# Deposit Insurance, Deposit Competition, and Bank Instability

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*Abstract:* The lack of universal deposit insurance coverage can lead to additional financial instability during crises when 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 deposit accounts at only some post offices, played in the Great Depression. Using an IV that identifies exogenous variation in postal saving availability, we find that commercial banks were more likely to close when a nearby post office accepted deposits, suggesting that more depositors withdrew funds in locations with deposit insurance than without it. To survive the competition, banks needed more reserves than in other locations. The negative effect disappears once commercial banks were insured by the FDIC.

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> 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veritable avalanche of funds came out of other banks, it was the Postal Savings System that salvaged much of the money withdrawn by the frightened and the timid.
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> -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 insured banks. Therefore, we study a historical environment that allows a comparison of markets with and without deposit insurance in the same country and period.

Before the Federal Deposit Insurance Corporation (FDIC) became active in 1934, 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 postal savings. We find that the availability of the federally insured deposit option led to more bank instability than otherwise identical locations without any insurance during the early 1930s. Indeed, banks needed more liquidity to survive in locations where postal savings was available.

Deposit insurance spread throughout the world in the latter half of the 20$^{th}$ 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 has shown that insured banks expand their risk and increase the probability of a financial crisis.[2] Aside from moral hazard, the events of March 2023 suggest that the lack of universal coverage might decrease bank stability during a crisis by encouraging customers to move uninsured deposits. 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 instability than would have occurred without any insurance. During the Great Depression, post offices operated beside commercial banks in towns throughout the country, but not every post office accepted deposits. Since branching was largely prohibited, we can compare bank outcomes in very similar markets (e.g., same bank regulations, macroeconomic conditions, legal system, and monetary base) that vary due to the availability of deposit insurance. As uncertainty about bank health rose during the 1930s, concerned depositors withdrew money from their banks to keep safe at home. However, a federal insurance option in their town may have motivated more depositors to withdraw funds than otherwise would have.

The historical period has several additional features that make it a near-ideal environment to identify the effect of limited deposit insurance. Post offices were narrow banks that did not make loans with the deposits they collected (e.g., Pennacchi 2012). As such, the existence of postal savings did not lead to additional risk-taking or moral hazard. Moreover, by construction, post offices attracted few deposits before 1929, and served those marginalized individuals that

[2] See Brewer (1995), Caprio and Klingebiel (1996), 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), and Calomiris and Chen (2023).

commercial banks did not want to pursue. The availability of postal savings thus did not affect the behavior of commercial banks before the Depression.

To examine the role that postal savings played on bank stability, we collect the balance sheets of over 16,000 commercial banks just before the start of the Great Depression and match them with information on postal saving. We avoid the endogenous response to the Depression by measuring postal savings availability in 1928 rather than the contemporaneous value of postal deposits. We then examine whether banks in places with postal savings in 1928 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 Great Depression.

We find banks that operated nearby 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. The effect of postal savings is eliminated after deposit insurance was installed across commercial banks and federal liquidity support was expanded. Therefore, once commercial banks were insured, the postal savings system no longer attracted their depositors. This lends credence to the theory that we are capturing an effect due to the lack of universal coverage rather than some other mechanism.

Supporting many contemporary accounts, we show that depositors seem to be moving funds from their bank to the postal system. Specifically, the value of deposits in post offices increased most in those areas with banks, and even controlling for the number of banks in a town, the value rose most near closing banks compared to those at other post offices. Indeed, the strong growth of postal savings over the period is unlikely to have been fully driven by money outside the formal banking system because few households had much savings outside of banks.

Congress tried to prevent this competition by redepositing postal savings into commercial banks in exchange for a commensurate amount of government bonds and a fixed rate of interest. However, while this might have prevented some postal savings from "leaving" the banking system, relatively few banks outside financial centers received the funds and the bond security requirements prevented banks from using the postal funds as reserves. As such, a dollar of individual deposits contributed more to bank stability than a dollar of postal savings redeposits. The results are not sensitive to controlling for banks that were more likely to receive 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 permanently stopped thousands of offices from accepting them during World War I (WWI). We find that post offices that initially accepted deposits 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. The IV analysis confirms that commercial banks that operated in the same town as postal savings were more likely to close by 1935.

The 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 indicates that there is not a location-specific unobserved characteristic driving both bank closures and postal savings.

Our analysis complements the existing 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 option of an insured account instead of a mattress, more depositors seemingly 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 potentially 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; Shoven et al. 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. A federally-insured deposit option during the 1930s allowed investors to shift their funds from banks into a safe asset and led to additional closures compared to areas without the option.

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. Our results show that lawmakers need to take into consideration the effect that postal banking may have on private markets. In fact, the same competition could occur with any government guaranteed asset such as central bank digital currency.

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. John A. Creswell, the Postmaster General under President Ulysses S. Grant, emphasized the safety of postal deposits and how it was a solution to the problem of savers hiding their money rather than depositing it in banks (Post Office Department 1873). In 1878, Rep. Thomas J. Tipton (R-IL) articulated the need for safety: "(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 got the bill passed.

The nation's banking sector was the main opponent of postal savings legislation. Bankers argued the Post Office would siphon money out of communities. A 1907 criticism of U.K. postal savings quoted the *London Banker's Magazine*: "The branches of the Post-Office Savings-Bank convey all the savings of the district which they receive straight up to the central office in London... it is thus removed from the district in which it originates" (Roberts 1907). The American Banking Association (ABA) argued that postal savings would compete with existing banks, going so far as to distribute a nation-wide letter to bankers with the following passage:

> 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).

Many of 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 would have 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, as constructed, most initial postal savings depositors were relatively poor and 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 1934.

While postal savings continued to see limited aggregate use in the 1920s, there were local spikes in usage linked to local banking panics. Contemporary accounts (e.g., *The St. Louis Star and Times* 1924) attributed increased postal saving usage in some areas to a desire for security following their bank's troubles in the early 1920s. For example, real postal deposits in Florida grew by 600% during the collapse of the state's real estate bubble in 1925-6 (Calomiris and Jaremski 2023), and the collapse 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). The 1929 Stock Market Crash and commercial bank runs in 1930 coincided with a large rise in postal deposits. 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). Growth in postal deposits then plateaued once the FDIC became active in 1934. 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.

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? The ability for depositors to quickly move their funds from a local bank to a local post office presented a substantial risk. 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. During a 1932 Milwaukee banking crisis, the local post office had to open additional windows to meet depositor demand and over $100,000 was deposited on July 19 alone ("Postal Savings Mount" *Milwaukee Journal* July 20, 1932). The *Wall Street Journal* also highlighted the flood of postal deposits in Helena, Arkansas when its two banks began to fail in 1931 (cited in Shaw 2018). It is thus clear that contemporary observers believed that commercial

bank deposits were flowing into postal savings banks. Therefore, individuals seemed happy with the higher interest rates of commercial banks during good times but shifted funds to the guaranteed lower interest rate of postal savings during periods of financial stress.

City-level postal savings information illustrates this competition between institutions. The top panel of Figure 1 shows postal savings rose across all locations during the Depression, but rose significantly higher in locations with more banks. Given that individuals held little liquid savings outside of banks, it is unlikely that these differences could arise from money returning from outside the system. If the local availability of postal savings encouraged depositors to move their funds from commercial banks, then deposits in postal offices should rise faster in locations with bank instability than in other locations. We show this in the bottom panel of Figure 1 by looking at postal savings locations with only one bank and then graph out the average amount of postal deposits relative to the year the bank closed (or 1929 if no bank closed).[3] Even within this similar city group, the data show that postal savings grew significantly faster in areas with a closed bank. The differential growth typically started in the year of a bank's closure and grew even larger the year after. This suggests that deposits were moving from commercial banks to post offices in the way suggested by the contemporary accounts.

The relative success of postal savings and failure of commercial banks led to calls for the expansion of postal saving. The ABA and commercial banks began to issue harsh statements and lobby against postal savings in the 1930s (Shaw 2018). One New York banker in 1933 expressed the general sentiment of commercial banks: "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).

[3] Postal data are provided in June of each year and therefore we match bank closures to that reporting window.

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 in banks but only 3,879 of the over 25,000 commercial banks received any. 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 local banks throughout the country. As the Depression wore on, the requirements for postal deposits became too dear and banks began refusing redeposits.

The rest of this paper utilizes bank-level data to test whether the availability of a local federally insured option led to a higher probability of a commercial bank closing. Because postal savings had no regulatory power over banks, the only way that it could influence bank stability was through the attraction of depositors. We thus are testing whether depositors were more likely to withdraw funds from banks in locations with postal savings than banks in other locations.

## 2. Data

Bank-level 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.[4] Several states did not report individual bank balance sheets during the period, and must be excluded from the analysis. Nevertheless, the data span the

[4] 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.

