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DEPOSIT INSURANCE, DEPOSIT COMPETITION, AND BANK INSTABILITY

Matthew S. Jaremski
Steven Sprick Schuster

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ABSTRACT

The lack of full deposit insurance coverage might lead to additional financial instability during crises if uninsured depositors move funds to more secure institutions. Because the broad coverage of modern systems makes this dynamic hard to test, we study the role that the U.S. Postal Savings System, which provided insured accounts at some post offices, played in the Great Depression. Postal savings was associated with increased depositor withdrawals at banks in the same town. Using an IV that identifies exogenous variation in postal saving, we find that banks were more likely to close when a nearby post office accepted deposits.

Matthew S. Jaremski
Utah State University
Department of Economics
and NBER
matthew.jaremski@usu.edu

Steven Sprick Schuster
Middle Tennessee State University
stevenschuster@gmail.com

> While banks were failing all over the country and a veritable avalanche of funds came out of other banks, it was the Postal Savings System that salvaged much of the money withdrawn by the frightened and the timid.
>
> -Rep. Emanuel Celler of New York (*Congressional Record*, Dec. 9, 1931, p. 235)

Deposit insurance is a common solution for preventing runs, but the lack of universal coverage can decrease financial stability during crises as uninsured depositors flee to safety. For example, thousands of uninsured depositors at regional banks moved their funds to other banks following the collapse of Silicon Valley Bank in March 2023 (e.g., Drechsler et al. 2023; Chang et al. 2023; Caglio et al. 2024; Kim et al. 2024; Jiang et al. 2024).[1] But can the lack of universal deposit insurance lead to more withdrawals than if there was no insurance at all? Answering this question in modern data is hard because deposit insurance often covers all banks and uninsured depositors are sensitive to the risks taken by each insured banks. Therefore, we study a historical period that allows a within-country comparison of uninsured banks whose depositors have an insured option with uninsured banks whose depositors do not have one in the same time period.

Before the Federal Deposit Insurance Corporation (FDIC) was created in 1933, the only federally-insured deposit accounts available to American households were through the U.S. Postal Savings System (1911-1967), which was offered at some (but not all) post offices throughout the nation. Postal savings deposits soared during the Great Depression and contemporary accounts indicate that depositors moved their funds from commercial banks to post offices. We find that the availability of the federally-insured deposit option is associated with more commercial bank deposit losses and instability than otherwise identical locations without any insurance but only before the establishment of the FDIC.

Deposit insurance spread throughout the world in the latter half of the 20th century as a result of external and internal political pressures favoring its adoption (Demirgüç-Kunt et al.

[1] Martin et al. (2024) use daily account-level data to show that this phenomenon occurs more broadly, but that banks offset at least some of the withdrawals by seeking to bring in more insured depositors.

2008). Despite support from organizations such as the International Monetary Fund, the European Union, and the World Bank, a large literature (e.g., Martinez-Peria and Schmukler 2001; Demirgüç-Kunt and Detragiache 2002; Demirgüç-Kunt and Huizinga 2004; Cull et al. 2005; Barth et al. 2006; Pennacchi 2006; Beck and Laeven 2008; Laeven and Valencia 2013; Calomiris and Jaremski 2016, 2019; Calomiris and Chen 2023) has shown that insured banks expand their risk and increase the probability of a financial crisis. However, few if any have empirically studied whether the lack of universal coverage encourages customers to move uninsured deposits during a crisis and thus decreases bank stability. This aspect is hard to test because most deposit insurance systems span all banks and runs due to the risk-taking behavior of insured banks cannot be separated from those due to the competition for uninsured funds.

The U.S. Postal Savings System has the unique potential to test whether limited deposit insurance can lead to greater bank runs and instability than would have occurred without any insurance. Post offices operated beside commercial banks in towns throughout the country, but not every post office accepted deposits. Due to restrictions on branching, we can compare bank outcomes in very similar markets (e.g., same bank regulations, macroeconomic conditions, and legal and monetary systems) that vary due to the availability of deposit insurance. Moreover, because post offices were narrow banks that did not make loans (e.g., Pennacchi 2012) and attracted few deposits before 1929 by construction, the existence of postal savings did not lead to additional risk-taking or moral hazard. However, as uncertainty about bank health rose during the 1930s, concerned depositors withdrew money from their banks to keep safe at home or in commonly-available safe assets. A federal insurance option in their town may have motivated depositors to withdraw funds that would otherwise have remained in commercial banks in order to put them in insured accounts.

We start our analysis by examining the deposit competition between postal savings and commercial banks. Collecting annual town-level deposit data for the entire country from 1925 through 1935, we compare the changes in deposits at commercial banks and postal savings. Even controlling for town and region-by-year fixed effects, we find a significant negative relationship between the two types of deposits in the same year and town. Supporting contemporary accounts, it is clear that the institutions were directly competing as depositors seem to have moved funds from their bank to the postal system during the Depression.

To examine the role that postal savings competition played on bank stability, we collect the balance sheets of over 16,000 commercial banks just before the start of the Great Depression. We avoid the endogenous response to the Depression by examining whether banks in places with postal savings before 1929 were more likely to close between 1929 and 1935 than banks in other areas. Any measured effect of postal savings availability on bank closures is on top of closures caused by the common, nationwide shock experienced during the Depression.

We find banks that operated near a post office that accepted deposits before the Depression were more likely to close than those that did not, even when controlling for bank fundamentals and location characteristics. However, once commercial banks were insured by the FDIC, the effect of postal savings is eliminated, suggesting the results are driven by depositors seeking insured deposits rather than an unobserved location-specific effect. Congress tried to prevent this competition by redepositing postal savings into commercial banks, but relatively few banks outside financial centers received the funds and the bond security requirements prevented them from using the postal funds as liquid reserves. As such, a dollar of deposits contributed more to bank stability than a dollar of postal savings redeposits. The results are thus not sensitive to controlling for banks that were likely receiving redeposits.

Because the availability of postal deposits could be endogenous, we exploit a structural change in the 1910s to estimate a causal effect on bank closures within an Instrumental Variables framework (IV). The vast majority of post offices initially accepted deposits, but the Post Office stopped thousands of offices from accepting them during World War I (WWI). We find that post offices were significantly less likely to stop taking deposits in 1915-1916 if they had any usage, no matter how small that usage was. We thus compare commercial banks during the Great Depression in locations that had a postal savings bank with 0 depositors in the mid-1910s with those in locations that had a postal savings bank with exactly 1 depositor in the mid-1910s. Those locations, and the banks operating in them, were very similar in terms of location and bank characteristics in 1929 and trends over the 1920s. The IV analysis confirms that commercial banks that operated in the same town as postal savings were more likely to close by 1935, providing larger coefficient estimates than the OLS.

Similar to the town-level deposits analysis, the balance sheet data point to differential depositor withdrawals as the mechanism for the bank closures. We find that banks in postal savings areas needed more liquidity to survive than banks in other areas. Alternatively, banks with high leverage and loans were largely unaffected by the presence of postal savings. The result confirms our narrative and adds weight to our identification strategy. If post offices that accepted deposits were endogenously attracted to high ex ante risk areas (or if banks in postal saving areas endogenously adopted risky portfolios), then all banks in postal savings areas should have been more likely to close during the Depression. The finding that only low-liquidity banks were systematically more likely to close in postal savings areas further indicates that there is not a location-specific unobserved characteristic driving both bank closures and postal savings.

The limited availability of deposit insurance thus acted as a catalyst to encourage a greater flight-to-quality response in the Depression. Few depositors used postal savings before 1929, but they quickly moved funds into the post office thereafter. Depositors throughout the country had other safe options, but the presence of insured deposits led to additional withdrawals. The preemptive shift of funds may have protected individual depositors from taking losses at banks, but led to the closures of those banks that did not start the Depression with sufficient liquidity buffers. Some of the banks were merged into others, but the destruction of financial capital and loss of lending relationships caused a decline in lending and potentially deepened the Depression (Bernanke 1983).

Our analysis complements the literature on deposit insurance. Studies have shown that deposit insurance increases bank risk through moral hazard. However, the postal savings context shows that deposit insurance can lead to bank instability even without moral hazard. Specifically, given the outside option of an insured account instead of a mattress, more depositors withdrew funds from banks than did in other areas. Other studies have examined early US state deposit insurance which only covered some banks, but they do not study a credible insurance system when all banks were subject to runs. For instance, Wheelock and Wilson (1995) show that the failure of Kansas' deposit insurance system in the 1920s was a result of the moral hazard of insured banks rather than a general crisis that subjected all depositors to risk. Postal savings during the Great Depression is thus one of the few settings that allow for the isolation of competition between insured and uninsured institutions from the effect of moral hazard.

The results shed light on how competition for uninsured depositors can lead to bank instability (e.g., Hellmann et al. 2000; Boyd and DeNicolo 2005; Goldstein and Pauzner 2005; Egan et al. 2018). For instance, studies highlight how specific U.S. financial crises were created

by less regulated and more risky institutions attracting funds through promises of high returns (Moen and Tallman 1992; Gertler and Gilchrist 2018). We show that competition caused by low-return, riskless deposit opportunities can also worsen financial crises when they do occur. As government guaranteed investment options begin to mimic bank deposits (e.g., central bank digital currency), banks with only partial insurance might be exposed to greater withdrawal during crises. Indeed, during the March 2023, many depositors supposedly fled small regional banks for large systemically important banks that were more likely to receive government support.

Our research informs the debate regarding the re-establishment of postal savings. Since 2018, there have been numerous legislative proposals to bring postal savings back. Most recently in 2022, when Sen. Gillibrand also released a "Postal Banking" report arguing that it could be used by 25 million American households. The results show that lawmakers need to take into consideration the effect that postal banking may have on private markets. The government guarantee of postal banking attracted funds from commercial banks despite the safeguards put in to avoid such competition. In fact, the results would suggest that the same type of competition could occur with any government guaranteed asset.

We also extend the Postal Savings System literature. Following O'Hara and Easley (1979), Fleitas et al. (2023) show that some postal savings increases during the Great Depression were associated with a slowdown in new shares at local B&Ls. However, because B&L shares were not demandable, the results are not driven by depositor withdrawals, and few B&Ls closed during their period of study. Our results show that postal savings led to more commercial bank closures as a result of depositors withdrawing their funds. The study thus provides empirical

evidence to the narrative analysis in Sprick Schuster et al. (2020) who argue the rise of postal savings during the Great Depression was a flight to quality by existing bank depositors.

1. Historical Background

Created in June 1911, the U.S. Postal Savings System offered individuals the ability to start a savings account at thousands of local post offices. Postal accounts paid depositors a fixed 2 percent interest rate and were initially capped at $500 per person. Most postal deposits were to be re-deposited in commercial banks in exchange for roughly an equal amount of bonds as collateral and 2.25% interest payments (and 2.5% after 1934). The deposits were a liability of the US government, meaning if a commercial bank holding postal deposits closed, postal customers' accounts would be unaffected.

U.S. officials advocating for establishing postal savings pointed to the security it offered savers. In 1878, Rep. Thomas J. Tipton (R-IL) articulated: "(P)eople all over the country will be afforded an opportunity to invest their savings with assurance that the principal will be returned with a small interest...The failure of savings banks and consequent loss, especially to the poorer class, makes the demand greater than ever before" (Congressional Record, 3/11/1878, Pg. 1680). The Panic of 1907 then helped break the political logjam and the bill passed in 1910.

The nation's banking sector was the main opponent of postal savings legislation. Bankers feared the Post Office would siphon money out of communities (Roberts 1907). The American Banking Association (ABA) argued that postal savings would compete with existing banks. They even distributed a nation-wide letter to bankers that stated:

> The Postmaster General naively says: 'These postal savings banks will not compete in any way with our present banks.' He thinks he is stating a fact, doubtless, but as well might a highwayman, emptying a repeating Colt at you,

> say: 'I am shooting these bullets at you, but I do not intend to hurt you in any way.' (quoted in Kemmerer 1917, Pg 14-15).

