimated coefficients from the IV strategy. The first stage coefficient, shown in column (1), reflects the causal relation between insured deposit growth (Δ ln(Ins. Dep)) from 2022Q4 to 2023Q4 and bank network status in 2022Q4. The reduced form coefficient, estimated by regressing the change in # of insured accounts (Δ ln(# Accounts)) from 2022Q4 to 2023Q4 on network status in 2022Q4, is shown in column (2). The 2SLS estimate, found in column (3), shows the causal relation between the change in # of insured accounts from 2022Q4 to 2023Q4 and insured deposit growth in the same period. The OLS coefficient in column (4) is estimated from regressing the change in # of insured accounts from 2022Q4 to 2023Q4 on insured deposit growth over the same period. Columns (5) through (8) add controls for bank-level characteristics, including bank size, securities holdings, and profitability, as measured in 2022Q4. Heteroskedasticity-robust standard errors are reported in parentheses. Statistical significance levels are indicated by *, **, and ***, representing significance at the 10%, 5%, and 1% levels, respectively.
Source: Call Reports.

Table 6: 12MCD10K Rate Change and Pre-SVB Network Presence

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	First Stage	Reduced Form	2SLS	OLS	First Stage	Reduced Form	2SLS	OLS
Network_{2022Q4}	0.0773***	-0.1642***			0.0540***	-0.0875**		
	(0.0056)	(0.0396)			(0.0061)	(0.0438)		
$\Delta\ln(\text{Ins. Dep})_{2023Q3,2022Q4}$			-2.2686***	0.4379***			-1.8646*	0.6883***
			(0.5859)	(0.1374)			(0.9872)	(0.1428)
ROA_{2022Q4}					-0.0583***	0.2603**	0.2421**	0.2788**
					(0.0183)	(0.1111)	(0.1228)	(0.1096)
$\text{Securities/Assets}_{2022Q4}$					-0.0027***	0.0039***	-0.0010	0.0064***
					(0.0002)	(0.0015)	(0.0033)	(0.0015)
$\ln(\text{Assets})_{2022Q4}$					0.0033*	-0.0440***	-0.0348*	-0.0642***
					(0.0019)	(0.0159)	(0.0191)	(0.0150)
Constant	0.0474***	1.0943***	1.1943***	1.0064***	0.0875***	1.4717***	1.5692***	1.5927***
	(0.0027)	(0.0236)	(0.0452)	(0.0207)	(0.0257)	(0.2063)	(0.2126)	(0.2005)
Observations	4,553	3,387	3,386	3,386	4,553	3,387	3,386	3,386
R^2	0.0467	0.0050	0.0051	0.0036	0.1019	0.0114	0.0115	0.0184
KP LM Statistic	148.476				55.695			
CD Wald F Statistic	186.134				66.646			
KP Wald F Statistic	157.987				57.284			

Notes: The table presents the estimated coefficients from the IV strategy. The first stage coefficient, shown in column (1), reflects the causal relation between insured deposit growth (Δ ln(Ins. Dep)) from 2022Q4 to 2023Q4 and bank network status in 2022Q4. The reduced form coefficient, estimated by regressing the change in the deposit rate (Δ Rate) from 2022Q4 to 2023Q4 on network status in 2022Q4, is shown in column (2). The 2SLS estimate, found in column (3), shows the causal relation between the change in the deposit rate from 2022Q4 to 2023Q3 and insured deposit growth in the same period. The OLS coefficient in column (4) is estimated from regressing the change in the deposit rate from 2022Q4 to 2023Q4 on insured deposit growth over the same period. Columns (5) through (8) add controls for bank-level characteristics, including bank size, securities holdings, and profitability, as measured in 2022Q4. The deposit rate is the rate offered by banks on the 12-month certificate of deposit with a minimum account size of $10,000. Heteroskedasticity-robust standard errors are reported in parentheses. Statistical significance levels are indicated by *, **, and ***, representing significance at the 10%, 5%, and 1% levels, respectively.
Source: RateWatch, Call Reports.