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 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 in order to fully capture closures. Any bank not in the list is denoted as remaining open through 1935.

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. Our primary year of interest is postal savings in 1928 in order to avoid endogenous changes during the Great Depression. The post office only reported names of post offices that had at least 1 depositor in their 1928 report. This means that post offices that accepted postal savings but had no depositors at the end of 1928 fiscal year were not included in the 1928 annual report. Fortunately, the 1927 and 1929 reports list all postal repositories, even if they had no depositors. We, therefore, imputed whether a post office had postal savings in 1928 for places with missing data using whether a post office reported having a depository in 1927 or 1929 with 0 depositors. This approach yields a total number of postal depositories very close to that reported by the Post Office in 1928. The results are not sensitive to picking other years in which to examine the availability of postal savings.

Figure 2 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). There is also variation in postal savings availability. 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. Effect of Postal Savings on 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 show that the results are likely driven by depositors moving their funds out of commercial banks and into postal savings.

### *3.1 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. To avoid an endogenous reaction to the commercial bank troubles during Depression, our primary measure of postal savings is whether a town had a post office that accepted deposits in 1928. Almost all postal saving depositories were 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 of deposits. The availability of postal savings in a location rather than its deposits also 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.[5] The measure thus captures the withdrawal mechanism we seek to observe and treats all postal savings locations the same regardless of whether they had $1 on deposit or $1 million.

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[6]: 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). 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 the measures regulators used to determine the health of bank balance sheets 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.

During this period, banking was decidedly local and homogeneous outside of financial centers. Branching was largely prohibited and most locations had only one or two banks. Moreover, very few depositors had access to banks or other financial assets in other cities. Most

[5] The results when using contemporaneous postal deposits or depositors are shown in Tables A1 or A3.
[6] During the period, information on income statements and loan loss provisions were not publically available. However, the bank-balance-sheet measures which we analyze were highly correlated with bank performance.

banks thus served the community immediately around their location and there was relatively little diversity in the type of business they conducted. In this way, the balance sheet of a bank was highly correlated with its performance.

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.[7]

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.

We use OLS to estimate the probability that a bank present in 1928 closed by 1935:[8]

$$Closure_i = a + \beta_1 Postal_i + \beta_2 BalSheet_i + \beta_3 X_i + \beta_4 State_i + e_i \quad (1)$$

where $Closure_i$ is an indicator for whether bank *i* had closed between 1929 and 1935, $Postal_i$ 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.

[7] 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.
[8] We estimate a linear probability model to be consistent with the instrumental variable regressions in the next section. Logit and probit models provide similar results as the OLS.

$State_i$ is a vector of state indicator variables, and $e_i$ is Huber-White robust standard errors clustered at the state level.

Column 1 of Table 1 provides the effects estimated of equation (1) for the full sample of banks. Having a local post office 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 3.2 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 deposit insurance option caused more depositor withdrawals then in locations without insurance.

We next test whether the results are sensitive to different samples and variables. First, we examine whether banks in the most and least populated locations are driving the results. While post offices were present in every bank location, postal savings required some population level to operate. Every large city had one, and few rural areas did. We drop locations with either 1$^{st}$ or 4$^{th}$-class post offices (i.e., the largest cities and smallest towns) in column 2 of Table 1. The results remain economically and statistically significant.

Second, 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 biased upward. We, therefore, control for the fraction of all other commercial banks in the county that closed during the period. Based on the descriptions of Friedman and Schwartz (1963) and Wicker (1996), the county-level closure rate along with the state-fixed effects should 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 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.

Third, we examine whether the effect of postal savings is primarily in places where it was popular prior to the Depression. Commercial banks in the few areas where postal savings attracted a large number of depositors might have shifted their portfolios to compete. We, therefore, drop out any post office that had more than $1 per person in the county on deposit in 1928 in column 4 of Table 1. The approach drops only 7.4% of banks emphasizing how little postal savings was used before 1929. Nevertheless, we find similar results to those in column 1.

Fourth, we examine whether the results are sensitive to dropping southern states. Specifically, these states were historically poorer and less integrated into formal financial institutions. Bank runs might have been more likely and postal savings banks might have been more prominent in these locations. While state-fixed effects help account for these areas, the results remain when dropping them completely in column 5 of Table 1.

Finally, we examine whether postal redeposits might be affecting our results. As discussed in the background section, most of postal savings were to be redeposited in commercial banks, but relatively few banks received them. The low number and concentration of redepositories in larger cities was driven by the higher requirements of redeposits. 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 and received redeposits in the 1910s but did not provide any additional collateral over the period we observe. The list thus captures those banks that were actively receiving redeposits leading up to and during the Great Depression.

Column 6 of Table 1 shows the results when we control for these observed redeposit banks. We continue to find that the availability of postal saving led to a higher probability of a local commercial bank closing. The coefficient on receiving postal redeposits is positive but not statistically significant, suggesting that redeposits did not necessarily save banks from closure.

We also examine whether the effect of the availability of postal savings varies over time. The FDIC was created by the Glass-Steagall Act in July 1933 (and its insurance became active in January 1934) which might have weakened the attraction of postal savings. Additional liquidity and capital provisions were also introduced to help commercial banks in 1933 and 1934. In Figure 3, we provide the postal savings coefficients when equation (1) is estimated for each individual closure year (after dropping previous closures) where years are defined as July-June to match postal savings reporting. As expected, the effect of postal savings declines in the period July 1932 through June 1933 and is completely eliminated after. The evidence suggests that the effect of postal savings was through its federal guarantee as the introduction of the FDIC and other liquidity provisions decreased the risk posed by the system.

We also rule out that the results are due to our choice of postal savings year. A few post offices stopped taking deposits during the 1920s and some new ones started taking them during the Great Depression. We, therefore, re-estimate equation (1) using the local availability of postal savings in other years and report the coefficients for those other measures in Figure 4. Postal saving availability in any year after 1917 is positively and significantly related to commercial bank closures. The lack of an effect before 1918 is expected given that many postal offices were ordered to stop taking deposits during WWI and did not restart before the Depression (See Appendix Figure A1).

*3.2 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. Nearly every 1st, 2nd, or 3rd class post office rushed to start receiving deposits, with the number of depositories peaking at 12,820 in 1913. The Postmaster General ordered 7,414 post offices to stop taking deposits during WWI and very few post offices began taking deposits in the 1920s.[9]

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 4th class postal depositories were closed in 1914. Conversely, nearly all 1st class postal depositories were kept open. The decisions for 2nd and 3rd class postal depositories appear to be determined by depositors in those first few years. Specifically, of depositories in 2nd and 3rd class post offices where we observe exactly 1 depositor at the 1913/1914 year-end snapshots, less than 3.2% of them closed by 1915 compared to 56% of those where we do not observe any depositors. The Post Office followed a similar pattern in the following year. The elimination of postal savings with zero depositors was virtually complete. By 1916, only 34 2nd or 3rd class post offices had depositories with no depositors, yet 975 depositories with 1 depositor were still in operation. This division is astonishing as most of the single depositors held less than $5 on deposit and reflects the very low operating costs of the system.

As seen in Figure 5, only 7.34% of 0-depositor places still had postal savings, while 22.76% of 1-depositor places did. This means that 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

[9] Reported in Appendix Table A2, 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.

later. We, therefore, focus on the sample of banks in locations that had 2nd or 3rd class post offices with postal savings with either 0 or 1 depositors in 1913/1914 or 1914/1915 (see geographic distribution in Figure 6), and use the presence of having only one depositor as an instrument for postal savings availability in 1928. 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.

Table 2 displays summary statistics for the IV sample, comparing towns with 0 depositors with those with exactly 1 depositor during 1913-1915. As expected, towns with 1 depositor in the 1910s were much more likely to keep receiving postal deposits through 1928. However, in stark contrast to the full sample information (see Table A4 in the Appendix), we observe no systematic differences in the two groups of towns. Aside from the existence of postal savings, the only other location variable for which the two groups of locations are significantly different at the 1% level is the fraction of the population that was non-white. This difference is fully explained by state-level variation that we control for in the regressions.

Comparing banks in the two locations, we find the banks in one-depositor towns have significantly more assets and a smaller share of loans. As seen in Table 1, banks with larger assets and fewer loans are less likely to close, suggesting that our instrument is slightly pushing away from any finding that postal savings causes bank failure, as the underlying characteristics

of banks in towns with postal savings makes them slightly less likely to close. Using the estimates from column 1 of Table 1 to predict the overall probability of closure, the balance sheets in the average bank in 1-depositor towns make them 0.52 percentage points less likely to close than the average bank in 0-depositor towns.