The system's key characteristics were an attempt to mitigate bankers' fears and gather their support. For instance, the system's 2% fixed rate of interest was significantly lower than the over 3.25% interest rate that commercial banks paid on average during the period. The low limit on postal saving accounts also discouraged many households from starting an account. Postal accounts were thus slated towards the small depositors that commercial banks would not normally pursue (Sprick Schuster et al. 2020). The ABA and other banking institutions remained cautious of postal saving but found it a much better option than the federal deposit insurance that politicians proposed as an alternative (Schewe 1971, pg. 60).

The Post Office allowed deposits to be accepted at almost 13,000 post offices by 1913. However, most initial postal savings depositors held only a small amount in their account. In 1916, $0.086 billion was deposited at post offices compared to $22.6 billion in commercial banks (Board of Governors 1959). To make the system more attractive, the Post Office raised the maximum balance to $2,500 in 1917. This was a sizable amount of money per person (representing $78,327 in 2023 dollars), and was also the initial limit established on insured commercial bank deposits by the FDIC in 1933.

While postal savings continued to see limited aggregate use in the 1920s, there were spikes in usage linked to local banking panics. Contemporary accounts (e.g., *The St. Louis Star and Times* 1924) highlighted how postal saving growth in some areas was due to a desire for security following their bank's troubles. For example, postal deposits in Florida grew by 600% during the state's real estate bubble collapse in 1925-6 (Calomiris and Jaremski 2023), and the failure of the few state deposit insurance systems in the 1920s led to large increases in local postal deposits (Davison and Ramirez 2017).

The Great Depression supercharged the demand for accounts at post offices (see Appendix Figure A1). Between 1928 and 1934, postal deposits increased by 687% in nominal dollars from $0.15 to $1.20 billion, while deposits in the commercial banks declined from $46.58 to $36.81 billion (Board of Governors 1959). Almost 70% of the postal saving growth came from an increase in the number of depositors rather than an increase in the size of the existing accounts. The new depositors came from across the income and demographic spectrum, and were different from the few who used postal savings before 1929. Growth in postal deposits then plateaued once the FDIC became active.

The ability for depositors to quickly move their funds to a local post office presented a substantial risk for local banks. Even at the system's beginning, Kemmerer (1917, Pg. 80) considered the role that postal savings could play during a crisis:

> Opponents of postal savings said that the difference between the interest paid by the postal savings bank and that paid by the other banks would be a matter of slight consequence in times of panic, safety of deposits being the great desideratum; and that the accessibility and safety of postal savings banks would encourage excessive withdrawals from other banks.

Observers during the Great Depression highlighted the competition between postal savings banks and commercial banks. For example, during a 1932 Milwaukee banking crisis, the local post office had to open additional teller windows to meet depositor demand and over $100,000 was deposited on July 19 alone ("Postal Savings Mount" *Milwaukee Journal* July 20, 1932). The ABA and commercial banks began to lobby against postal savings in the 1930s. One New York banker in 1933 expressed, "If the alarming rate of increase in the Postal Savings System continues, it will ultimately result in the destruction of our entire banking system" (cited in Shaw 2018). It is clear that contemporary observers believed that commercial bank deposits were flowing into postal savings banks.

While post offices redeposited some funds back into commercial banks, relatively few banks received any of those redeposits. In 1929, 83.1% of postal deposits were redeposited but only 3,879 of the over 25,000 commercial banks received any funds. The lack of redepositories was due to the stringent rules placed on their selection. Not only were banks primarily required to be Federal Reserve members, but they had to fully back redeposits with bonds and pay a fixed 2.25% interest rate. The redeposits were thus clustered in large banks in financial centers rather than being redeposited back into the local banks throughout the country where funds came from.

The rest of this paper uses nation-wide data to test whether the contemporary anecdotes were correct. We start by examining whether postal savings and commercial banks competed for deposits by comparing deposit flows of nearby institutions. Depositors throughout the country shifted their funds from banks into cash and other safe assets, but postal savings availability may have encouraged additional flight-to-quality than in other areas. Next, we test whether the availability of postal savings led to a higher probability of a commercial bank closing. Because postal savings had no regulatory power over banks and did not make loans, we thus are examining whether depositors withdrew enough funds from banks to force them to close in locations with postal savings than banks in other locations.

2. Data

Town-level postal savings data are drawn from *Annual Reports on the Operation of the Postal Savings System*. Collected by Sprick Shuster et al. (2020), they include the annual value of deposits and number of depositors at each post office. In some years, the post office only reported the individual post offices that had at least 1 depositor. This means that post offices that accepted postal savings but had no depositors at the end of fiscal year were not included. We

impute whether a post office had postal savings for these few years using whether it had reported having a depository in the years immediately surrounding it. This approach yields a total number of postal depositories very close to those reported.

To examine the relationship between deposits at postal savings banks and those at deposits in the same town, we collect town-level data on commercial bank deposits each year from the *Rand McNally Bankers' Directory.* Staff of the Federal Reserve Board's Division of Bank Operations frequently consulted *Rand McNally* for bank information. We use the July edition each year to match the timing of the postal savings deposit data. The data span all towns and years from 1925 through 1935.

Bank-level balance sheet data are needed to analyze whether the availability of postal savings affected the stability of commercial banks. We collect individual balance sheet information in 1928 for national banks from the *Annual Report of the Comptroller of the Currency* and for state-chartered banks from state banking reports.[2] Several states did not report individual bank balance sheets during the period, and must be excluded from the closure analysis. Nevertheless, the data span the entire country and include nearly 65% of banks operating during 1928. We determine whether each state bank was a Fed member using the *Annual Report of the Federal Reserve Board*.

We use the list of "Discontinued Bank Titles" in the January 1935 edition of *Rand McNally Bankers' Directory* to identify bank closures. The list describes every change in a bank's title and the year of occurrence from late 1929 through early 1935. This allows us to avoid conflating terminal bank closures with temporary closures, location changes, or name changes, and provides a consistent source of information for all banks. The closure variable

[2] We use observations for June 1929 for Nebraska as the state did not publish any information in 1928. The results are not affected if we drop out these banks.

includes any bank that was closed, liquidated, acquired, assumed, absorbed, consolidated, merged, or was succeeded or replaced by another bank. For name or location changes, we link closures under the new name or location back to the original bank. Any bank not on the list is denoted as remaining open through early 1935.

Figure 1 shows the location of postal savings depositories and commercial banks in 1928. The coverage of both types of institutions matches the distribution of population (i.e., concentrated in the Northeast and Midwest and diffuse in the South and West). While all towns with banks had a post office, there is considerable variation in which ones accepted postal savings. About 51.4% of commercial banks are located in a town that lacked postal savings in 1928. Our analysis should be representative of the nation and have sufficient treatment and control groups to identify the effect of postal savings on bank stability. Finally, we add county-level information on demographics and economic characteristics from the U.S. Census Bureau (Haines 2018) and tax return data from Fishback et al. (2011).

3. Town-Level Deposit Competition

There is no question that post offices attracted substantial deposits during the Great Depression, but did the existence of postal savings as a federally insured option lead to more withdrawals from commercial banks and potentially more bank closures? Before testing whether postal savings availability led to financial instability, we examine whether the system competed with commercial banks for depositors as suggested by contemporary accounts. During this period, branching was largely prohibited and very few depositors had access to commercial banks in other towns. We thus can compare the deposits in a town's post office with commercial bank activity in the same town. Panel A of Figure 2 shows postal savings rose across all

locations during the Depression, but rose by significantly more in locations with more banks. Moreover, Panel B shows that postal savings grew fastest in locations with bank instability, with differential growth starting in the year of a bank's closure and continuing the year after.

Given that individuals held little savings outside of banks, the pattern suggests that deposits were moving from commercial banks to nearby post offices. We econometrically test for this competition by examining whether postal savings deposits were rising specifically in those towns where commercial bank deposits were falling. If growth in postal deposits was caused by increased local financial demand instead, then we would expect commercial bank deposits to also rise. The town-level panel from 1925 through 1935 allows us to match the exact timing of changes in deposits between the institutions and include a variety of controls. Most importantly, we can control for town-fixed effects to capture any location-specific characteristics that might have led to faster or slower deposit growth as well as region-by-year fixed effects to capture regional shocks that could be affecting depositors over time. Including all locations with a postal savings bank before 1935, the model is:

$$CBDeposits_{i,t} = a + \beta_1 LnPostalDeposits_{i,t} + u_i + t_t + t_t * Region_i + e_{i,t} \quad (1)$$

where $CBDeposits_{i,t}$ is the logarithm of the total commercial bank deposits in town *i* in year *t*, $PostalDeposits_{i,t}$ is the logarithm of the total postal savings deposits in town *i* in year *t*, u_i is a vector of town fixed effects, t_t is a vector of year fixed effects, $Region_i$ is a vector of 9 regional indicators, and $e_{i,t}$ is the robust standard error clustered by state.

The results in Table 1 show a negative relationship between the logarithms of postal deposits and commercial bank deposits. In column 1, a 1% increase in postal savings deposits is

associated with a 0.084% decrease in commercial bank deposits.[3] Given that postal savings increased by more than 500% in the first years of the Depression, the small marginal effect still represents meaningful changes to commercial banks. Next, we examine whether the competition between the two types of institutions changed after the passage of the FDIC in mid-1933. We do this by interacting the postal savings variable with an indicator for years after 1932. Column 2 of Table 1 shows that the negative effect of postal savings deposits is severely weakened after 1932. Finally, we show the results are similar when dropping out the few locations that did not have a bank before 1929 to avoid any towns that gained a bank late. The data thus indicate that postal savings and commercial banks competed for deposits particularly before the FDIC.

While the log-log specification in equation (1) can capture relationships that play out over several years, we can also examine a much narrower window of time. If contemporary accounts of depositors taking money out of commercial banks and placing it in postal savings are correct, then we should find a significant negative relationship between the institutions in the exact same year. Columns 4-6 thus show the results from equation (1) when using the logarithm change in postal savings deposits as the primary explanatory variable of interest and the logarithm change in commercial bank deposits as the outcome variable. Despite the narrow time window, we find that increases in postal savings are associated with decreases in commercial bank deposits in the same year and place. In column 4, a 1% increase in postal savings deposits is associated with a 0.046% decrease in commercial bank deposits in the same town-year. The weakening of the effect after the establishment of the FDIC is smaller than in the log-log specification, but overall, the results are similar to those in the first three columns.

[3] While unreported, postal savings seems to have gained $1 for every $7.5 in deposits lost by commercial banks in the same town when estimating equation (1) with dollar values instead of logarithms. This seems reasonable given that depositors had the choice of keeping their cash at home or investing in other safe assets.

4. Effect of Postal Savings on Bank Closures

The town-level deposits data indicate that commercial banks and post offices competed for depositors during the Depression. However, the important question is whether this competition was large enough to lead to bank closures. To test the effect of the local availability of postal savings on commercial bank closures, we start with an analysis of all locations where we have balance sheet information. Next, we narrow the sample to make use of an instrumental variable approach that isolates exogenous variation in postal savings. Finally, we provide additional evidence that closures were driven by depositors moving their funds out of commercial banks and into postal savings.

The model controls for many types of characteristics that could have affected bank stability and postal savings status. First, we examine each bank's balance sheet position[4]: the logarithm of total assets, loans to assets, paid-in capital, surplus, and undivided profits to assets (i.e., capital to assets), surplus and undivided profits to paid-in capital, surplus, and undivided profits (i.e., profit to capital), and cash and due from banks to total deposits (i.e., cash to deposits). Because banks thus served the community immediately around their location and there was relatively little diversity in the type of business they conducted, these measures have been found to be correlated with the probability of bank closure during the Panic of 1907 (Jaremski and Wheelock 2023), the 1920s agricultural depression (Jaremski and Wheelock 2020), and Great Depression (White 1984, Richardson and Troost 2009, Calomiris et al. 2022). They are also similar to measures regulators used to determine bank health during modern stress tests. We further include indicators for whether the bank was a national bank or a Fed member state bank (with state-chartered, non-Fed member banks as the excluded group) to capture their higher regulation and supervision.