Table 7: Market-to-Book Ratio and Deposit Growth

Δln(Deposits)$_{2023Q4,2022Q4}$	(1)	(2)
Network$_{2022Q4}$ × Market-to-Book$_{2022Q4}$	-0.0610**	-0.0563**
	(0.0240)	(0.0237)
Market-to-Book$_{2022Q4}$	0.0077	0.0049
	(0.0084)	(0.0101)
Network$_{2022Q4}$	0.0938**	0.0774*
	(0.0441)	(0.0467)
ROA$_{2022Q4}$		4.0641**
		(1.7214)
ln(Assets)$_{2022Q4}$		-0.0066
		(0.0046)
Securities/Assets		-0.2102**
		(0.1061)
Constant	0.0289	0.0504
	(0.0223)	(0.0464)
Observations	205	205
R^2	0.0188	0.0554

Notes: The table presents the estimated coefficients from a cross-sectional regression, examining the relation between the market-to-book ratio of publicly traded bank holding companies and their deposit growth. Column (1) regresses total deposit growth (Δln(Deposits) between 2022Q4 and 2023Q4 on market-to-book ratio as of 2022Q4, network status as of 2022Q4, and an interaction term between the market-to-book ratio and network status. Column (2) add controls for bank-level characteristics, including bank size, securities holdings, and profitability, as measured in 2022Q4. We compute the market-to-book ratio by dividing the market value of a BHC (shares outstanding multiplied by price) with the book value of total assets. Heteroskedasticity-robust standard errors are reported in parentheses. Statistical significance levels are indicated by *, **, and ***, representing significance at the 10%, 5%, and 1% levels, respectively.
Source: CRSP, FR Y-9C, Call Reports.

Table 8: Duration of Securities and Pre-SVB Network Presence

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	First Stage	Reduced Form	2SLS	OLS	First Stage	Reduced Form	2SLS	OLS
Network_{2022Q4}	0.0773***	0.0388***			0.0723***	0.0143		
	(0.0056)	(0.0083)			(0.0062)	(0.0089)		
$\Delta\ln(\text{Ins. Dep})_{2023Q3,2022Q4}$			0.5256***	0.1728***			0.2152*	0.1494***
			(0.1090)	(0.0354)			(0.1256)	(0.0353)
$\ln(\text{Assets})_{2022Q4}$					0.0041**	0.0199***	0.0200***	0.0210***
					(0.0021)	(0.0035)	(0.0037)	(0.0032)
Constant	0.0474***	-0.1503***	-0.1763***	-0.1511***	-0.0043	-0.3987***	-0.4119***	-0.4198***
	(0.0027)	(0.0053)	(0.0093)	(0.0044)	(0.0256)	(0.0444)	(0.0447)	(0.0416)
Observations	4,553	4,502	4,453	4,453	4,553	4,502	4,453	4,453
R^2	0.0467	0.0043	0.0049	0.0109	0.0478	0.0134	0.0153	0.0227
KP LM Statistic	182.272				122.941			
CD Wald F Statistic	228.594				160.649			
KP Wald F Statistic	194.281				131.187			

Notes: The table presents the estimated coefficients from the IV strategy. The first stage coefficient, shown in column (1), reflects the causal relation between insured deposit growth (Δ ln(Ins. Dep)) from 2022Q4 to 2023Q4 and bank network status in 2022Q4. The reduced form coefficient, estimated by regressing the change in duration (Δ ln(Duration)) from 2022Q4 to 2023Q4 on network status in 2022Q4, is shown in column (2). The 2SLS estimate, found in column (3), shows the causal relation between the change in duration risk from 2022Q4 to 2023Q4 and insured deposit growth in the same period. The OLS coefficient in column (4) is estimated from regressing the change in duration risk from 2022Q4 to 2023Q4 on insured deposit growth over the same period. Columns (5) through (8) add bank size as a control for bank-level characteristics, as measured in 2022Q4. Duration is measured by taking a weighted average of the volume of securities in each maturity category, with weights based on the average maturity within each category. Heteroskedasticity-robust standard errors are reported in parentheses. Statistical significance levels are indicated by *, **, and ***, representing significance at the 10%, 5%, and 1% levels, respectively.
Source: Call Reports.