Using banks in locations that had a 2nd or 3rd class post office that accepted deposits but had 0 or 1 depositors in 1913-15, our IV specification, estimated via 2SLS, is as follows:

$$Closure_i = a + \beta_1 BalSheet_i + \beta_2 \widehat{Postal}_i + \beta_3 X_i + \beta_4 State_i + e_i \quad (2A)$$

$$Postal_i = a + \pi Depositors_i + \xi BalSheet_i + \xi X_i + u_i \quad (2B)$$

where the second-stage regression in equation (2A) is essentially the same as equation (1) 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; $\widehat{Postal}_i$ is now a predicted value, based on the results of the first-stage regression. In the first-stage regression in equation (2B), the indicator for having an active postal savings bank in 1928 is regressed on an indicator for whether the postal bank had 1 depositor in 1913-1915 as well as the same controls as in the second stage.

The first stage result of equation (2B) is 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 1928. Places with 1 depositor in 1913-1915 were 10 percentage points percent more likely to have an open postal savings bank in 1928. The first-stage is quite strong with a Cragg-Donald Wald F statistic of 50.46, well above the Stock-Yogo weak IV critical value (16.38).

The second stage result of equation (2A) in the top panel of Table 3 confirms the findings in Table 1. Postal savings availability remains associated with a higher probability of bank closure during the Great Depression. Again, it is important to point out that we are measuring

postal savings with whether individuals could make deposits at the local post office in 1928 rather than the value of postal deposits over time or including new post offices. The instrument then isolates exogeneous variation in that postal deposit availability.

The second column 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. The results show that banks in places with exactly 1 depositor were more likely to close during the Depression.

The IV estimates are larger than the OLS estimates for three reasons. First, places that had postal savings in 1928 likely have more demand for banking services in general and therefore were less likely to close. This would bias our OLS estimates towards zero compared to the IV. Second, there are significant differences between the OLS and IV. While many towns only had 0 or 1 depositors, these towns were small (the average population was 1,196 in the IV sample, and 10,144 for all towns). The banks in these towns were also smaller (the average assets was $631,404 in the IV sample, and $3,440,482 for all banks) which means the average rise in postal savings (from $354 in 1928 to $46,560 in 1934) would have had a larger effect in the IV sample than full sample. Third, very few banks in the IV sample would have received postal redeposits. For instance, the number of banks depositing collateral bonds at the Post Office was much smaller (2.43% in the IV sample compared to 10.01% for all banks). These factors mean that this subset 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. The IV analysis helps avoid any unobserved location heterogeneity and isolate a causal effect of postal savings on commercial bank closures.

*3.4 Mechanism – Liquidity Risk*

The previous empirical analysis has shown that the availability of local postal savings is associated with a higher probability of closure for surrounding commercial banks. Based on contemporary accounts and data on postal deposits in the background section, we have interpreted this as depositors removing their funds from commercial banks in larger numbers in areas with postal savings than without it. This section tests this assertion. If our results are driven by this mechanism, then a bank's level of liquidity should have been even more important for banks located near postal savings than for other banks. We, therefore, expand the analysis by adding an interaction between the postal savings indicator and each bank's reserves in 1928 to equation (1). The model is:

$$Closure_i = a + \beta_1 Postal_i + \beta_2 Postal_i X Reserves_i + \beta_3 BalSheet_i + \beta_4 X_i + \beta_5 State_i + e_i \quad (3)$$

where $Reserves_i$ is the level of the bank $i$'s reserves (i.e., 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 the separate controls for $Reserves_i$ and $Postal_i$ capture the effects of liquidity and postal savings respectively.

Table 4 reports the estimates of equation (3). Compared to Table 1, the larger coefficient on the postal savings indicator 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

indicates 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 25$^{th}$ percentile of reserves (0.118) to the 75$^{th}$ 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, the interaction term shows that a bank needed even more liquidity to survive when it was near a post office that accepted deposits. The evidence suggests that depositor withdrawals were driving the closures associated with postal savings.

We also test for a similar liquidity effect within our IV framework. Specifically, we estimate 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. In this way, being located near a postal savings bank was primarily affecting those banks with low reserves.

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 should not have affected local businesses or competed with banks to make loans, and as such should not have been 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 1 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 and column 3 of Table 5. 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. 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 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.

## 4. Conclusion

The lack of universal deposit insurance can affect depositor behavior during crises, shifting funds away from uninsured accounts towards insured ones. 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 could not easily put them into insured accounts. 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 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 depositories. Specifically, 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. In this way, we are confident that the measured effect is not some unobserved factor associated with both bank closure and postal savings, but rather is an effect of depositors responding to the availability of a federally insured alternative.

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 detract 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. In fact, the same competition could occur with any government guaranteed asset such as central bank digital currency.

## References


Barth, James R., Gerard Caprio, and Ross Levine (2006). *Rethinking Bank Supervision and Regulation: Until Angels Govern* (Cambridge University Press, Cambridge).

Beck, Thorsten, and Luc Laeven (2008). "Deposit insurance and bank failure resolution: Cross country evidence", in A, Demirguc-Kunt, E. Kane, and L. Laeven, eds.: *Deposit Insurance Around the World: Issues of Design and Implementation* (MIT Press).

Board of Governors of the Federal Reserve System. (1959). *All-Bank Statistics, United States, 1896-1955*.

Boyd, John H., and Gianni De Nicolo. (2005). "The theory of bank risk taking and competition revisited." *Journal of Finance* 60: 1329-1343.

Brewer III, E. (1995). "The impact of deposit insurance on S&L shareholders' risk/return trade-offs." *Journal of Financial Services Research* 9(1): 65-89.

Caglio, Cecilia, Jennifer Dlugosz, and Marcelo Rezende. (2024). "Flight to Safety in the Regional Bank Stress of 2023." SSRN Working Paper 4457140.

Calomiris, Charles W., and Sophia Chen. (2022). "The spread of deposit insurance and the global rise in bank asset risk since the 1970s." *Journal of Financial Intermediation* 49.

Calomiris, Charles W., and Matthew Jaremski (2016). Deposit Insurance: Theories and Facts, *Annual Review of Financial Economics* 8: 97-120.

Calomiris, Charles W., and Matthew Jaremski (2019). "Stealing deposits: Deposit insurance, risk-taking, and the removal of market discipline in early 20th-century banks." *The Journal of Finance* 74: 711-754.

Calomiris, Charles W., and Matthew Jaremski. "Florida (un) chained." *Journal of Financial Intermediation* 55 (2023): 101043.

Calomiris, Charles W., Jaremski, Matthew, and David C. Wheelock. (2022). "Interbank Connections, Contagion and Bank Distress in the Great Depression." *Journal of Financial Intermediation* 51.

Caprio, G, and Daniela Klingebiel. (1996). "Bank insolvencies: Cross-country experience." World Bank Policy Research Paper 1620.

Chang, B., Cheng, I.-H., and Hong, H. G. (2023). The fundamental role of uninsured depositors in the regional banking crisis. Available at SSRN 4497863.

Cull, Robert, Lemma W. Senbet, and Marco Sorge, 2005, Deposit insurance and financial development, *Journal of Money, Credit and Banking* 37: 43-82.

Davison, Lee, and Carlos D. Ramirez. (2017). "Does deposit insurance promote financial depth? Evidence from the Postal Savings System during the 1920s." *FDIC Center for Financial Research Paper No. CFR WP* 2.

Demirgüç-Kunt, A. and Detragiache, E. (2002). "Does Deposit Insurance Increase Banking System Stability? An Empirical Investigation." *Journal of Monetary Economics* 49: 1373-1406.

Demirgüç-Kunt, Asli, and Harry Huizinga, (2004). "Market discipline and deposit insurance." *Journal of Monetary Economics* 51, 375-399.

Demirgüç-Kunt, Asli, Edward Kane, and Luc Laeven, (2008). "Determinants of deposit-insurance adoption and design." *Journal of Financial Intermediation* 17: 407-438.

Drechsler, I., Savov, A., Schnabl, P., and Wang, O. (2023). Banking on uninsured deposits. Available at SSRN 4411127.

Egan, Mark, Ali Hortaçsu, and Gregor Matvos. (2017). "Deposit competition and financial fragility: Evidence from the us banking sector." *American Economic Review* 107: 169-216.

Fishback, P., Troesken, W., Kollmann, T., Haines, M., Rhode, P., and Thomasson, M. (2011) "Information and the Impact of Climate and Weather on Mortality Rates During the Great Depression." *Economics of Climate Change: Adaptations Past and Present*. Ed. by G. Libecap and R. Steckel. Chicago: University of Chicago Press, 131-168.

Fleitas, Sebastian, Matthew Jaremski, and Steven Sprick Schuster. (2023) "The US Postal Savings System and the collapse of building and loan associations during the Great Depression." *Southern Economic Journal* 89: 1196-1215.