[4] During the period, information on income statements and loan loss provisions were not publicly available.

Second, we include county-level demographic and economic control variables in 1929 to account for local variation that could influence bank stability and induce the local post office to accept deposits. These variables include: the logarithm of population, fraction living in an urban location of 2,500 or more people, the fraction of the adult population that is illiterate, the fraction of the population that is non-white, the logarithm of the number of farms per capita and the logarithm of the number of manufacturing establishments per capita, the fraction of population that filed a tax return in 1929 (a proxy for high income households), and indicators for whether the bank was located in a city designated as a Central Reserve City or Reserve City.[5] To capture differential growth before the Great Depression, we also include the changes in the population, urbanization, farming, and manufacturing variables between 1919 and 1929 and the change in the fraction filing taxes between 1921 (the first year the information is provided) and 1929.

Third, we include state-fixed effects to capture both regional differences in economic activity as well as differential bank regulations. For instance, Mitchener and Jaremski (2015) show wide differences in the types of regulation and supervision that each state installed.

4.1 Nation-Wide Analysis

We start our analysis of commercial bank closures from 1929 to 1935 by utilizing the full sample of commercial banks that had balance sheet data for 1928. Our initial measure of postal savings is whether a town's post office accepted deposits in 1928. This intent-to-treat approach misses any postal savings banks created during the Depression, but is intended to avoid any endogenous reaction to local bank troubles. Most postal saving depositories in 1928 were

[5] There are a few outliers in the data likely caused by typos in the original documents. Banks for which cash and due from banks to total deposits is greater than 1 or loans to assets less than 0.1 are dropped as well as counties that report more than 100% of the population filing a tax return. Values of cash and due from banks to total deposits less than 0.01 are windsorized to 0.01. The results are not affected if we keep these banks in or choose other cutoffs.

established in the early 1910s, and given their very little use, banks largely ignored them before the Depression. For example, 2,097 of the 5,855 postal savings banks in 1928 had less than $100 worth of deposits. The availability of postal savings in a location rather than its deposits avoids capturing explicit preferences for postal savings over commercial banks. Even if no one used postal savings before 1929, the mere existence of an office during the 1930s would have given depositors the ability to quickly shift deposits away from commercial banks. The measure thus captures the potential for withdrawals and treats all postal savings locations the same regardless of whether they had $1 on deposit or $1 million.

We report the summary statistics in the top panel of Figure 6. The data show that postal savings was more likely to be available in populated areas which had more banks and fewer farms. If anything, these characteristics would imply fewer closures as banks in larger cities were better capitalized and had higher reserve requirements making them less likely to close. Nevertheless, we directly control for these factors in the regressions, and show the results are not sensitive to utilizing time series variation in postal savings and controlling for county-fixed effects. Moreover, we emphasize the IV analysis in Section 4.2 that focuses on exogeneous variation in postal savings.

We use OLS to estimate the probability that a bank present in 1928 closed by 1935:

$$Closure_i = a + \beta_1 Postal_{1928,i} + \beta_2 BalSheet_i + \beta_3 X_i + \beta_4 State_i + e_i \quad (2)$$

where $Closure_i$ is an indicator for whether bank *i* had closed between 1929 and 1935, $Postal_{1928,i}$ is an indicator for whether postal savings was available in the location in 1928, $BalSheet_i$ is a vector of bank balance sheet items in 1928 discussed above and indicators for whether the bank is a national bank or a Fed member. X_i is a vector of the Census characteristics discussed above. $State_i$ is a vector of state indicator variables, and e_i is Huber-White robust

standard errors clustered at the state level. We estimate a linear probability model to be consistent with the IV regressions, but logit and probit models provide similar results.

Column 1 of Table 2 provides the estimated coefficients of equation (2) for the full sample of banks. While all locations had a post office, having one that accepted deposits in 1928 was positively correlated with a bank's probability of closure over the Great Depression. Specifically, a bank that was in the same town as postal savings was about 3.13 percentage points more likely to close than one that was not. This effect is on top of closures caused by the general tendency of depositors to remove funds from banks throughout the nation. Therefore, the higher probability of closure associated with postal savings suggests that the availability of a local, federally-insured deposit option caused more depositor withdrawals than in locations without that alternative. Because of the relative consistency of postal savings between 1916 and 1928, earlier years of postal savings availability also positively predict closures in the Great Depression (see Figure A2).

We next test whether the results are sensitive to different specifications in columns 2 and 3 of Table 2.[6] First, we examine whether the effect of postal savings is driven by local closure rates. If postal savings was attracted to high bank risk locations, then the measured effect would be negatively biased. We therefore control for the fraction of all other commercial banks in the county that closed during the period to capture differential panic intensity across the country. While surrounding closures are significantly correlated with the observed bank's closure, the coefficient on the availability of postal savings remains close to that in column 1. This means the

[6] In Appendix Table A2, we show that our results are similar if we drop (1) the most and least populated locations, (2) any post office that had more than $1 per person in the county on deposit in 1928, (3) or the southern states that were historically poorer and less integrated into nation's financial market. They also are similar if we control for the fraction that postal savings makes up of all deposits in a location in 1929.

results are not being driven by an attraction of postal savings in the 1910s to areas that would have higher panic intensity in the 1930s.

Second, we examine the role of postal redeposits. As discussed in the background section, most of postal savings were to be redeposited in commercial banks, but relatively few banks received them. While the Post Office never released a list of redepositories, we have found records in the National Archives that document the names of commercial banks that placed collateral bonds with the Post Office in the 1920s and 1930s. These banks were almost certainly receiving redeposits, but the records do not cover banks that provided collateral bonds in the 1910s but did not provide any additional collateral over the period we observe. The records thus capture those banks that were actively receiving redeposits leading up to and during the Great Depression. Column 3 shows the availability of postal savings still leads to a higher probability of bank closure when we control for these observed redeposit banks.

Finally, we examine whether the effect of postal savings varies over time. So far, the closure analysis has focused on the cross-sectional effect of having postal savings in 1928 on bank closure between 1929 and 1935. However, as suggested by the town-level results in Table 1, the lure of postal savings was likely reduced when the FDIC was created to insure commercial bank deposits. In Figure 3, we provide the postal savings coefficients when equation (2) is estimated for each individual closure year (after dropping previous closures) where years are defined as July-June to match postal savings reporting. The repeated cross-section allows all the coefficients in the model to adjust in each year and better captures any period-specific shocks that might affect particular types of banks or locations. As expected, the effect of postal savings declines in the period July 1932 through June 1933 and is completely eliminated after. Matching

the town-level deposit results, the evidence suggests that the effect of postal savings was through its federal guarantee.

The year-by-year results indicate that the effect of postal saving in Table 2 is not driven by some unobserved location-specific factor. If postal savings banks were located in towns where commercial banks were always more likely to close, then it should be the case that they are correlated with exit in all years. To test this further, we utilize the time series of postal savings deposits used in Table 1. Appendix Table A1 examines whether increases in postal deposits or depositors each year are associated with bank closures in that year while including a full set of county fixed effects and a full set of year fixed effects.[7] The data show that increases in postal banking are associated with increased rates of bank closure in the same town-years. This panel variation in postal savings provides additional evidence that commercial banks were closing in the specific areas where postal savings deposits were simultaneously rising rather than all areas with postal savings. There is not some unobserved location fixed effect driving our findings.

4.2 Instrumental Variables Analysis

The nationwide analysis shows a strong correlation between bank closure and depositors' ability to make insured deposits at a local post office. To isolate exogenous variation in postal savings, we make use of a structural change that took place in the mid-1910s. Within just two years of the establishment of postal savings, virtually every incorporated place had postal savings, as did thousands of rural post offices. However, during WWI, the Postmaster General

[7] This analysis uses different variation from the one in Figure A2. Figure A2 is testing whether postal savings availability in other years predict bank closures during 1929-1935 in individual cross-sections, whereas Table A1 uses a panel analysis of annual variation in postal savings to predict annual closures during the Depression.

ordered 7,414 of 12,820 post offices to stop taking deposits.[8] These closures largely set the distribution of postal savings offices through 1928 though additional post offices stopped taking deposits over the 1920s and a few post offices started taking them.

The Post Office did not provide guidelines for which local post offices would be forced to stop taking deposits, but their initial approach is visible in the data. Some of it was due to post office size. Nearly all 1st class postal depositories, which were in the largest towns and cities, were kept open. The decisions for 2nd, 3rd, and 4th class postal depositories appear to be determined by depositors in those first few years. Specifically, of depositories in 2nd-4th class post offices where we observe exactly 1 depositor at the 1913/1914 year-end snapshots, less than 2.8% of them closed by 1915 compared to 52.8% of those where we do not observe any depositors.[9] The Post Office followed a similar pattern in the following year, nearly eliminating postal savings offices with zero depositors. As seen in Figure 4, more than 94 percent of post offices with zero depositors lost their depository by 1916, yet less than 40% of depositories with 1 depositor did (even though most held less than $5 on deposit). In fact, despite additional closures, having a single depositor in 1913-1915 more than tripled the chances that a post office would still offer postal savings more than a decade later.

In our IV analysis, we use this early structural shift to isolate exogeneous variation in postal savings availability. Specifically, we examine banks in locations that had 2nd-4th class post offices with postal savings that had either 0 or 1 depositors in 1913/1914 or 1914/1915 (see geographic distribution in Figure 5) and use the presence of having only 1 depositor as an instrument for postal savings availability in 1916. While having 1 depositor also significantly

[8] Reported in Appendix Table A3, those locations that had a postal savings bank before 1928 but lost it did not experience a higher bank closure rate than those locations that never established postal savings.
[9] In Appendix Figure A3, we display the distribution of depositors in postal savings banks in 1913. The figure shows that many post offices had very few depositors and thus our choice of post offices with 0 or 1 depositors is not a narrow section of offices.

predicts postal savings availability in 1928, this intent to treat style approach concentrates on the choices we know are closely related to the presence of that single depositor. As seen in Figure 4, many 1-depositor places lost the ability to offer postal savings between 1916 and 1928, and a few 0 depositor places regained it. Our instrument appears as good as random to average observable factors, but those that lost or regained postal savings may have had some unobserved characteristic. For instance, several of the 1 depositor locations that lost postal savings continued to have low usage whereas many of the 0 depositor locations that reopened were in areas affected by crises. By choosing 1916 postal savings availability, these potential threats cannot affect our results, and the estimate should be biased downward.

The benefits of the IV are that all locations with 0 or 1 depositors chose to take postal savings initially and the choice of a single person in an area to put even $1 on deposit was likely as good as random, especially as it relates to banking outcomes 15 years later. To put it another way, the difference of a single depositor was unlikely to have responded to or shifted commercial bank behavior. The near perfect prediction power of having 0 depositors increases our confidence that the IV analysis is capturing exogenous variation in the availability of postal savings rather than underlying political, financial, or economic factors.

Towns with 0 depositors and those with exactly 1 depositor during 1913-1915 were, aside from postal savings availability, quite similar prior to the Great Depression. Banks in the two sets of towns were also very similar. In contrast to the full sample reported in the top panel of Figure 6, the bottom panel shows that the 1 depositor indicator does not significantly relate to any of the characteristics or growth over the 1920s. While the balance sheet variables differences are all statistically insignificant, they generally imply that banks in locations with one depositor should have been less likely to close. Using the estimates from column 1 of Table 2 to predict the

overall probability of closure, the average bank in 1-depositor towns was 0.52 percentage points less likely to close based on its balance sheet than the average bank in 0-depositor towns. This means our instrument is pushing away from the finding that postal savings causes bank closures.