Table 9: Interest Rate Risk and Pre-SVB Network Presence

	Panel A: Extensive Margin - Increase in Maturity Gap							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	First Stage	Reduced Form	2SLS	OLS	First Stage	Reduced Form	2SLS	OLS
Network_{2022Q4}	0.0773***	0.0581***			0.0723***	0.0628***		
	(0.0056)	(0.0153)			(0.0062)	(0.0167)		
$\Delta\ln(\text{Ins. Dep})_{2023Q3,2022Q4}$			0.7355***	0.4503***			0.8569***	0.4526***
			(0.1977)	(0.0410)			(0.2336)	(0.0414)
$\ln(\text{Assets})_{2022Q4}$					0.0041**	-0.0038	-0.0078	-0.0023
					(0.0021)	(0.0055)	(0.0060)	(0.0050)
Constant	0.0474***	0.5767***	0.5431***	0.5639***	-0.0043	0.6245***	0.6346***	0.5930***
	(0.0027)	(0.0089)	(0.0163)	(0.0080)	(0.0256)	(0.0684)	(0.0700)	(0.0649)
Observations	4,553	4,592	4,546	4,546	4,553	4,592	4,546	4,546
R^2	0.0467	0.0029	0.0142	0.0237	0.0478	0.0032	0.0031	0.0238
KP LM Statistic	179.708				127.375			
CD Wald F Statistic	221.336				162.486			
KP Wald F Statistic	191.199				135.955			
	Panel B: Intensive Margin - Change in Maturity Gap							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	First Stage	Reduced Form	2SLS	OLS	First Stage	Reduced Form	2SLS	OLS
Network_{2022Q4}	0.0773***	0.0208			0.0723***	0.0450***		
	(0.0056)	(0.0151)			(0.0062)	(0.0174)		
$\Delta\ln(\text{Ins. Dep})_{2023Q3,2022Q4}$			0.3066	0.6287***			0.6269***	0.6498***
			(0.1921)	(0.0491)			(0.2399)	(0.0501)
$\ln(\text{Assets})_{2022Q4}$					0.0041**	-0.0193***	-0.0200***	-0.0204***
					(0.0021)	(0.0064)	(0.0068)	(0.0054)
Constant	0.0474***	0.0475***	0.0295*	0.0054	-0.0043	0.2858***	0.2621***	0.2650***
	(0.0027)	(0.0093)	(0.0167)	(0.0080)	(0.0256)	(0.0795)	(0.0775)	(0.0695)
Observations	4,553	4,154	4,117	4,117	4,553	4,154	4,117	4,117
R^2	0.0467	0.0004	0.0006	0.0502	0.0478	0.0030	0.0025	0.0536
KP LM Statistic	166.774				110.445			
CD Wald F Statistic	201.148				138.330			
KP Wald F Statistic	177.457				117.402			

Notes: The first stage coefficient in column (1) reflects the causal relation between insured deposit growth (Δ ln(Ins. Dep)) from 2022Q4 to 2023Q4 and bank network status in 2022Q4. The reduced form coefficient in Panel A is estimated by regressing an indicator for an increase in the absolute maturity gap from 2022Q4 to 2023Q4 on network status in 2022Q4. In Panel B, the reduced form coefficient is estimated by regressing the change in the absolute maturity gap (Δ ln(Mat Gap)) from 2022Q4 to 2023Q4 on network status in 2022Q4. The 2SLS estimates in column (3) show the causal relation between the two outcome variables and insured deposit growth in the same period. The OLS coefficients in column (4) are estimated from regressing the outcome variables on insured deposit growth over the same period. Columns (5) through (8) add bank size in 2022Q4 as a control variable. Absolute maturity gap and maturity gap are calculated according to Purnanandam (2007). Heteroskedasticity-robust standard errors are reported in parentheses. Statistical significance levels are indicated by *, **, and ***, representing significance at the 10%, 5%, and 1% levels, respectively.
Source: Call Reports.

Table 10: Asset Growth and Pre-SVB Network Presence

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	First Stage	Reduced Form	2SLS	OLS	First Stage	Reduced Form	2SLS	OLS
Network_{2022Q4}	0.0773***	0.0328***			0.0540***	0.0236***		
	(0.0056)	(0.0028)			(0.0061)	(0.0030)		
$\Delta\text{ln(Ins. Dep)}_{2023Q3,2022Q4}$			0.4338***	0.3321***			0.4246***	0.3169***
			(0.0317)	(0.0120)			(0.0489)	(0.0126)
ROA_{2022Q4}					-0.0583***	-0.0035	0.0086	0.0017
					(0.0183)	(0.0078)	(0.0076)	(0.0071)
$\text{Securities/Assets}_{2022Q4}$					-0.0027***	-0.0014***	-0.0004**	-0.0007***
					(0.0002)	(0.0001)	(0.0002)	(0.0001)
$\text{ln(Assets)}_{2022Q4}$					0.0033*	-0.0011	-0.0019*	-0.0008
					(0.0019)	(0.0011)	(0.0010)	(0.0009)
Constant	0.0474***	0.0332***	0.0120***	0.0194***	0.0875***	0.0821***	0.0427***	0.0458***
	(0.0027)	(0.0017)	(0.0025)	(0.0011)	(0.0257)	(0.0150)	(0.0115)	(0.0114)
Observations	4,553	4,630	4,553	4,553	4,553	4,630	4,553	4,553
R^2	0.0467	0.0276	0.0293	0.3673	0.1019	0.0754	0.0828	0.3784
KP LM Statistic	181.015				75.483			
CD Wald F Statistic	222.989				93.796			
KP Wald F Statistic	192.690				78.204			