Friedman, Milton, and Anna J. Schwartz (1963). *A Monetary History of the United States, 1867-1960*. Princeton: Princeton University Press.

Gertler, M., and Gilchrist, S. (2018). "What happened: Financial factors in the great recession." *Journal of Economic Perspectives* 32(3): 3-30.

Goldstein, Itay, and Ady Pauzner. (2005). "Demand–deposit contracts and the probability of bank runs." *Journal of Finance* 60: 1293-1327.

Haines, Michael R. (2008). *Historical, Demographic, Economic, and Social Data: The United States Inter-university Consortium for Political and Social Research*, pp. 1790-2000. Ann Arbor, MI. ICPSR Study 2896.

Hellmann, Thomas F., Kevin C. Murdock, and Joseph E. Stiglitz. (2000). "Liberalization, moral hazard in banking, and prudential regulation: Are capital requirements enough?." *American economic review* 91: 147-165.

Jaremski, Matthew, and David C. Wheelock. (2020). "Banking on the boom, tripped by the bust: Banks and the World War I agricultural price shock." *Journal of Money, Credit and Banking* 52: 1719-1754.

Jaremski, Matthew, and David C. Wheelock. (2023). "Interbank Networks and the Interregional Transmission of Financial Crises: Evidence from the Panic of 1907". Working paper.

Jiang, Erica Xuewei, Gregor Matvos, Tomasz Piskorski, and Amit Seru. "Monetary tightening and US bank fragility in 2023: Mark-to-market losses and uninsured depositor runs?." *Journal of Financial Economics* 159 (2024): 103899.

Kemmerer, E. (1917). "Six Years of Postal Savings in the United States". *American Economic Review*, 7(1): 46-90.

Kim, Edward T. and Kundu, Shohini and Purnanandam, Amiyatosh. (2024). *The Economics of Market-Based Deposit Insurance*. Available at SSRN 4813996.

Laeven, Luc, and Fabian Valencia (2013). "Systemic banking crises database", *IMF Economic Review* 61, 225-270.

Martin, Christopher, Manju Puri, and Alexander Ufier. (2024). "Deposit inflows and outflows in failing banks: The role of deposit insurance". Forthcoming *Journal of Finance.*

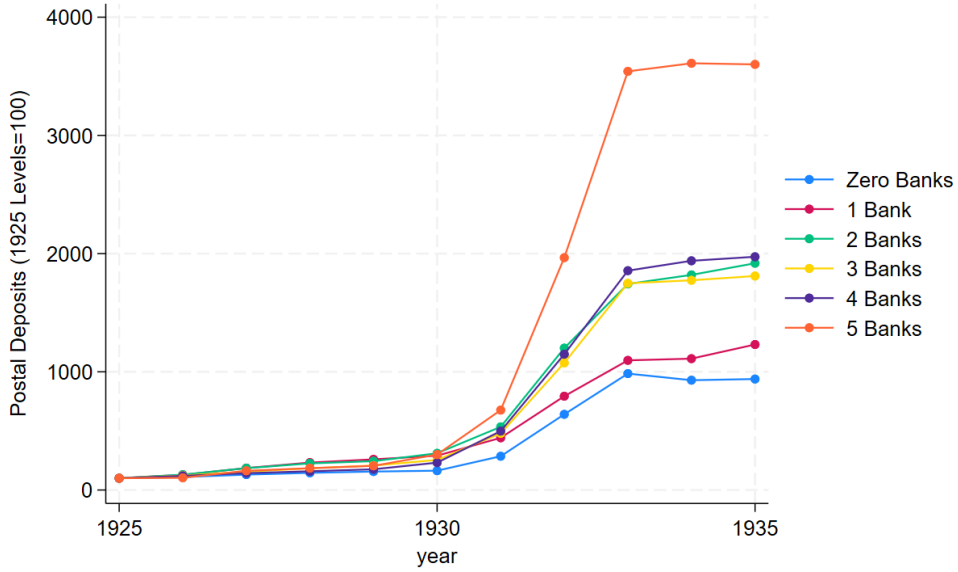
Martinez-Peria, Maria Soledad, and Sergio L. Schmukler. (2001). "Do depositors punish banks for bad behavior? Market discipline, deposit insurance, and banking crises." *Journal of Finance*. 56(3): 1029-1051.

Mitchener, Kris James, and Matthew Jaremski. (2015). "The evolution of bank supervisory institutions: Evidence from American states." *Journal of Economic History* 75: 819-859.

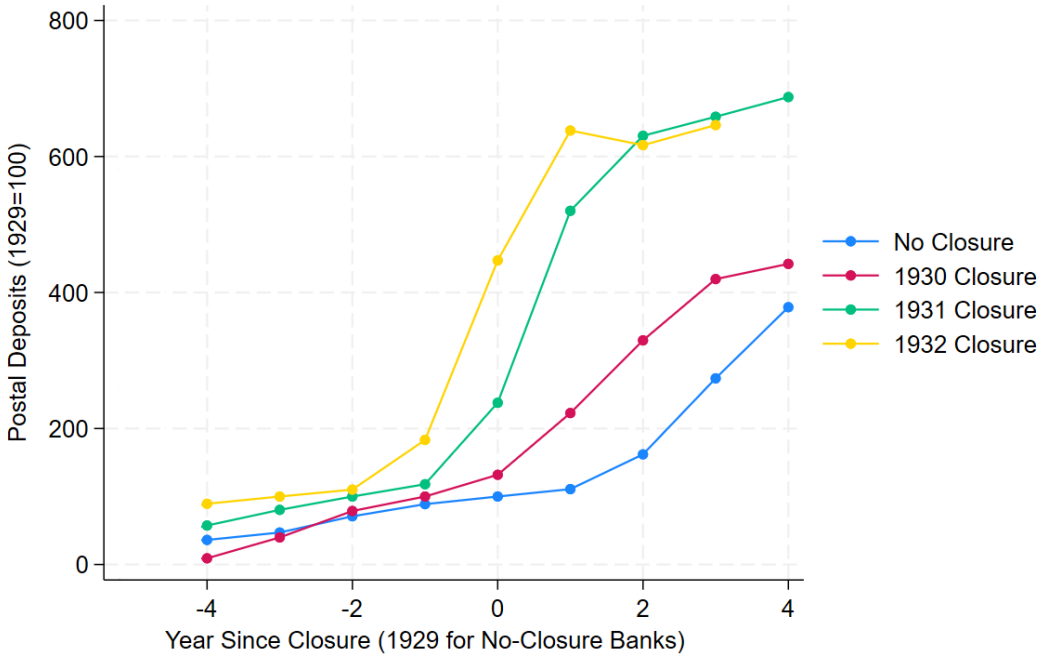
Moen, J., and Tallman, E. (1992). "The bank panic of 1907: The role of trust companies." *Journal of Economic History* 52(3): 611-630.

O'Hara, M., & Easley, D. (1979). "The Postal Savings System in the Depression." *Journal of Economic History* 39(3): 741-753.
Pennacchi, George. (2006). "Deposit insurance, bank regulation, and financial system risks." *Journal of Monetary Economics* 53: 1-30.
Pennacchi, George. (2012). "Narrow banking." *Annual Review of Financial Economics.* 4: 141-159.
Postal Banking: Delivering for the American People (2022). Retrieved from https://www.gillibrand.senate.gov/wp-content/uploads/imo/media/doc/Postal%20Banking%20Report%20-%20FINAL1.pdf
Richardson, Gary, and William Troost. (2009). "Monetary intervention mitigated banking panics during the great depression: quasi-experimental evidence from a federal reserve district border, 1929–1933." *Journal of Political Economy* 117: 1031-1073.
Roberts, G. E. (1907). "Objections to a Postal Savings-Bank". *North American Review* 184(609): 364-370.
Shaw, Christopher W. (2018). ""Banks of the People": The Life and Death of the US Postal Savings System." *Journal of Social History* 52: 121-152.
Shoven, J., Smart, S. and Waldfogel. J. (1992). "Real interest rates and the savings and loan crisis: The moral hazard premium." *Journal of Economic Perspectives* 6(1): 155-167.
Post Office Department. Annual Report of the Postmaster General. GPO, various issues, Washington, DC.
Post Office Department. Operations of the Postal Savings System. GPO, various issues, Washington, DC.
Schewe, Donald Bruce (1971). "A History of the Postal Savings System in America, 1910-1970". Dissertation. The Ohio State University.
Sprick Schuster, S., Jaremski, M., and Perlman, E. (2020). "An Empirical History of the United States Postal Savings System." *Social Science History*. 44(4): 667 – 696.
Wheelock, David C., and Paul W. Wilson. (1995). "Explaining bank failures: Deposit insurance, regulation, and efficiency." R*eview of Economics and Statistics* 77: 689-700.
White, Eugene N. (1984). "A Reinterpretation of the Banking Crisis of 1930," *Journal of Economic History* 44 (1): 119–38.
Wicker, Elmus (1996). *The Banking Panics of the Great Depression.* Cambridge: Cambridge University Press.