Using banks in locations that had a 2nd-4th class post office that accepted deposits but had 0 or 1 depositors in 1913-15, our IV specification, estimated via 2SLS, is as follows:

$$Closure_i = a + \beta_1 BalSheet_i + \beta_2 \widehat{Postal}_{1916,i} + \beta_3 X_i + \beta_4 State_i + e_i \quad (3A)$$

$$Postal_{1916,i} = a + \pi I(Depositors = 1)_{i_i} + \xi BalSheet_i + \xi X_i + u_i \quad (3B)$$

where the second-stage regression in equation (3A) is essentially the same as equation (2) above. The only difference is the indicators for being in a Central Reserve or Reserve City are dropped, as no towns in our IV sample was either; $\widehat{Postal}_{1916,i}$ is now a predicted value, based on the results of the first-stage regression. In the first-stage regression in equation (3B), the indicator for having an active postal savings bank in 1916 (just after the closures dictated by the 0/1 depositor cutoff) is regressed on an indicator for whether the postal bank had 1 depositor in 1913-1915 ($I(Depositors = 1)_i$) as well as the same controls as in the second stage.

The estimated coefficients for the first stage equation (3B) are provided in the bottom panel of Table 3. The treatment effect of having 1 depositor in 1913-1915 (as opposed to having zero) is statistically and economically significantly correlated with having an open postal savings bank in 1916. Places with 1 depositor in 1913-1915 were 52.25 percentage points more likely to have an open postal savings bank in 1916. The first-stage is extremely strong, owing to the strong correlation between having 0 depositors and a post office losing postal savings by 1916. The Kleibergen-Paap Wald F statistic of 1,200 and a Cragg-Donald Wald F statistic of 272.6, well above the Stock-Yogo weak IV critical value (16.38).

The estimated coefficients for the second stage equation (3A) in the top panel of Table 3 confirm the findings in Table 2. Being a bank in a postal savings town increases the likelihood of closure during the Depression by 10.8 percentage points. Compared to the baseline mean of bank failure (0.422) being a postal savings town increases the likelihood of bank closure by more than 25%. Therefore, even though the instrument isolates the exogeneous variation in postal deposit availability, we find larger effects of postal savings deposits on bank stability than the OLS.

We re-estimate the IV model by controlling for the county-level failure rate of commercial banks (column 2), and controlling for whether a bank received postal redeposits (column 3). As in our OLS regressions, these robustness checks do not significantly change our estimates. Given the difference in postal savings' effect before and after the establishment of the FDIC in Figure 3, we drop banks that closed in 1933 or later in column 4 to show that the postal savings was more related to earlier closures.

Column 5 of Table 3 estimates a reduced form specification of the IV. Instead of using the predicted availability of postal savings in the second stage, we use the indicator for having exactly 1 depositor in 1913-1915 to show the direct effect of the instrument. Our results indicate that banks in places with exactly 1 depositor in 1913-1915 were more likely to close during the Depression. The coefficient shows that banks in towns with a single depositor in 1913-1915 were 5.69 percentage points more likely to close than towns with 0 depositors, despite the fact that they had identical postal savings availability before 1916, and similar commercial banking activity in 1928.

The IV estimates are likely larger than the OLS estimates for three reasons. First, omitted variable bias in the form of general banking demand (which would increase the likelihood of having postal savings and decrease the likelihood of banking failures) should bias our OLS

estimates towards zero compared to the IV. Second, there are significant differences between the sample used in the main OLS and IV regressions. While many towns only had 0 or 1 depositors, the banks in these towns were smaller than in the full sample (the average assets was $594,805 in the IV sample, and $3,440,482 for all banks). A rise in postal savings would thus have had an especially large effect on the limited liquidity of banks in the IV sample (where postal deposits went from $628 in 1928 to $23,234 in 1935). Third, very few banks in the IV sample would have received postal redeposits. For instance, the number of banks we see depositing collateral bonds at the Post Office was much smaller (2.26% in the IV sample compared to 10.01% for all banks). These factors mean that this subset of banks may have been especially likely to be negatively affected by competition with a federally-insured deposit option.

These results show that the availability of postal savings depositories, which were federally insured, significantly increased the likelihood that commercial banks in the same town would close during the Great Depression. However, the effect is eliminated after the FDIC was created to insure commercial banks. The IV analysis helps avoid any unobserved location heterogeneity and isolate a causal effect of postal savings on commercial bank closures.

4.3 Mechanism – Liquidity Risk

Supporting the contemporary accounts of depositors removing their funds from commercial banks and putting them into postal banks, our previous town-level analysis showed that the increase in postal saving deposits corresponded to a decrease in commercial bank deposits during the same town-year. These withdrawals would have represented an intense liquidity risk for commercial banks and could be responsible for the association between the availability of local postal savings and higher probability of closure for surrounding commercial

banks. This section tests this assertion. If our results are driven by such withdrawals, then a bank's level of liquidity should have been even more important for banks located near postal savings than for others. We, therefore, expand the analysis by adding an interaction between the postal savings indicator and each bank's reserves in 1928 to equation (2). The model is:

$$Closure_i = a + \beta_1 Postal_{1928,i} + \beta_2 Postal_i X Reserves_i + \beta_3 BalSheet_i + \beta_4 X_i + \beta_5 State_i + e_i \quad (4)$$

where $Reserves_i$ is the level of the bank i's cash and due from banks to total deposits in 1928, and the rest of the variables retain their previous definitions. The interaction tests whether high liquidity banks had a higher or lower closure effect of being near a postal savings bank while separate controls for $Reserves_i$ and $Postal_i$ capture the effects of liquidity and postal savings respectively.

Column (1) of Table 4 reports the estimates of equation (4). The larger coefficient on the postal savings indicator compared to Table 2 shows that banks with low levels of reserves were especially likely to close in places with postal savings. The negative coefficient on the interaction term shows that the effect of postal savings on the likelihood that a bank closed decreased as that bank's reserves increased. For instance, moving from the 25th percentile of reserves (0.118) to the 75th percentile (0.234) decreased the effect of postal savings on closure from 4.32 to 2.47 percentage points. The effect of reserves on all banks remains negatively correlated with closure. Depositors throughout the nation were withdrawing their money and thus all banks needed liquidity to survive. However, a bank needed even more liquidity to survive when it was near a post office that accepted deposits.

We also find a similar liquidity effect by estimating the IV regression separately for those banks with above median levels of reserves and those with below median levels. The results in

Table 5 show that banks with higher levels of reserves had much less of an effect of closing when located nearby a post office that accepted deposits than those with lower. Comparing columns 2 and 3 of Table 5, we see that the effect of postal savings in low-liquidity banks was twice as large when compared to high-liquidity banks. Both the OLS and IV evidence suggests that depositor withdrawals were driving the closures associated with postal savings.

The differential liquidity effect raises the question of whether the result is instead driven by overall balance sheet risk (of which liquidity is only a portion). Postal savings did not make loans or have any regulatory power over banks, and as such should not have been primarily correlated with the closures of insolvent banks. We, therefore, calculate the closure probability of every bank's balance sheet based on the coefficients in column (1) of Table 2 and interact that probability with the postal savings indicator. In column 2 of Table 4, the results show that the effect of postal savings was lower on those banks with a higher probability of closure based on their balance sheet. The effect is opposite what would be predicted by column 1 of Table 4. If all balance sheet risk is the same, then the negative coefficient on the liquidity interaction would imply that a higher predicted probability of closure would increase the postal savings effect, but that is not the case. Instead, the availability of postal savings banks had much less of an effect on insolvent banks that were likely to close regardless. The effect of the liquidity interaction remains in column 3 when we simultaneously include the closure probability interaction. Liquidity thus seems to play a unique role in the dynamics we identify.

The result suggests that the effect of postal savings on commercial bank stability operated through depositor withdrawals. It also provides another piece of evidence that we are measuring the true effect of postal savings on commercial banks rather than some unobserved characteristic that was correlated with both postal savings and commercial bank closure. If there was some

unobserved location characteristic, then it should have affected all banks near a postal savings bank and would not have been isolated to those banks with low liquidity.

5. Conclusion

The lack of universal deposit insurance can affect depositor behavior during crises, shifting funds away from uninsured accounts towards insured ones. This dynamic, however, cannot be tested in modern data as nearly every institution is covered by deposit insurance. Instead, we examine whether the existence of a nearby federally-insured deposit opportunity increased the likelihood that banks closed during the Great Depression compared to locations where depositors could withdrawal deposits but did not have a local insured option. The Postal Savings System offered the first federally insured deposits in the United States, allowing people to deposit money in thousands of post offices nationwide. While largely unused for over two decades, the Depression led to a substantial increase in demand for postal accounts by all households, stripping cash out of banks when it was needed the most. Banks in towns with postal savings were more likely to close than in otherwise identical towns without postal savings. The effect of postal savings availability, however, disappears when federal deposit insurance was extended to commercial banks.

The data provide evidence that the availability of postal savings was associated with increased depositor withdrawals at nearby commercial banks compared to banks with no nearby postal savings depository. Not only was there a strong negative relationship between changes in commercial bank deposits and postal savings deposits in the same town and year, but banks needed more reserves to survive when located in the same location as postal savings. Alternatively, banks with the most risky balance sheet position had little effect of postal savings,

suggesting that the availability of deposit insurance only affected certain types of banks and was not isolated to those who were likely to close regardless of postal savings.

While all depositors were fleeing to safe assets during the Depression, the evidence suggests that the presence of a safer, government-guaranteed deposit alternative intensified competitive pressures on vulnerable banks by attracting even more funds away from them. This additional flight to quality may have shielded fleeing depositors from losses at closing banks, but it also accelerated the closure of institutions. Although some of these banks were absorbed through mergers and acquisitions, the destruction of financial capital and severing of established lending relationships contributed to a contraction in credit. The same competition could occur with any government guaranteed asset even something like central bank digital currency. For instance, "too-big-to-fail" banks attracted significant depositors during March 2023, suggesting they were more willing to move funds into a safer deposit option than other safe assets.

These findings advance both our historical understanding of the Great Depression and the current debate about re-establishing the Postal Savings System. Though the system was explicitly designed to avoid competition with banks, we find that such competition nonetheless occurred for two reasons. First, legislators who established postal savings underestimated the appeal of deposit insurance during crises. Postal savings' low fixed rate of interest was not enough to stop depositors from moving their funds during a period of financial uncertainty. Second, the redeposit mechanism of the system was insufficient to insulate banks from competition. The post office only allowed some banks to receive redeposits, leaving most banks fully exposed to the liquidity pressures that resulted from the draw of postal deposits. Therefore, despite significant safeguards and foresight, the guaranteed return and accessibility of postal savings competed deposits away from commercial banks and led to more financial instability.