Notes: The table presents the estimated coefficients from the IV strategy. The first stage coefficient, shown in column (1), reflects the causal relation between insured deposit growth (Δ ln(Ins. Dep)) from 2022Q4 to 2023Q4 and bank network status in 2022Q4. The reduced form coefficient, estimated by regressing asset growth (Δ ln(Assets)) from 2022Q4 to 2023Q4 on network status in 2022Q4, is shown in column (2). The 2SLS estimate, found in column (3), shows the causal relation between asset growth from 2022Q4 to 2023Q4 and insured deposit growth in the same period. The OLS coefficient in column (4) is estimated from regressing asset growth from 2022Q4 to 2023Q4 on insured deposit growth over the same period. Columns (5) through (8) add bank size as a control for bank-level characteristics, as measured in 2022Q4. Duration is measured by taking a weighted average of the volume of securities in each maturity category, with weights based on the average maturity within each category. Heteroskedasticity-robust standard errors are reported in parentheses. Statistical significance levels are indicated by *, **, and ***, representing significance at the 10%, 5%, and 1% levels, respectively.
Source: Call Reports.

Table 11: Baseline Results Excluding Large Banks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Δ ln(Ins. Dep)	Δ ln(Total Dep.)	Δ ln(# Acct $< 250K$)	Δ12MCD10K	Δ ln(Assets)	Δ ln(Maturity)	$\mathbb{1}_{\text{Increase in Mat Gap}}$	Δ ln(Mat Gap)
Network_{2022Q4}	0.0538***							
	(0.0062)							
$\Delta\text{ln(Ins. Dep)}_{2023Q3,2022Q4}$		0.4794***	0.3053***	-1.8452*	0.4562***	0.2202*	0.9517***	0.6825***
		(0.0537)	(0.0966)	(0.9964)	(0.0374)	(0.1287)	(0.2390)	(0.2403)
ROA_{2022Q4}	-0.0590***	-0.0027	-0.0575***	0.2491**				
	(0.0185)	(0.0082)	(0.0168)	(0.1237)				
$\text{Securities/Assets}_{2022Q4}$	-0.0027***	-0.0007***	-0.0008**	-0.0007				
	(0.0002)	(0.0002)	(0.0003)	(0.0033)				
$\text{ln(Assets)}_{2022Q4}$	0.0035*	-0.0021*	0.0106***	-0.0342*	-0.0015	0.0197***	-0.0113*	-0.0226***
	(0.0020)	(0.0011)	(0.0023)	(0.0198)	(0.0010)	(0.0040)	(0.0063)	(0.0068)
Constant	0.0849***	0.0282**	-0.0718***	1.5525***	0.0292**	-0.4083***	0.6714***	0.2904***
	(0.0269)	(0.0122)	(0.0248)	(0.2195)	(0.0118)	(0.0475)	(0.0735)	(0.0769)
Observations	4,520	4,520	4,520	3,363	4,520	4,420	4,513	4,110
R^2	0.1014	0.1042	0.0589	0.0114	0.0293	0.0143	0.0036	0.0030
KP LM Statistic		72.648	72.648	55.119	124.596	117.963	122.674	108.155
CD Wald F Statistic		90.750	90.750	65.543	159.962	154.722	157.127	135.644
KP Wald F Statistic		75.333	75.333	56.716	133.050	125.765	130.868	114.786