**Figure 1: Value of Postal Deposit Levels**
**Panel A: By Number of Banks in Town**



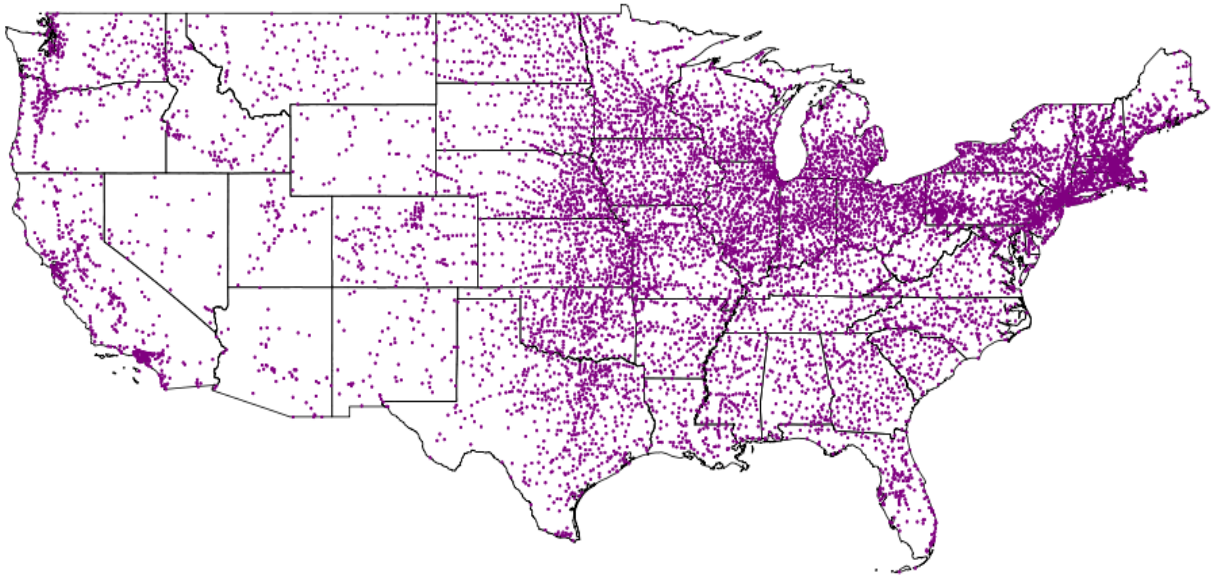

**Panel B: By Date of Closure In One Bank Towns**



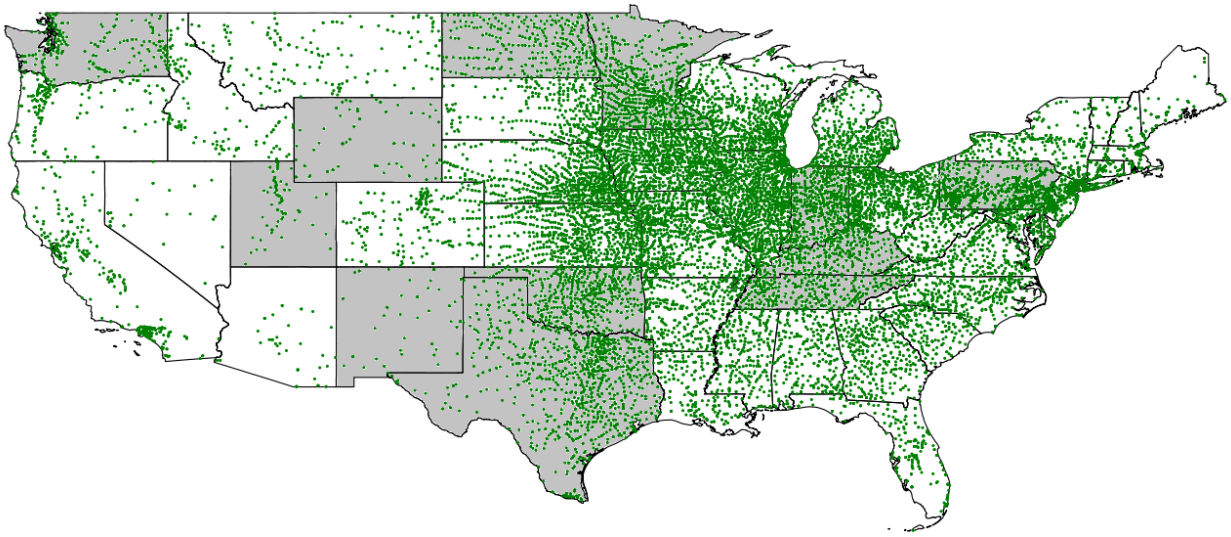

Notes: Panel A shows the relative amount of money on deposit at post office depositories based on the number of banks in the town in 1929. Rates are indexed to 1925 levels of deposits, which is set to a value of 100. Panel B displays the average amount of postal savings deposits (normalized to 100 in 1929) for each of the city types. 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. The panel only contains towns that had exactly one commercial bank in 1928. Data on postal savings deposits comes from 1925 through 1938.