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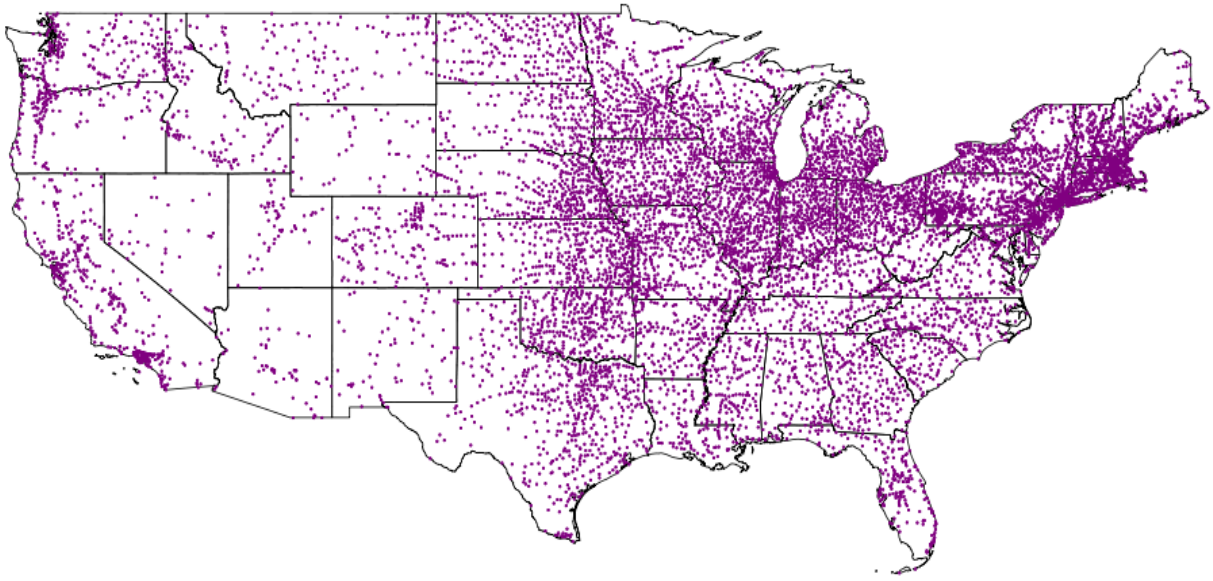
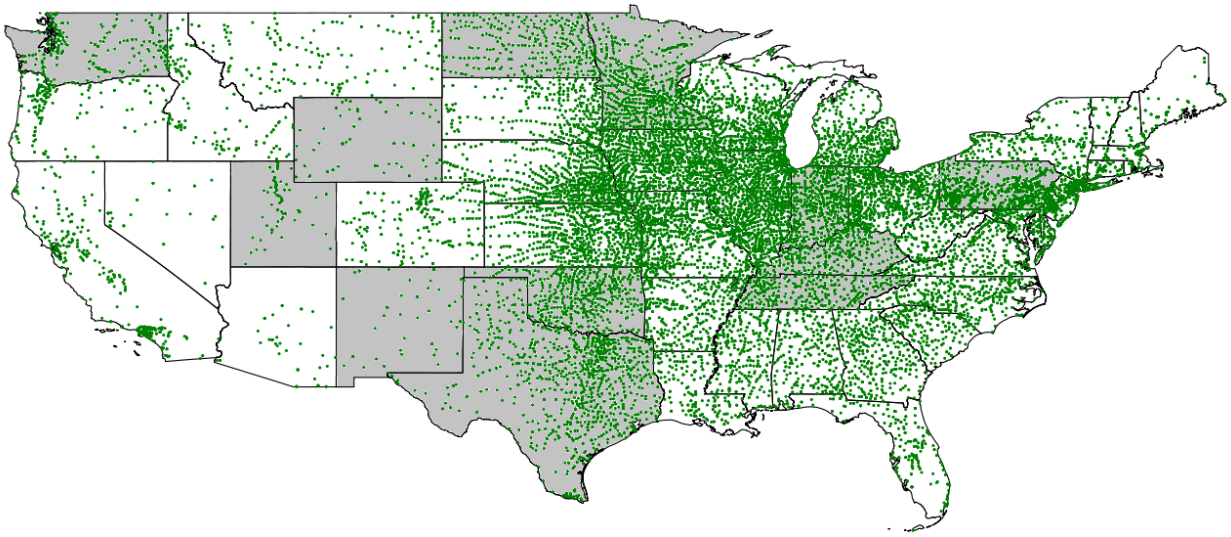
Figure 1: Location of Postal Savings Depositories and Commercial Banks, 1928
Panel A: Postal Savings Depositories

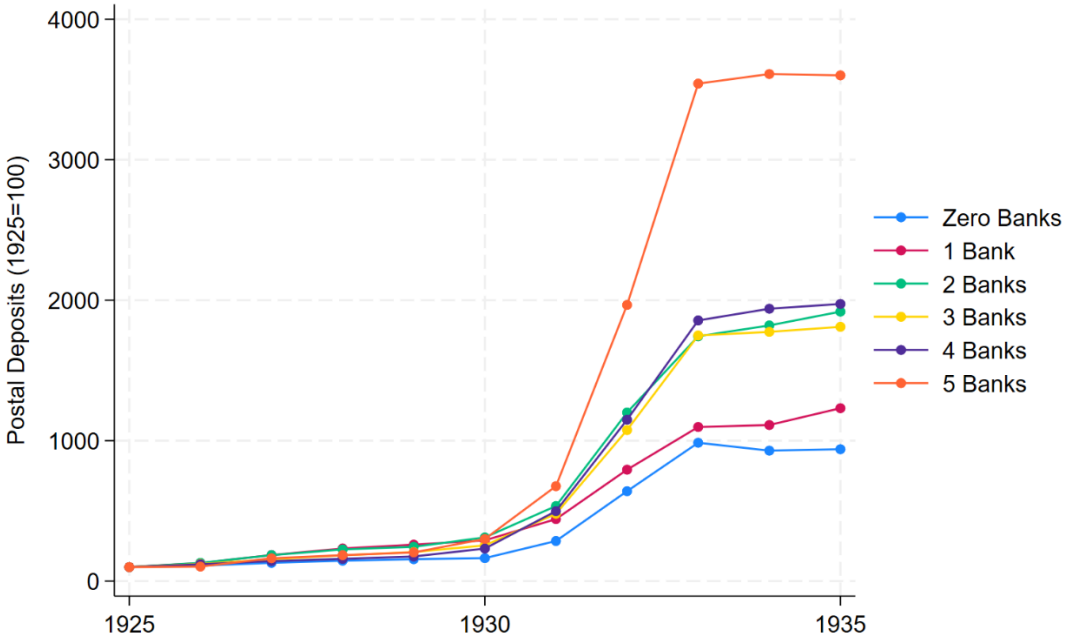


Panel B: Commercial Banks

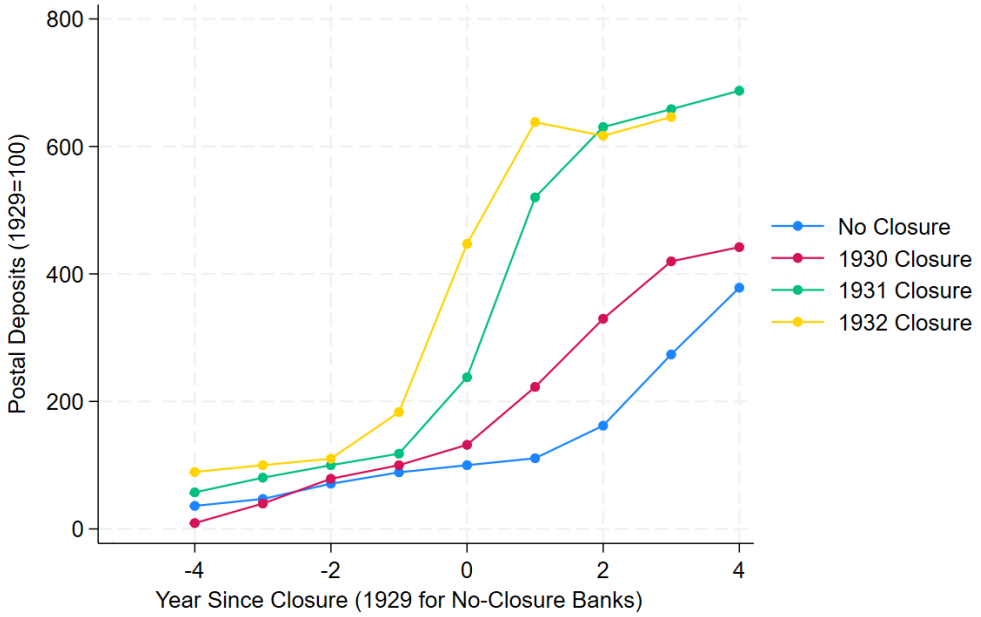


Note: Panel A shows the location of postal savings depositories in operation in 1928. Panel B shows the location of towns with a commercial bank in 1928. The shaded states are those for which we do not have balance sheet data. See Section 2 for the sources of the data.

Figure 2: Value of Postal Deposits (1925-1935)
Panel A: By Number of Banks in Town

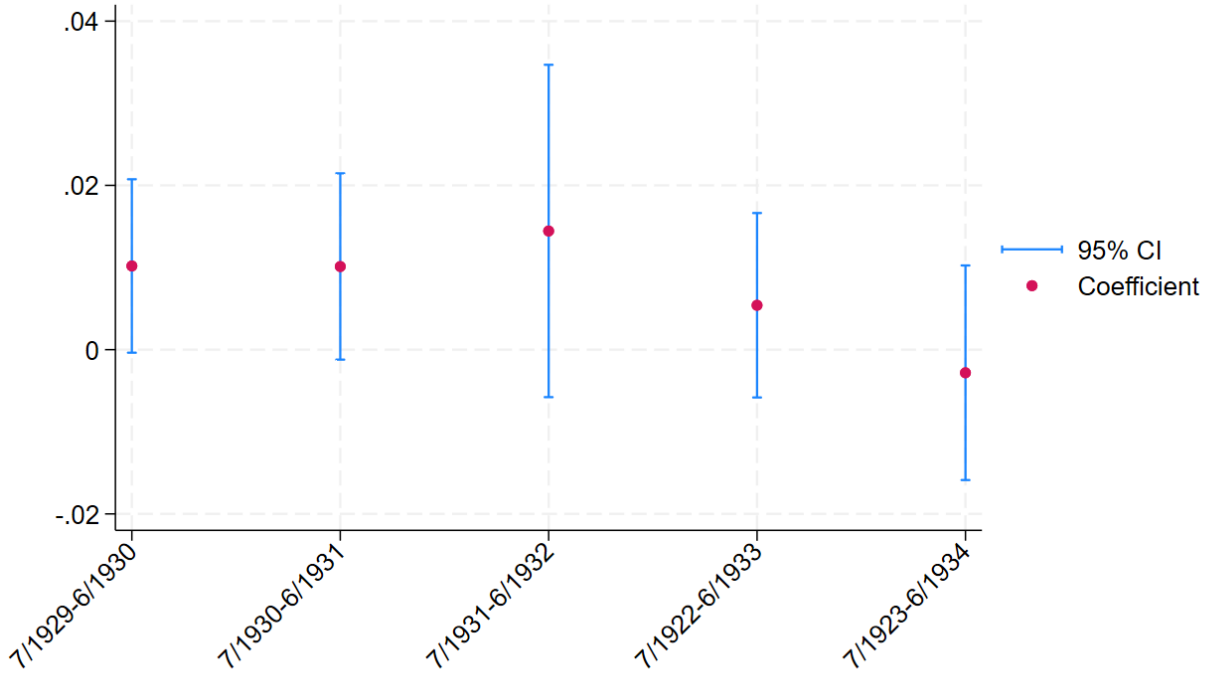


Panel B: By Date of Closure (Only One Bank Towns)



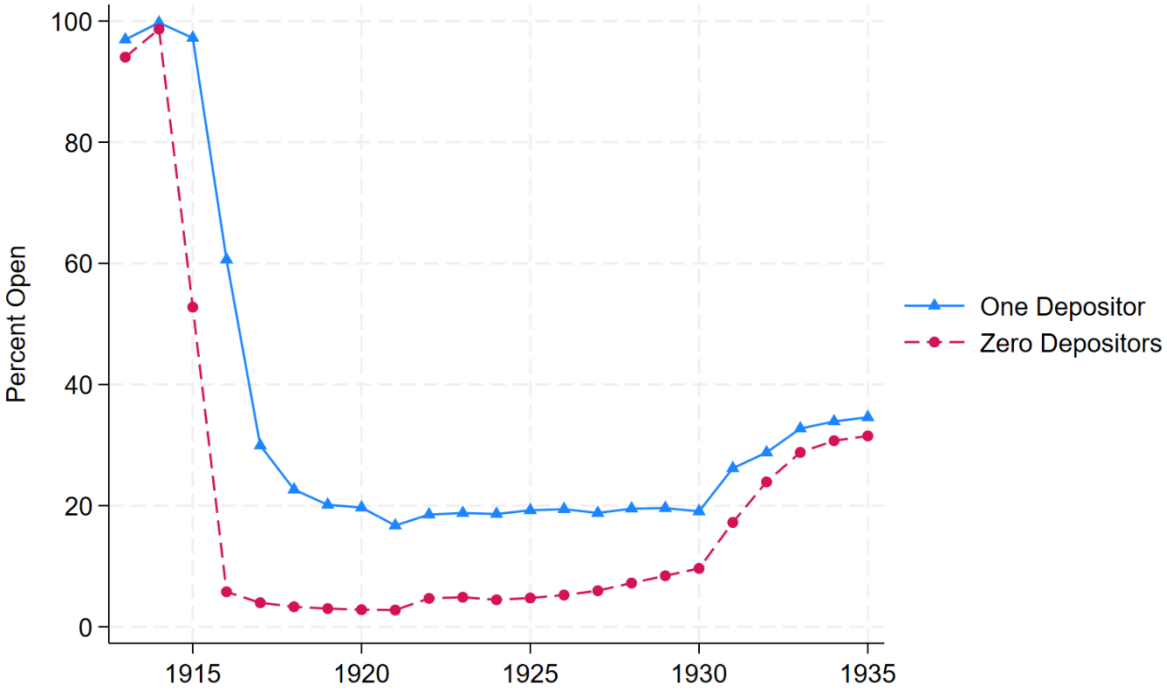
Notes: Panel A shows the relative amount of money on deposit at post office depositories based on the number of banks in the town in 1929. Rates are indexed to 1925 levels of deposits, which is set to a value of 100. Panel B displays the average amount of postal savings deposits (normalized to 100 in 1929) for towns with only one bank in 1929. Time is normalized to the year a bank closed in the town (with zero being the year of closure) except for towns without a closure which are normalized to 1929.