Notes: The table presents the estimated first stage and 2SLS coefficients from applying our IV strategy on a sample of midsize and small banks. We exclude banks with assets greater than $100 billion. The first stage coefficient, shown in column (1), reflects the causal relation between insured deposit growth (Δ ln(Ins. Dep)) from 2022Q4 to 2023Q4 and bank network status in 2022Q4. The 2SLS estimates, found in columns (2) through (8), report the causal relation between total deposit growth, change in number of insured accounts, deposit rate change, change in duration risk, indicator for increase in absolute maturity gap, change in maturity gap on insured deposit growth between 2022Q4 and 2023Q4, respectively. Columns (2) through (4) include controls for bank size, securities holdings, and profitability. Columns (5) through (8) include controls for bank size. The deposit rate is the rate offered by banks on the 12-month certificate of deposit with a minimum account size of $10,000. Duration is measured by taking a weighted average of the volume of securities in each maturity category, with weights based on the average maturity within each category. Absolute maturity gap and maturity gap are calculated according to Purnanandam (2007). Heteroskedasticity-robust standard errors are reported in parentheses. Statistical significance levels are indicated by *, **, and ***, representing significance at the 10%, 5%, and 1% levels, respectively.
Source: RateWatch, Call Reports.

Table 12: Baseline Results - Matched Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Δ ln(Ins. Dep)	Δ ln(Total Dep.)	Δ ln(# Acct $< 250K$)	Δ12MCD10K	Δ ln(Assets)	Δ ln(Maturity)	$\mathbb{1}_{\text{Increase in Mat Gap}}$	Δ ln(Mat Gap)
Network_{2022Q4}	0.0475***							
	(0.0075)							
$\Delta\text{ln(Ins. Dep)}_{2023Q3,2022Q4}$		0.4313***	0.3150**	-3.1598**	0.4042***	0.1895	1.0916**	0.6851*
		(0.0730)	(0.1335)	(1.4926)	(0.0626)	(0.2418)	(0.4318)	(0.4134)
ROA_{2022Q4}	-0.0301	-0.0098	-0.0543**	0.1730				
	(0.0270)	(0.0098)	(0.0233)	(0.1983)				
$\text{Securities/Assets}_{2022Q4}$	-0.0036***	-0.0009***	-0.0008	-0.0074				
	(0.0003)	(0.0003)	(0.0006)	(0.0062)				
$\text{ln(Assets)}_{2022Q4}$	0.0006	-0.0016	0.0102***	-0.0467*	-0.0026**	0.0174***	-0.0011	-0.0089
	(0.0027)	(0.0013)	(0.0027)	(0.0243)	(0.0012)	(0.0044)	(0.0076)	(0.0076)
Constant	0.1391***	0.0339*	-0.0684*	2.0179***	0.0510***	-0.3734***	0.5137***	0.1026
	(0.0375)	(0.0197)	(0.0378)	(0.3652)	(0.0161)	(0.0635)	(0.1032)	(0.0979)
Observations	2,361	2,361	2,361	1,815	2,361	2,311	2,359	2,128
R^2	0.0697	0.0869	0.0355	0.0116	0.0124	0.0090	0.0030	0.0015
KP LM Statistic		39.316	39.316	27.714	42.652	38.246	41.291	35.254
CD Wald F Statistic		38.583	38.583	26.440	42.640	38.167	41.121	35.817
KP Wald F Statistic		40.159	40.159	28.243	43.711	39.125	42.276	36.095

Notes: The table presents the estimated first stage and 2SLS coefficients from applying our IV strategy on a matched sample of network and non-network banks. For each bank in the network as of 2022Q4, we find a comparable non-network bank with similar size (measured as log(total assets)) and the securities to total assets ratio. The single nearest-neighbor matching method with replacement and common support is used to produce the matched sample. The first stage coefficient, shown in column (1), reflects the causal relation between insured deposit growth (Δ ln(Ins. Dep)) from 2022Q4 to 2023Q4 and bank network status in 2022Q4. The 2SLS estimates, found in columns (2) through (8), report the causal relation between total deposit growth, change in number of insured accounts, deposit rate change, change in duration risk, indicator for increase in absolute maturity gap, change in maturity gap on insured deposit growth between 2022Q4 and 2023Q4, respectively. Columns (2) through (4) include controls for bank size, securities holdings, and profitability. Columns (5) through (8) include controls for bank size. The deposit rate is the rate offered by banks on the 12-month certificate of deposit with a minimum account size of $10,000. Duration is measured by taking a weighted average of the volume of securities in each maturity category, with weights based on the average maturity within each category. Absolute maturity gap and maturity gap are calculated according to Purnanandam (2007). Heteroskedasticity-robust standard errors are reported in parentheses. Statistical significance levels are indicated by *, **, and ***, representing significance at the 10%, 5%, and 1% levels, respectively.
Source: RateWatch, Call Reports.