**Figure 2: Location of Postal Savings Depositories and Commercial Banks, 1928**

**Panel A: Postal Savings Depositories**

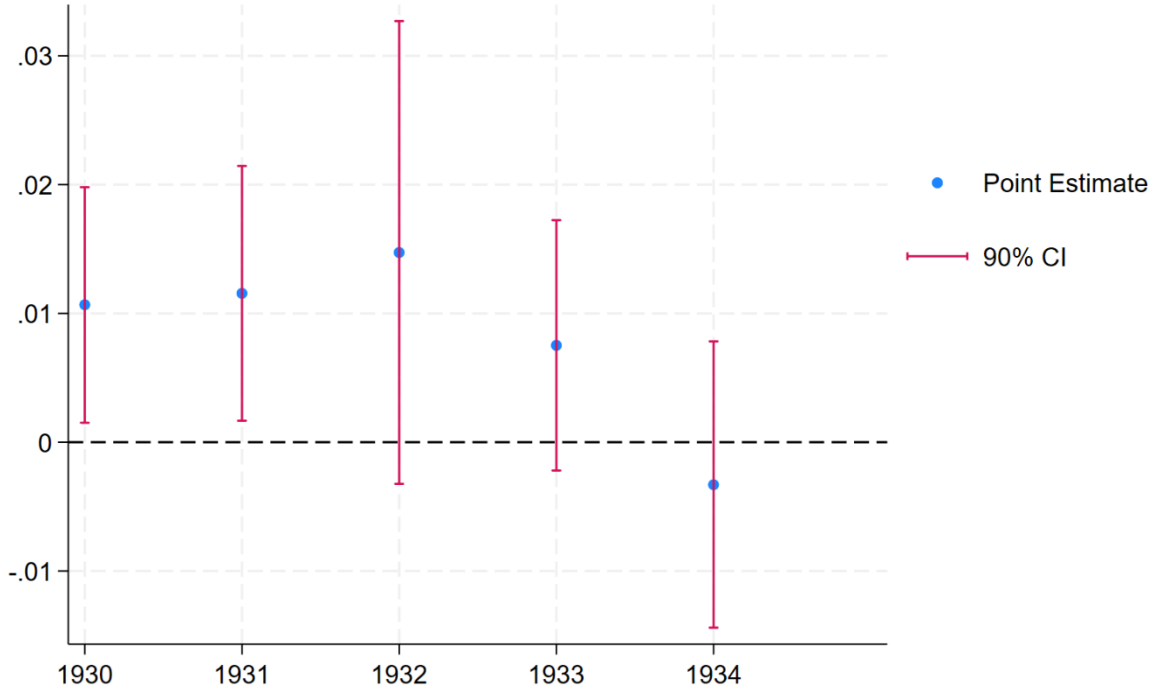


**Panel B: Commercial Banks**



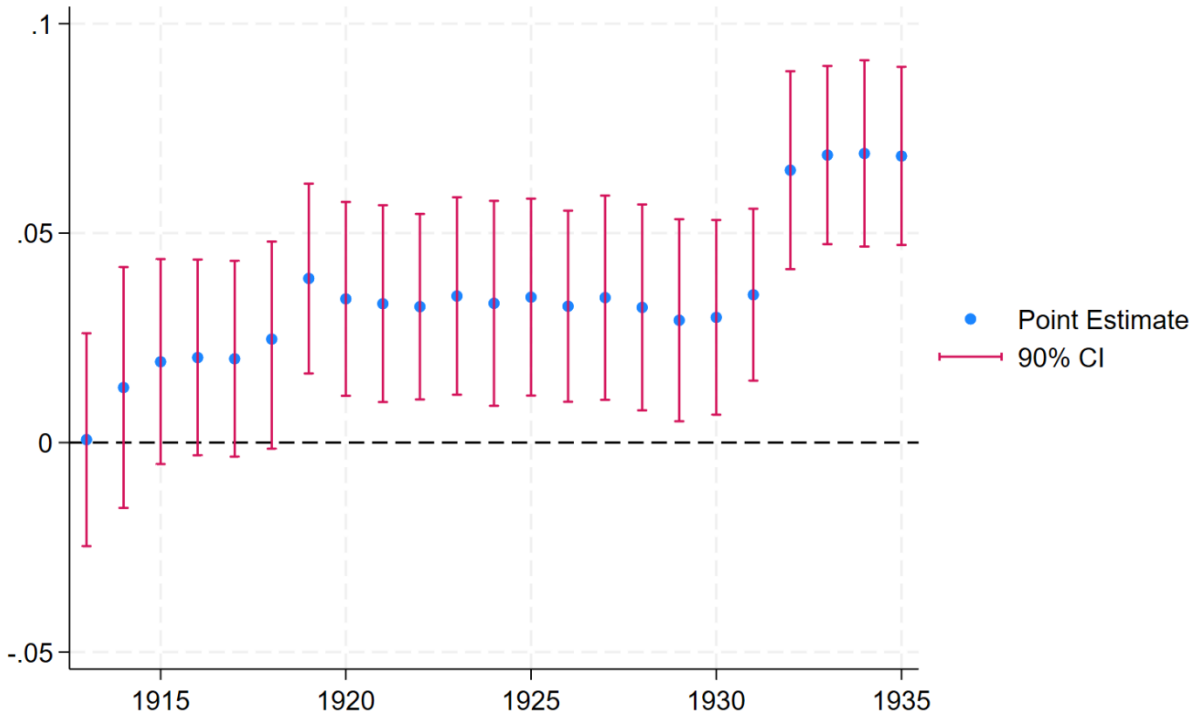
Note: Panel A shows the location of postal savings depositories in operation in 1928. Panel B shows the location of towns with a commercial bank in 1928. The shaded states are those for which we do not have balance sheet data. See Section 3 for the sources of the data.

**Figure 3: Effect of Postal Savings Availability on Bank Closure by Closure Year**



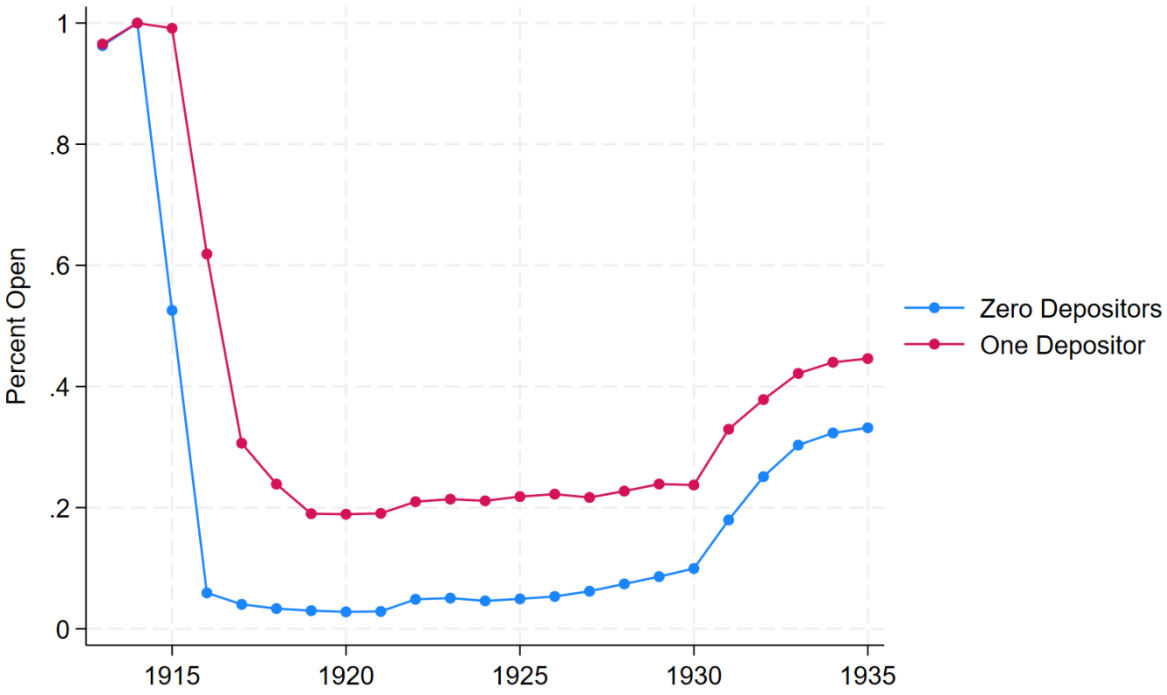

Note: Figure shows the point estimates of the regression described in equation (1), along with the 90% confidence intervals, but estimated for each individual closure year. We drop any bank that had already closed in a previous year. To insure that our measure of bank closures matched that of postal savings, which is measured at the half year, we measure a bank failure 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: Effect of Postal Savings Availability in Other Years on Bank Closure**



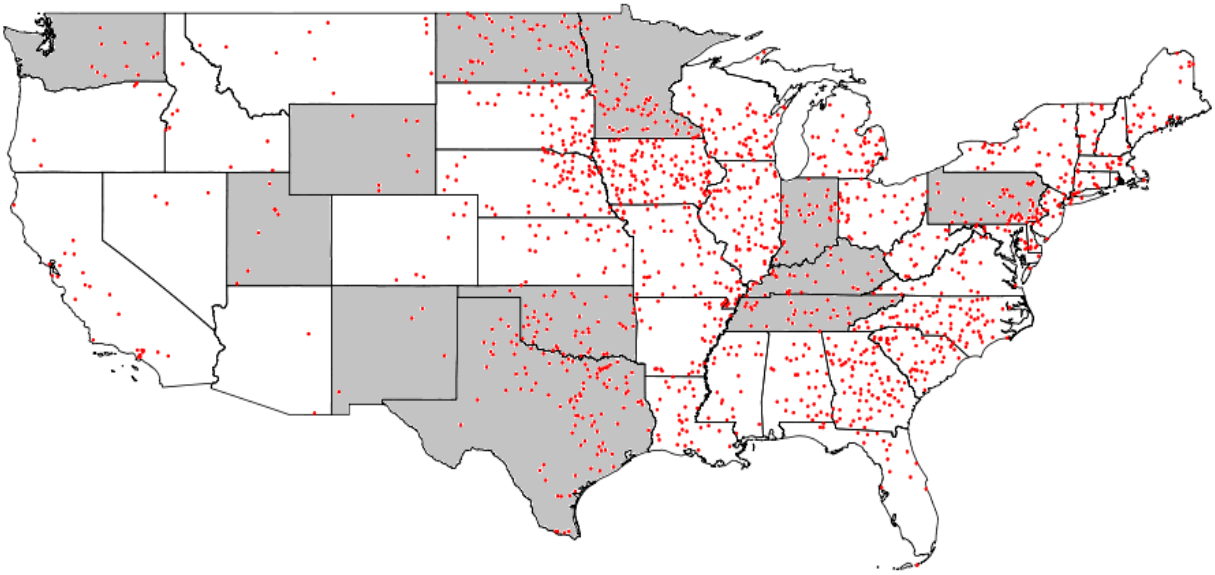

Note: Figure shows the point estimates of the regression described in equation (1) using different years of local postal savings availability, along with the 90% confidence intervals.

**Figure 5: Survival of Initial Postal Savings Depositories (1913-1935)**




Note: Figure shows the percent 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 that time. This graph includes all years when the Post Office reports open depositories with 0 depositors in the data.