Figure 3: Effect of Postal Savings Availability in 1928 by Closure Year



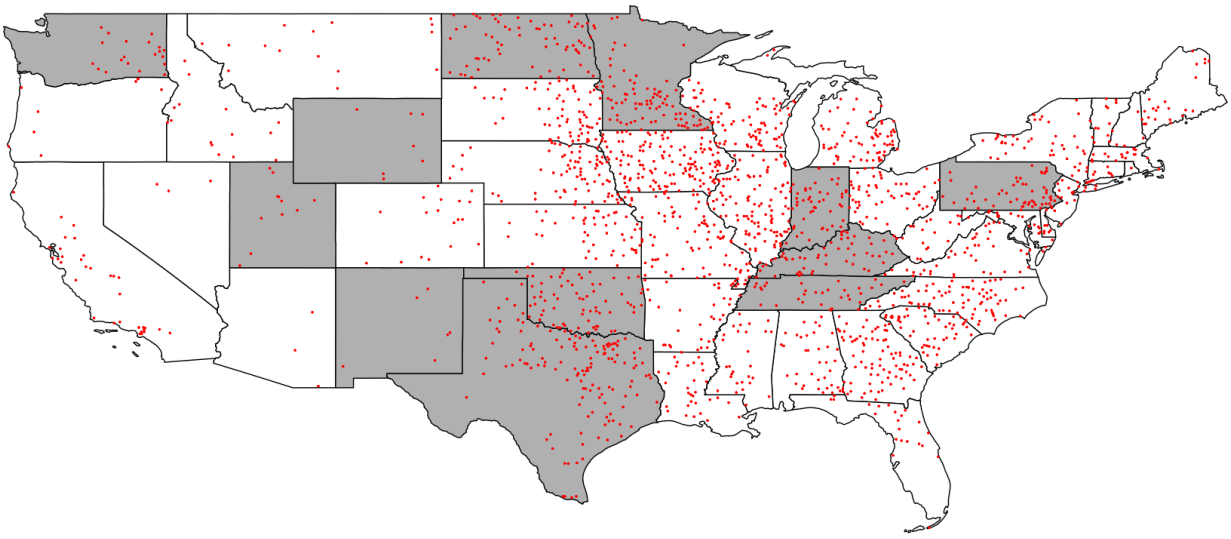
Note: Figure shows the point estimates of the regression described in equation (2), along with the 95% confidence intervals, but estimated for each individual closure year. We drop any bank that had already closed in a previous year. To insure that our measure of bank closures matched that of postal savings, which is measured at the half year, we measure a bank closure for year t to be if a bank closed in the first half of year t or the second half of year t-1.

Figure 4: Survival of Initial Postal Savings Depositories (1913-1935)



Note: Figure shows the percentage of postal depositories that were open in 1914 that remained open in subsequent years. The "One Depositor" group is depositories with exactly one depositor in 1913/1914 or 1914/1915. The "Zero Depositors" group is depositories with no depositors during those years. The sample is all 2nd, 3rd, or 4th class post offices with those specific numbers of depositors.

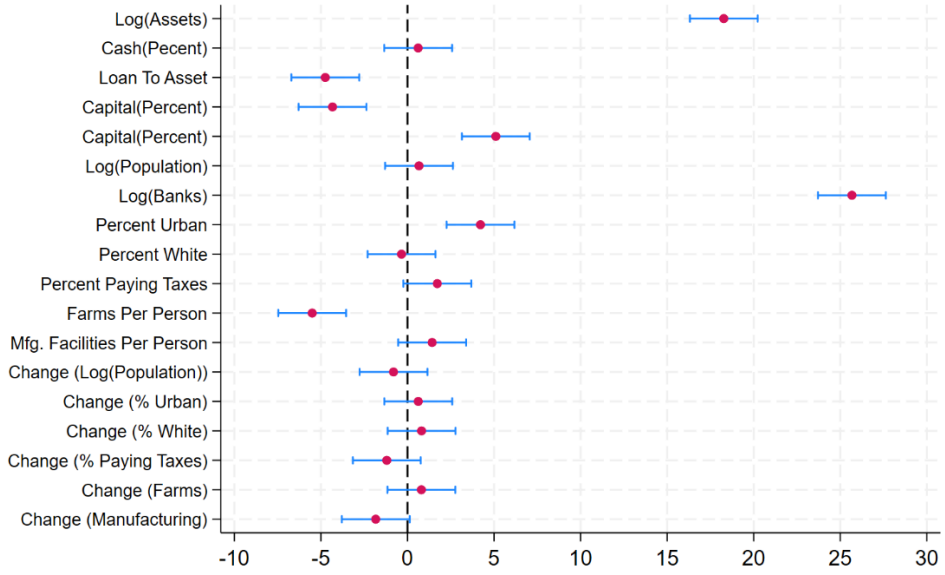
Figure 5: Location of Postal Savings Depositories in IV Sample



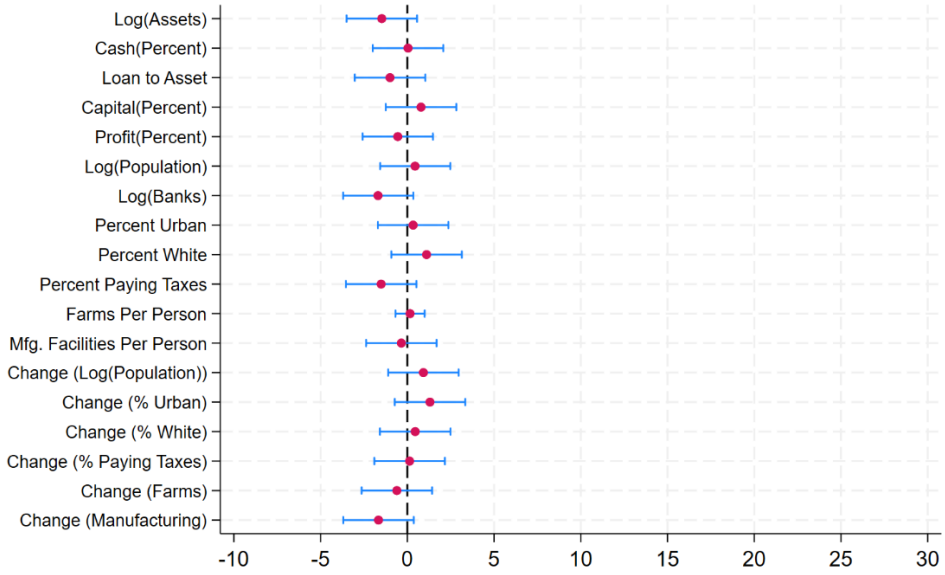
Note: Figure shows the location of all postal savings depositories that were in operation in 1913-1915 and had 0 or 1 depositor. The shaded states are those for which we do not have balance sheet data and are therefore not part of our IV sample.

Figure 6: Regression-Adjusted Sample Statistics

Panel A: Full Sample – With and Without Postal Savings in 1928



Panel B: IV Sample – Postal Savings with either 0 and 1 Depositors in 1913-1915



Note: The top panel shows the differences between towns in our full sample with and without postal savings banks in 1928. The bottom panel shows the differences between towns in our IV sample with 0 depositors and 1 depositor in 1913-1915. The data are aggregated to the town level before obtaining the town and county averages. Bank-level variables are bank-level averages. The variables labeled "Change" denote changes between 1919 and 1929. The coefficients and 95% confidence intervals are from a linear regression with either a dummy variable for having a postal savings bank in 1928 or having 1 depositor in 1913-1915 on the right hand side and each of the variables listed above on the left hand side. The only other co-variates are state-fixed effects.

Table 1: Effect of Postal Savings on Town-Level Deposit Flows (1925-1935)

	Ln(Total Bank Deposits)			Change in Ln(Total Bank Deposits)		
	All	All	Banks Before 1929	All	All	Banks Before 1929
	(1)	(2)	(3)	(4)	(5)	(6)
LnPostal Deposits By Year	-0.097***	-0.117***	-0.106***			
	[0.009]	[0.008]	[0.008]			
LnPostal Deposits By Year * Post-1932		0.095***	0.089***			
		[0.018]	[0.015]			
Change in LnPostal Deposits By Year				-0.046***	-0.048***	-0.049***
				[0.006]	[0.007]	[0.007]
Change in LnPostal Deposits By Year * Post-1932					0.011	0.016
					[0.021]	[0.020]
Town Fixed Effects	Y	Y	Y	Y	Y	Y
Region By Year FE	Y	Y	Y	Y	Y	Y
Observations	78144	78144	75945	71040	71040	69185

Note: The table contains the estimates coefficients from the linear panel regression described in equation (1). Each observation is a town-year and the sample spans 1925-1935. For columns (1), (2), (4), and (5), all towns in the United States that had a post office that accepted postal savings deposits before 1935 are included. For columns (3) and (6), towns without banks before 1929 are dropped. The outcome variable is provided in the column headings. Standard errors clustered at the state level are provided in parentheses. *** p<0.01, ** p<0.05, *p<0.1

Table 2: Effect of Postal Savings Availability on Bank Closure (1929-1935)

	(1)	(2)	(3)
	Baseline	Controlling for Local Panic Intensity	Controlling for Redeposits
Has Postal Savings (1928)	0.0313**	0.0312**	0.0303**
	(0.0145)	(0.0139)	(0.0143)
County Closure Rate	-	0.00202***	-
		(0.00319)	
Postal Redepository (=1)	-	-	0.0115
			(0.0138)
Ln(Assets)	-0.0457***	-0.0467***	-0.0464***
	(0.00848)	(0.00839)	(0.0084)
Cash/Deposits	-0.293***	-0.289***	-0.294***
	(0.0633)	(0.0614)	(0.0631)
Loans/Assets	0.190***	0.185***	0.191***
	(0.0371)	(0.0371)	(0.0370)
(Profits+Capital)/Assets	-0.183**	-0.185**	-0.183*
	(0.0903)	(0.0862)	(0.0904)
Profits/(Profits+Capital)	-0.404***	-0.395***	-0.403***
	(0.0371)	(0.0368)	(0.0370)
Observations	16,755	16,602	16,755
Location Characteristics	Y	Y	Y
State Fed Member Indicator	Y	Y	Y
National Bank Indicator	Y	Y	Y
State Fixed Effects	Y	Y	Y
R-squared	0.105	0.112	0.105

Note: Results from a linear regression. The outcome variable is an indicator for whether a bank closed, for any reason, from 1929-1935. Location characteristics include log of county population, percentage of the population paying federal taxes, the log of manufacturing facilities per capita, the log of farms per capita, the percent of a county that is urban, the percent of county population that is white. We also control for the 10-year change of these county-level variables, and for whether the town was a Central Reserve or Reserve City. Standard errors clustered at the state level are provided in parentheses. *** p<0.01, ** p<0.05, *p<0.1

Table 3: IV Regression of Postal Savings Availability on Bank Closure (1929-1935)

	(1)	(2)	(3)	(4)	(5)
				1929-1932	Reduced
	Second Stage	Second Stage	Second Stage	Second Stage	Form
Has Postal Savings (1916)	0.108***	0.110***	0.109***	0.109***	-
	(0.0284)	(0.030)	(0.229)	(0.0257)	
County Closure Rate	-	0.00134***	-	-	-
		(0.00051)			
Postal Redepository (=1)	-	-	-0.0981	-	-
			(0.0628)		
One Depositor in 1913/1915	-	-	-		0.0569***
					(0.015)
Ln(Assets)	-0.0508***	-0.0547**	-0.0492**	-0.0342	-0.0483**
	(0.022)	(0.024)	(0.0226)	(0.0237)	(0.0226)
Cash/Deposits	-0.350**	-0.355**	-0.346**	-0.230	-0.329*
	(0.176)	(0.172)	(0.175)	(0.172)	(0.178)
Loans/Assets	0.349***	0.344***	0.350***	0.5421***	0.356***
	(0.085)	(0.083)	(0.086)	(0.0735)	(0.091)
(Profits+Capital)/Assets	-0.358	-0.405*	-0.353	-0.320	-0.375
	(0.246)	(0.243)	(0.246)	(0.214)	(0.251)
Profits/(Profits+Capital)	-0.426***	-0.413***	-0.427***	-0.482***	-0.427***
	(0.055)	(0.055)	(0.056)	(0.0528)	(0.0568)
Observations	2,481	2,445	2,481	2,177	2,481
Location Characteristics	Y	Y	Y	Y	Y
State Fed Member Indicator	Y	Y	Y	Y	Y
National Bank Indicator	Y	Y	Y	Y	Y
State Fixed Effects	Y	Y	Y	Y	Y
Cragg-Donald Wald F Statistic	1,200	1,169	1,205	1,064	-
Kleibergen-Paap Wald F statistic	272.6	267.1	276	258.4	-
R-Squared (Reduced Form)	-	-	-	-	0.114
Baseline Closure Rate	0.422	0.425	0.422	0.341	0.422
	First Stage				
One Depositor in 1913/1915	0.525***	0.523***	0.525***	0.528***	
	(0.0318)	(0.0207)	(0.0316)	(0.0210)	
Observations	2,481	2,445	2,481	2,177	
Bank Characteristics	Y	Y	Y	Y	
Location Characteristics	Y	Y	Y	Y	
State Fed Member Indicator	Y	Y	Y	Y	
National Bank Indicator	Y	Y	Y	Y	
State Fixed Effects	Y	Y	Y	Y	
R-Squared (First Stage)	0.355	0.366	0.354	0.137	

Note: Column 1 of the top panel shows the results of an instrumental variables regression. The outcome variable is an indicator for whether a bank closed, for any reason, from 1929-1935 and the reduced form regression in column 5. The bottom panel shows the first-stage regression for the IV regression. The sample contains all towns for which we have balance sheet data and that there were either 0 or 1 depositors in the local postal depository in 1913-1915. Location characteristics include: log of county population, percentage of the population paying federal taxes, the log of manufacturing facilities per capita, the log of farms per capita, the percent of a county that is urban, and the percent of county population that is white. Bank characteristics include: the logarithm of total assets, loans to assets, paid-in capital, surplus, and undivided profits to assets (i.e., capital to assets), surplus and undivided profits to paid-in capital, surplus, and undivided profits (i.e., profit to capital), and cash and due from banks to total deposits (i.e., cash to deposits). We also control for the 10-year change of these county-level variables. Standard errors clustered at the state level are provided in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4: Effect of Postal Savings Availability on Bank Closure (1929-1935), With Interaction Terms for Liquidity and Balance Sheet Risk

	(1)	(2)	(3)
Has Postal Savings (1928)	0.0609**	0.0561***	0.0899***
	(0.0238)	(0.0183)	(0.0313)
Has Postal Savings (1928)	-0.160*	-	-0.174*
X Cash/Deposits	(0.0825)		(0.0911)
Has Postal Savings (1928)	-	-0.195***	-0.205**
X Closure Probability		(0.0715)	(0.0805)
Ln(Assets)	-0.0453***	-0.0524***	-0.0523***
	(0.00842)	(0.00928)	(0.00952)
Cash/Deposits	-0.233***	-0.310***	-0.246***
	(0.0662)	(0.0641)	(0.0670)
Loans/Assets	0.194***	0.208***	0.212***
	(0.0406)	(0.0375)	(0.385)
(Profits+Capital)/Assets	-0.175*	-0.215**	-0.209**
	(0.0911)	(0.0863)	(0.0868)
Profits/(Profits+Capital)	-0.408***	-0.442***	-0.449***
	(0.0371)	(0.0366)	(0.0360)
Observations	16,755	16,755	16,755
Location Characteristics	Y	Y	Y
State Fed Member Indicator	Y	Y	Y
National Bank Indicator	Y	Y	Y
State Fixed Effects	Y	Y	Y
R-squared	0.106	0.106	0.106

Note: Results from a linear regression. The outcome variable is an indicator for whether a bank closed, for any reason, from 1929-1935. Closure Probability is estimated by applying each bank's balance sheet statistics to the coefficients on those balance sheet statistics in column (1) of Table 1. The sample contains all banks for which we have data. Location characteristics include: log of county population, percentage of the population paying federal taxes, the log of manufacturing facilities per capita, the log of farms per capita, the percent of a county that is urban, the percent of county population that is white, and whether the town was a Central Reserve or Reserve City. We also control for the 10-year change of county-level variables. Standard errors clustered at the state level are provided in parentheses. *** p<0.01, ** p<0.05, *p<0.1

Table 5: IV Regression of Postal Savings Availability on Bank Closure (1929-1935), Split By Bank Reserves

	(1)	(2)	(3)
	All Banks	Below Median Reserves	Above Median Reserves
Has Postal Savings (1916)	0.108***	0.137***	0.0659
	(0.0284)	(0.0398)	(0.0428)
Ln(Assets)	-0.0508***	-0.0507*	-0.0487
	(0.022)	(0.0273)	(0.0324)
Cash/Deposits	-0.350**	-0.0074	-0.107
	(0.176)	(0.357)	(0.163)
Loans/Assets	0.349***	0.274**	0.410***
	(0.085)	(0.131)	(0.145)
(Profits+Capital)/Assets	-0.358	-0.417	-0.263
	(0.246)	(0.375)	(0.269)
Profits/(Profits+Capital)	-0.426***	-0.375***	-0.483***
	(0.055)	(0.097)	(0.0747)
Observations	2,418	1,240	1,241
Location Characteristics	Y	Y	Y
State Fed Member Indicator	Y	Y	Y
National Bank Indicator	Y	Y	Y
State Fixed Effects	Y	Y	Y
Cragg-Donald Wald F Statistic	1,200	583.4	615
Kleibergen-Paap Wald F statistic	272.6	244	232
Baseline Closure Rate	0.422	0.444	0.400

Note: Table shows the results of an instrumental variables regression. The outcome variable is an indicator for whether a bank closed, for any reason, from 1929-1935. The full sample contains all towns for which we have balance sheet data and that there were either 0 or 1 depositors in the local postal depository in 1913-1915. It is then broken up by the bank's reserve level in 1928. Column 2 is banks with reserve levels below the median (0.1742). Column 3 is all banks above the median. Location characteristics include: log of county population, percentage of the population paying federal taxes, the log of manufacturing facilities per capita, the log of farms per capita, the percent of a county that is urban, and the percent of county population that is white. We also control for the 10-year change of these county-level variables. Standard errors clustered at the state level are provided in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A1: Effect of Postal Savings Availability on Bank Closure (1929-1935) – Using Panel Regressions with County-Fixed Effects

	(1)	(2)	(3)	(4)
	All Banks	Banks in Postal Savings Towns	All Banks	Banks in Postal Savings Towns
LnPostal Deposits By Year	0.000395**	0.00221***	-	-
	(0.000190)	(0.00036)		
LnPostal Depositors By Year	-	-	0.00316***	0.00369***
			(0.000475)	(0.00652)
Bank Characteristics	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y
County Fixed Effects	Y	Y	Y	Y
Observations	117,292	56,868	117,292	56,868
R-squared	0.049	0.057	0.049	0.057

Note: Results from a linear regression. The outcome variable is an indicator for whether a bank closed, for any reason, from 1929-1935. The primary explanatory variable for Columns 1 and 2 is the log of the amount on deposits (+1) in a town's Postal Savings bank. The primary explanatory variable for Columns 3 and 4 is the log of the number on depositors (+1) in a town's Postal Savings bank. The sample for columns 1 and 3 is all banks for which we have balance sheet data. The sample for columns 2 and 4 is banks in towns that had a postal depository in 1928. *** p<0.01, ** p<0.05, *p<0.1

Table A2: Effect of Postal Savings Availability on Bank Closure - Robustness Checks

	(1)	(2)	(13)
	Banks in Towns with 2rd or 3rd Class Post Offices	Dropping Large Postal Depositories	Dropping Southern States
Has Postal Savings (1928)	0.0267**	0.0348**	0.0317**
	(0.0127)	(0.0135)	(0.0155)
Ln(Assets)	-0.0534***	-0.0444***	-0.0452***
	(0.0115)	(0.0097)	(0.00937)
Cash/Deposits	-0.411***	-0.298***	-0.318***
	(0.0967)	(0.0622)	(0.0768)
Loans/Assets	0.239***	0.202***	0.182***
	(0.0429)	(0.0413)	(0.0405)
(Profits+Capital)/Assets	-0.430***	-0.216**	-0.181**
	(0.155)	(0.093)	(0.105)
Profits/(Profits+Capital)	-0.373***	-0.422***	-0.413***
	(0.0402)	(0.036)	(0.0398)
Observations	8,415	15,511	14,987
Location Characteristics	Y	Y	Y
State Fed Member Indicator	Y	Y	Y
National Bank Indicator	Y	Y	Y
State Fixed Effects	Y	Y	Y
R-squared	0.107	0.110	0.108

Note: Results from a linear regression. The outcome variable is an indicator for whether a bank closed, for any reason, from 1929-1935. Column 1 drops banks in towns that do not have a 2nd or 3rd class post office. Column 2 drops any postal depositories that are holding an amount larger than the population of the county. Column 3 drops all Southern states from our sample. Location characteristics include log of county population, percentage of the population paying federal taxes, the log of manufacturing facilities per capita, the log of farms per capita, the percent of a county that is urban, the percent of county population that is white. We also control for the 10-year change of these county-level variables and for whether the town was a Central Reserve or Reserve City. Standard errors clustered at the state level are provided in parentheses. *** p<0.01, ** p<0.05, *p<0.1

Table A3: Effect of the Level of Postal Savings in 1928 on Bank Closure (1929-1935)