**Figure 6: 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.

## Table 1: Effect of Postal Savings Availability on Bank Closure (1929-1935)

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Baseline | Banks in Towns with 2rd or 3rd Class Post Offices | Controlling for Local Panic Intensity | Dropping Large Postal Depositories | Dropping Southern States | Controlling for Redeposits |
| Has Postal Savings (1928) | 0.0323** | 0.0267** | 0.0326** | 0.0357** | 0.0323* | 0.0312** |
| | (0.0145) | (0.0128) | (0.0141) | (0.0137) | (0.0158) | (0.0143) |
| % of Other Banks in County That Closed 1929-1935 | - | - | 0.204*** | - | - | - |
| | | | (0.0334) | | | |
| Postal Depository (=1) | - | - | - | - | - | 0.0124 |
| | | | | | | (0.0136) |
| Ln(Assets) | -0.0450*** | -0.0532*** | -0.0462*** | -0.0435*** | -0.0454*** | -0.0457*** |
| | (0.00847) | (0.0115) | (0.00835) | (0.0097) | (0.0096) | (0.0084) |
| Cash/Deposits | -0.280*** | -0.411*** | -0.278*** | -0.283*** | -0.329*** | -0.280*** |
| | (0.0644) | (0.0963) | (0.0621) | (0.0640) | (0.0024) | (0.0643) |
| Loans/Assets | 0.199*** | 0.239*** | 0.191*** | 0.212*** | 0.173*** | 0.200*** |
| | (0.0401) | (0.0432) | (0.0395) | (0.0449) | (0.0395) | (0.0401) |
| (Profits+Capital)/Assets | -0.173* | -0.431*** | -0.177** | -0.204** | -0.141 | -0.174* |
| | (0.0890) | (0.154) | (0.0855) | (0.091) | (0.101) | (0.0892) |
| Profits/(Profits+Capital) | -0.406*** | -0.374*** | -0.395*** | -0.422*** | -0.404*** | -0.404*** |
| | (0.0369) | (0.0404) | (0.0369) | (0.036) | (0.040) | (0.0369) |
| Observations | 16,755 | 8,415 | 16,593 | 15,511 | 14,571 | 16,755 |
| Location Characteristics | Y | Y | Y | Y | Y | Y |
| State Fed Member Indicator | Y | Y | Y | Y | Y | Y |
| National Bank Indicator | Y | Y | Y | Y | Y | Y |
| State Fixed Effects | Y | Y | Y | Y | Y | Y |
| R-squared | 0.104 | 0.107 | 0.111 | 0.110 | 0.110 | 0.104 |

Note: Results from a linear regression. The outcome variable is an indicator for whether a bank closed, for any reason, from 1929-1935. The sample in Column 1 contains all banks for which we have balance sheet data in towns with 2nd or 3rd class post offices. The sample for Column 2 is all banks with at least 1 other bank in the county. The sample for Column 3 excludes any postal depositories that are holding an amount larger than the population of the county. 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. Standard errors clustered at the state level are provided in parentheses. *** p<0.01, ** p<0.05, *p<0.1

**Table 2: Summary Statistics of Locations in IV Sample**

| | Zero Depositor Locations | One Depositor Locations | Difference |
|---|---|---|---|
| Town-level Variables | | | |
| Number of Banks (1928) | 1.55<br>(0.63) | 1.60<br>(0.67) | 0.05 |
| Percent With Postal Savings (1928) | 7.1<br>(26) | 18.8<br>(39) | 11.7† |
| County-level Variables (in 1929) | | | |
| Log(County Population) | 10.19<br>(0.90) | 10.23<br>(0.93) | 0.04 |
| County Percent Urban (2,500+) | 20.35<br>(23.78) | 21.13<br>(23.46) | 0.79 |
| Farms Per Person | 0.104<br>(0.045) | 0.102<br>(0.044) | -0.002 |
| Manufacturing Facilities Per Person | 0.0012<br>(0.0008) | 0.0012<br>(0.0008) | 0.00 |
| Percent Paying Federal Taxes | 1.40<br>(1.31) | 1.53<br>(1.38) | 0.13 |
| Percent White | 86.03<br>(20.71) | 89.74<br>(17.97) | 3.71† |
| Bank-level Variables (in 1928) | | | |
| Ln(Assets) | 13.03<br>(0.72) | 13.15<br>(0.76) | 0.12† |
| $\frac{Cash}{Deposits}$ | 0.203<br>(0.114) | 0.192<br>(0.107) | -0.011 |
| $\frac{Loans}{Assets}$ | 0.621<br>(0.149) | 0.603<br>(0.151) | -.018† |
| $\frac{Capital + Profits}{Assets}$ | 0.151<br>(0.063) | 0.147<br>(0.064) | -0.005 |
| $\frac{Profits}{Profits + Capital}$ | 0.392<br>(0.201) | 0.392<br>(0.20) | 0.000 |

Note: Table shows the average values for variables of interest between towns with zero depositors and those with 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. Standard deviations are in parentheses below the averages. The third column displays differences, and 2-sided t-tests were performed to determine if the zero and one-depositor groups differed. † $p<0.01$,

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

| | Second Stage (1) | Reduced Form (2) |
|---|---|---|
| Has Postal Savings (1928) | 0.575*** | - |
| | (0.207) | |
| One Depositor in 1913/1915 | - | 0.057*** |
| | | (0.017) |
| Ln(Assets) | -0.0858*** | -0.047** |
| | (0.032) | (0.023) |
| Cash/Deposits | -0.412** | -0.309* |
| | (0.187) | (0.175) |
| Loans/Assets | 0.399*** | 0.398*** |
| | (0.110) | (0.109) |
| (Profits+Capital)/Assets | -0.434 | -0.379 |
| | (0.302) | (0.262) |
| Profits/(Profits+Capital) | -0.361*** | -0.408*** |
| | (0.071) | (0.067) |
| Observations | 2,180 | 2,180 |
| Location Characteristics | Y | Y |
| State Fed Member Indicator | Y | Y |
| National Bank Indicator | Y | Y |
| State Fixed Effects | Y | Y |
| Cragg-Donald Wald F Statistic | 50.46 | - |
| R-Squared (Reduced Form) | - | 0.116 |
| | First Stage | |
| One Depositor in 1913/1915 | 0.100*** | |
| | (0.020) | |
| Observations | 2,180 | |
| Bank Characteristics | Y | |
| Location Characteristics | Y | |
| State Fed Member Indicator | Y | |
| National Bank Indicator | Y | |
| State Fixed Effects | Y | |
| R-Squared (First Stage) | 0.130 | |

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 2. 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). 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) |
|---|---|---|
| | All Banks | All Banks |
| Has Postal Savings (1928) | 0.0620** | 0.0576*** |
| | (0.0241) | (0.0181) |
| Has Postal Savings (1928) X Cash/Deposits | -0.160* | - |
| | (0.0839) | |
| Has Postal Savings (1928) X Closure Probability | - | -0.200*** |
| | | (0.0724) |
| Ln(Assets) | -0.0446*** | -0.0519*** |
| | (0.00838) | (0.00923) |
| Cash/Deposits | -0.219*** | -0.297*** |
| | (0.0657) | (0.0649) |
| Loans/Assets | 0.203*** | 0.217*** |
| | (0.0406) | (0.0851) |
| (Profits+Capital)/Assets | -0.166* | -0.207** |
| | (0.0897) | (0.0851) |
| Profits/(Profits+Capital) | -0.409*** | -0.444*** |
| | (0.0371) | (0.0578) |
| Observations | 16,755 | 16,755 |
| Location Characteristics | Y | Y |
| State Fed Member Indicator | Y | Y |
| National Bank Indicator | Y | Y |
| State Fixed Effects | Y | Y |
| R-squared | 0.104 | 0.147 |

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. Standard errors clustered at the state level are provided in parentheses. *** p<0.01, ** p<0.05, *p<0.1

**Table 5: Instrumental Variables 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 | 0.575*** | 0.766** | 0.338 |
| | (0.207) | (0.347) | (0.225) |
| Ln(Assets) | -0.0858*** | -0.1000*** | -0.0637 |
| | (0.0318) | (0.0318) | (0.0388) |
| Cash/Deposits | -0.412** | -0.529 | -0.113 |
| | (0.187) | (0.465) | (0.194) |
| Loans/Assets | 0.399*** | 0.301 | 0.528*** |
| | (0.110) | (0.192) | (0.141) |
| (Profits+Capital)/Assets | -0.434 | -0.576* | -0.307 |
| | (0.302) | (0.345) | (0.318) |
| Profits/(Profits+Capital) | -0.361*** | -0.371*** | -0.406*** |
| | (0.0713) | (0.107) | (0.0956) |
| Observations | 2,180 | 1,090 | 1,090 |
| 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 | 50.46 | 25.26 | 24.78 |

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. Standard errors clustered at the state level are provided in parentheses. *** p<0.01, ** p<0.05, * p<0.1

**Table A1: Effect of the Level of Postal Savings Deposits on Bank Closure (1929-1935)**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | All Banks | Banks in Postal Savings Towns | All Banks | Banks in Postal Savings Towns |
| Log(Amount on Deposit+1) | 0.00594*** | 0.00698*** | - | - |
| | (0.00192) | (0.00208) | | |
| Log(Number of Depositors +1) | - | - | 0.0164*** | 0.0189*** |
| | | | (0.00491) | (0.00557) |
| Ln(Assets) | -0.0514*** | -0.0456*** | -0.0537*** | -0.0492*** |
| | (0.00827) | (0.00727) | (0.00829) | (0.00764) |
| Cash/Deposits | -0.284*** | -0.328*** | -0.289*** | -0.334*** |
| | (0.0654) | (0.0927) | (0.0657) | (0.0939) |
| Loans/Assets | 0.201*** | 0.178*** | 0.199*** | 0.180*** |
| | (0.0406) | (0.0309) | (0.0409) | (0.0306) |
| (Profits+Capital)/Assets | -0.201** | -0.304** | -0.214** | -0.320** |
| | (0.0883) | (0.123) | (0.0893) | (0.120) |
| Profits/(Profits+Capital) | -0.394*** | -0.391*** | -0.390*** | -0.384*** |
| | (0.0370) | (0.0480) | (0.0373) | (0.0477) |
| 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 | 0.105 | 0.122 | 0.106 | 0.123 |

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 dependent variable for columns 1 and 2 is the log of the amount on deposits (+1) in a town's Postal Savings bank. The primary dependent 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. Standard errors clustered at the state level are provided in parentheses. *** p<0.01, ** p<0.05, *p<0.1

## Table A2: Bank Closure and Alternative Definitions of Postal Savings Availability

| | (1) |
|---|---|
| | All Banks |
| Has Postal Savings (1928) | 0.0263 |
| | (0.0184) |
| Lost Postal Savings (1913-1928) | -0.00935 |
| | (0.0166) |
| Ln(Assets) | -0.0444*** |
| | (0.0088) |
| Cash/Deposits | -0.281*** |
| | (0.00647) |
| Loans/Assets | 0.199*** |
| | (0.0402) |
| (Profits+Capital)/Assets | -0.173* |
| | (0.089) |
| Profits/(Profits+Capital) | -0.406*** |
| | (0.0369) |
| Observations | 16,755 |
| Location Characteristics | Y |
| State Fed Member Indicator | Y |
| National Bank Indicator | Y |
| State Fixed Effects | Y |
| R-Squared | 0.104 |

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. Standard errors clustered at the state level are provided in parentheses. *** p<0.01, ** p<0.05, * p<0.1

**Table A3: Instrumental Variables Regression of the Level of Postal Savings Deposits on Bank Closure (1929-1935)**

| | (1)<br>All Banks | (2)<br>All Banks |
|---|---|---|
| Log(Amount on Deposit+1) | 0.127** | |
| | (0.0587) | |
| Log(Number of Depositors+1) | | 0.406** |
| | | (0.181) |
| Ln(Assets) | -0.108*** | -0.105*** |
| | (0.0377) | (0.0361) |
| Cash/Deposits | -0.543** | -0.592*** |
| | (0.214) | (0.227) |
| Loans/Assets | 0.343*** | 0.325*** |
| | (0.0954) | (0.0935) |
| (Profits+Capital)/Assets | -0.590* | -0.551* |
| | (0.332) | (0.327) |
| Profits/(Profits+Capital) | -0.332*** | -0.316*** |
| | (0.0703) | (0.0711) |
| Observations | 2,180 | 2,180 |
| Location Characteristics | Y | Y |
| State Fixed Effects | Y | Y |
| State Fed Member Indicator | Y | Y |
| National Bank Indicator | Y | Y |
| Cragg-Donald Wald F Statistic | 25.00 | 22.34 |

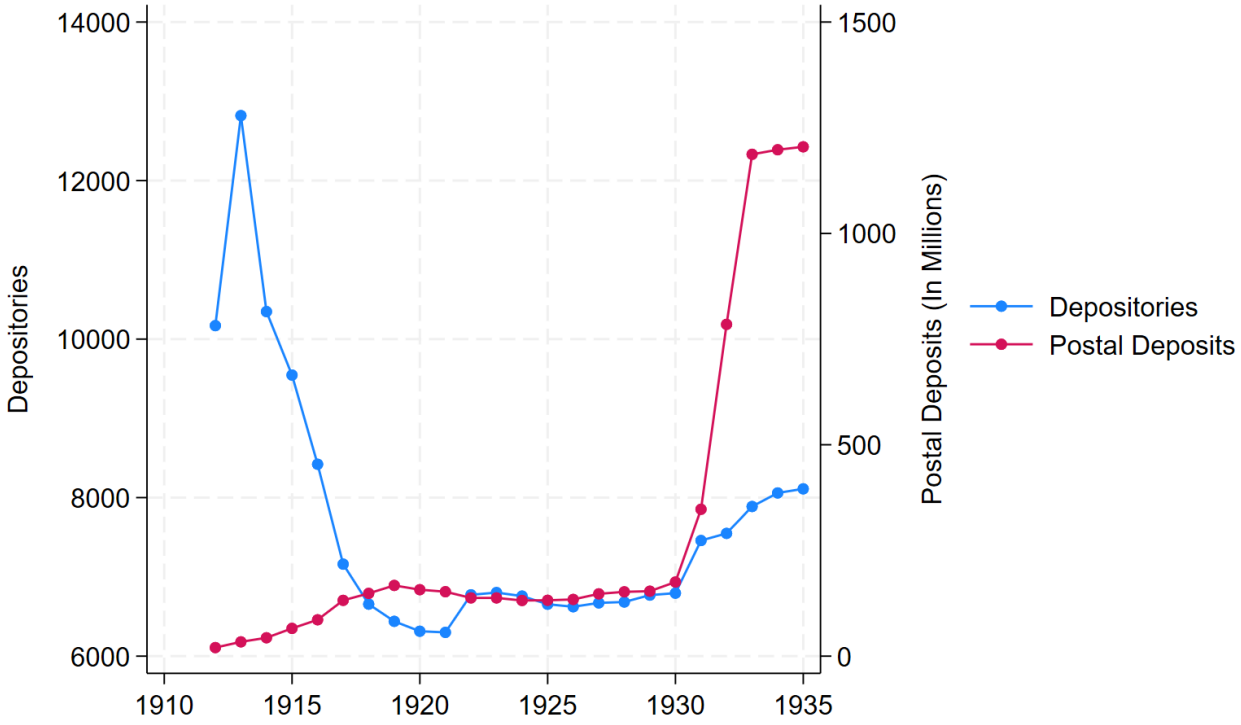
Note: Results show the results of an instrumental variables regression. The outcome variable is an indicator for whether a bank closed, for any reason, from 1929-1935. The instrumented variable for column 1 is the log of the amount on deposits (+1) in a town's Postal Savings bank. The instrumented variable for column 2 is the log of the number on depositors (+1) in a town's Postal Savings bank. 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). Standard errors clustered at the state level are provided in parentheses. *** p<0.01, ** p<0.05, * p<0.1

**Table A4: Summary Statistics of Towns With and Without Postal Savings in 1928**

| | Without Postal Savings (1928) | With Postal Savings (1928) | Difference |
|---|---|---|---|
| Town-level Variables | | | |
| Number of Banks (1928) | 1.26<br>(0.54) | 2.44<br>(5.08) | 1.18† |
| Percent with Postal Savings (1928) | 0 | 100 | 100† |
| County-level Variables (in 1929) | | | |
| Log(County Population) | 10.25<br>(1.10) | 10.65<br>(1.22) | 0.40† |
| County Percent Urban (2,500+) | 25.16<br>(26.99) | 37.87<br>(27.82) | 12.71† |
| Farms Per Person | 0.101<br>(0.048) | 0.0724<br>(0.047) | -0.0286† |
| Manufacturing Facilities Per Person | 0.0012<br>(0.0009) | 0.0014<br>(0.0008) | 0.0002† |
| Percent Paying Federal Taxes | 1.70<br>(2.06) | 2.57<br>(2.63) | 0.88† |
| Percent White | 90.46<br>(17.04) | 92.95<br>(3.30) | 2.50† |
| Bank-level Variables (in 1928) | | | |
| Ln(Assets) | 12.64<br>(0.93) | 14.19<br>(1.37) | 1.54† |
| $\frac{Cash}{Deposits}$ | 0.204<br>(0.119) | 0.173<br>(0.099) | -0.031† |
| $\frac{Loans}{Assets}$ | 0.628<br>(0.150) | 0.566<br>(0.148) | -0.062† |
| $\frac{Capital + Profits}{Assets}$ | 0.158<br>(0.07) | 0.137<br>(0.066) | -0.021† |
| $\frac{Profits}{Profits + Capital}$ | 0.366<br>(0.195) | 0.467<br>(0.23) | 0.101† |

Note: Table shows the average values for variables of interest between towns with and without postal savings in 1928. The data are aggregated to the town level before obtaining the town and county averages. Bank-level variables are bank-level averages. Standard deviations are in parentheses below the averages. The third column displays differences, and 2-sided t-tests were performed to determine if the zero and one-depositor groups differed. † $p<0.01$,

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




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