	(1)	(2) Banks in Postal Savings Towns	(3)	(4) Banks in Postal Savings Towns
	All Banks		All Banks	
LnPostal Deposits (1928)	0.00566***	0.00678***	-	-
	(0.00192)	(0.00207)		
LnPostal Depositors (1928)	-	-	0.0154***	0.0180***
			(0.00497)	(0.00569)
Ln(Assets)	-0.0517***	-0.0457***	-0.0536***	-0.0490***
	(0.00825)	(0.00727)	(0.00828)	(0.00758)
Cash/Deposits	-0.298***	-0.328***	-0.302***	-0.339***
	(0.0642)	(0.0927)	(0.0645)	(0.0913)
Loans/Assets	0.192***	0.178***	0.190***	0.175***
	(0.0375)	(0.0309)	(0.0380)	(0.0295)
(Profits+Capital)/Assets	-0.209**	-0.304**	-0.219**	-0.318**
	(0.0892)	(0.123)	(0.0899)	(0.120)
Profits/(Profits+Capital)	-0.394***	-0.391***	-0.391***	-0.386***
	(0.0369)	(0.0480)	(0.0639)	(0.0480)
Location Characteristics	Y	Y	Y	Y
State Fed Member Indicator	Y	Y	Y	Y
National Bank Indicator	Y	Y	Y	Y
State Fixed Effects	Y	Y	Y	Y
Observations	16,755	8,089	16,755	8,089
R-squared	0.106	0.123	0.107	0.124

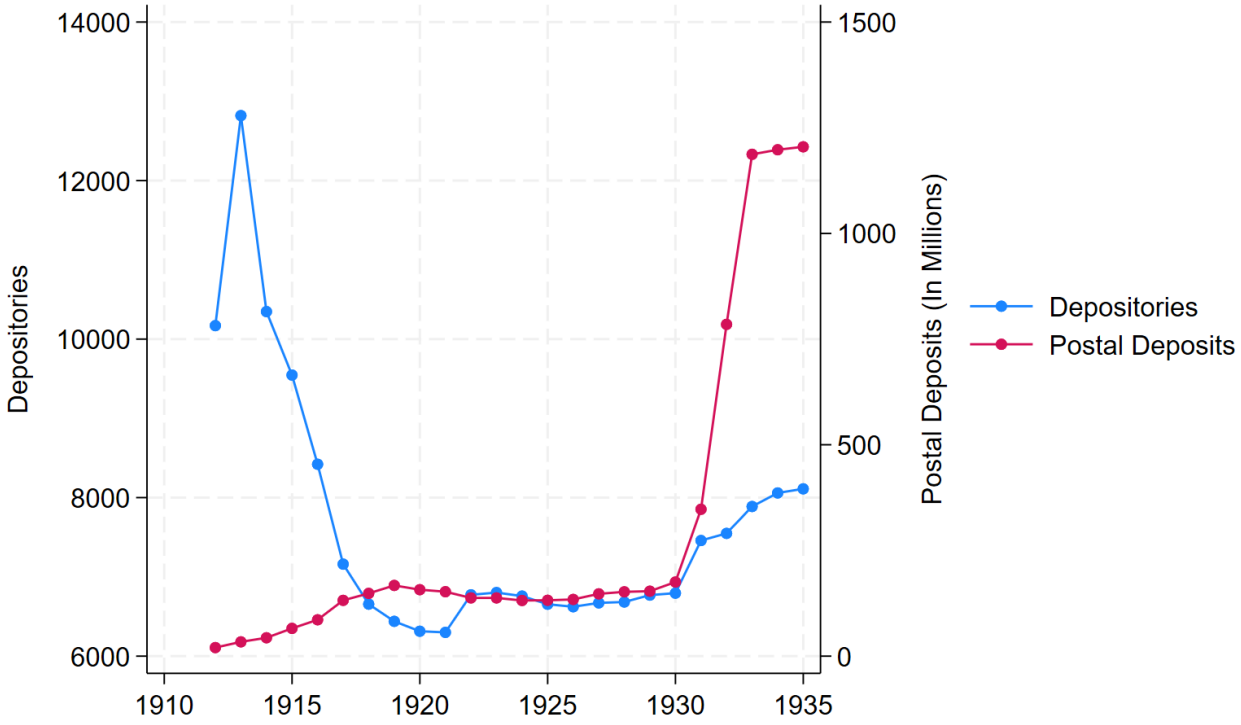
Note: Results from a linear regression. The outcome variable is an indicator for whether a bank closed, for any reason, from 1929-1935. The primary explanatory variable for Columns 1 and 2 is the log of the amount on deposits (+1) in a town's Postal Savings bank. The primary explanatory variable for Columns 3 and 4 is the log of the number on depositors (+1) in a town's Postal Savings bank. The sample for columns 1 and 3 is all banks for which we have balance sheet data. The sample for columns 2 and 4 is banks in towns that had a postal depository in 1928. Location characteristics include log of county population, percentage of the population paying federal taxes, the log of manufacturing facilities per capita, the log of farms per capita, the percent of a county that is urban, the percent of county population that is white, and whether the town was a Central Reserve or Reserve City. We also control for the 10-year change of county-level variables. Standard errors clustered at the state level are provided in parentheses. *** p<0.01, ** p<0.05, *p<0.1

Table A4: Effect of Postal Savings Availability on Bank Closure – Controlling for Post Offices that Stopped Taking Postal Savings

	(1)
Has Postal Savings (1928)	0.0233
	(0.0186)
Lost Postal Savings (1913-1928)	-0.0124
	(0.0165)
Ln(Assets)	-0.0449***
	(0.0088)
Cash/Deposits	-0.295***
	(0.00636)
Loans/Assets	0.190***
	(0.037)
(Profits+Capital)/Assets	-0.182*
	(0.0907)
Profits/(Profits+Capital)	-0.405***
	(0.0370)
Observations	16,755
Location Characteristics	Y
State Fed Member Indicator	Y
National Bank Indicator	Y
State Fixed Effects	Y
R-Squared	0.105

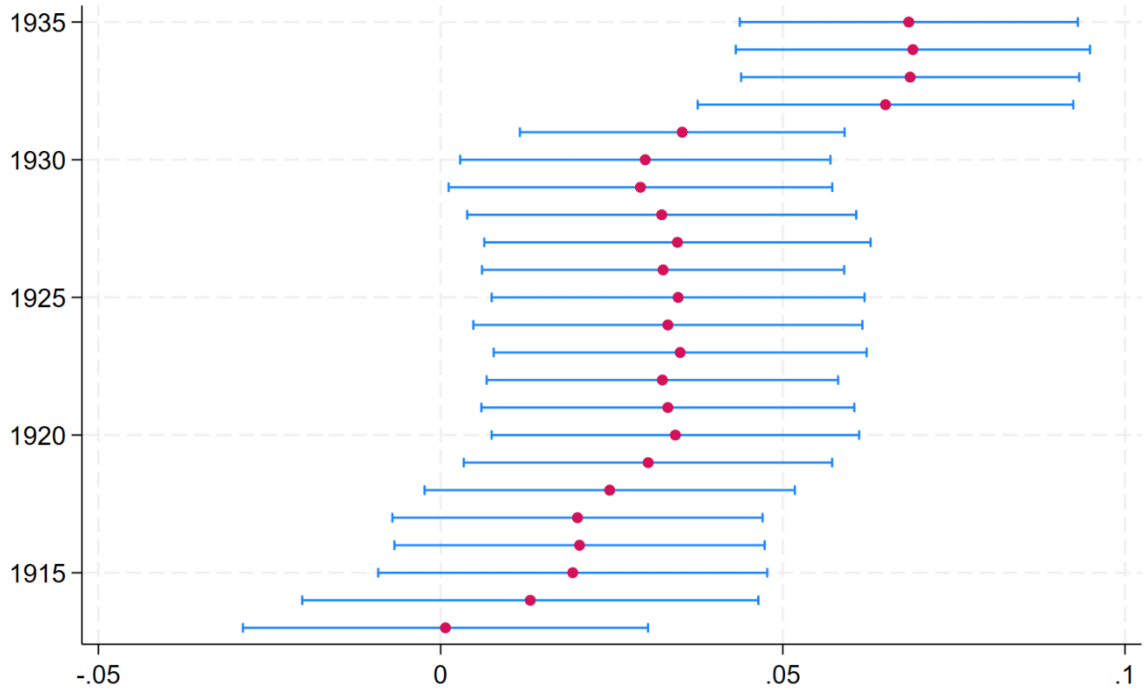
Note: Results are from a regression that is identical to Table 1, Column 1, but with the inclusion of an indicator variable equal to 1 if a town had postal savings at any point but lost it. Therefore, the coefficients for both "Has Postal Savings (1928)" and "Lost Postal Savings (1913-1927)" measure the likelihood of closure against a third (omitted) category: towns that never has postal savings. Location characteristics include: log of county population, percentage of the population paying federal taxes, the log of manufacturing facilities per capita, the log of farms per capita, the percent of a county that is urban, the percent of county population that is white, and whether the town was a Central Reserve or Reserve City. We also control for the 10-year change of county-level variables. Standard errors clustered at the state level are provided in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Figure A1: Aggregate Postal Banking Statistics (1912-1935)



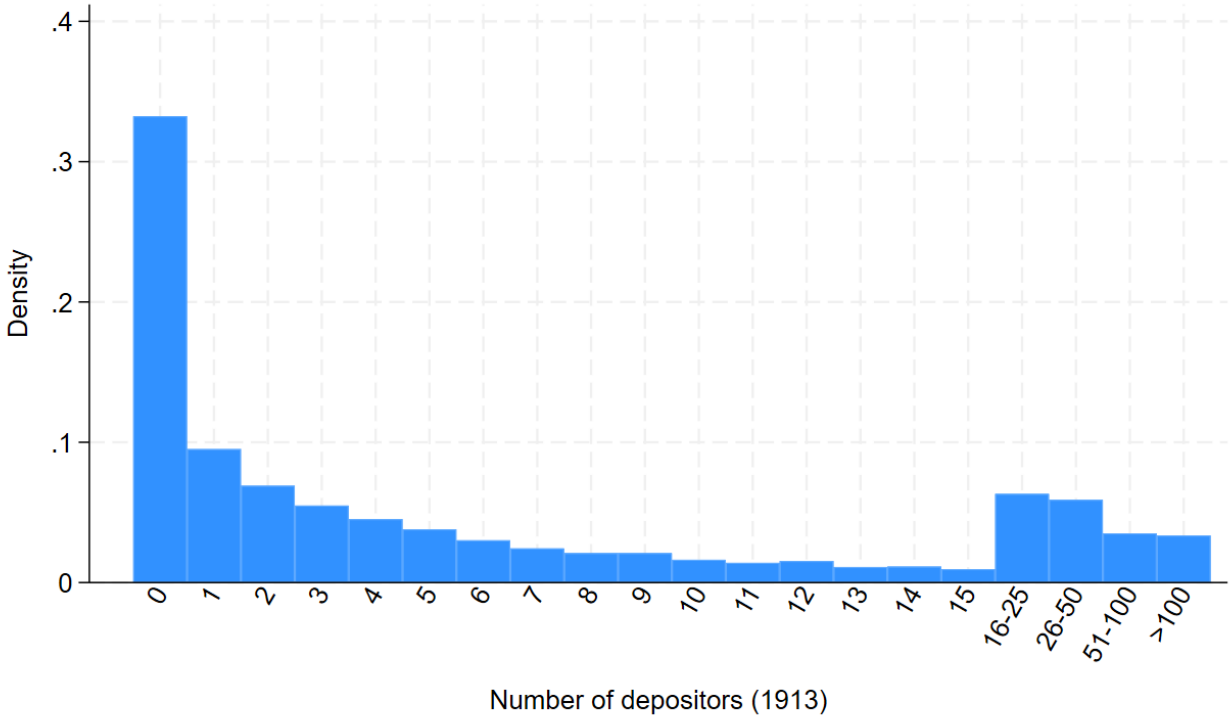
Notes: The figure provides the total number of post offices that accepted deposits in a given year and the value of all deposits in the system.

Figure A2: Effect of Other Postal Savings Years on Bank Closure during Great Depression



Note: Figure shows the point estimates and 95% confidence intervals of the coefficient on different years of local postal savings availability (described on the y-axis) predicting commercial bank closure 1929-1935 in regressions similar to equation (2).

Figure A3: Distribution of Postal Savings Depositories by Depositors in 1913



Note: Figure shows the distribution of postal savings depositories based on the number of total depositors in the 1913 *Annual Report on the Operation of the Postal Savings System*.