Failing Banks
Online Appendix

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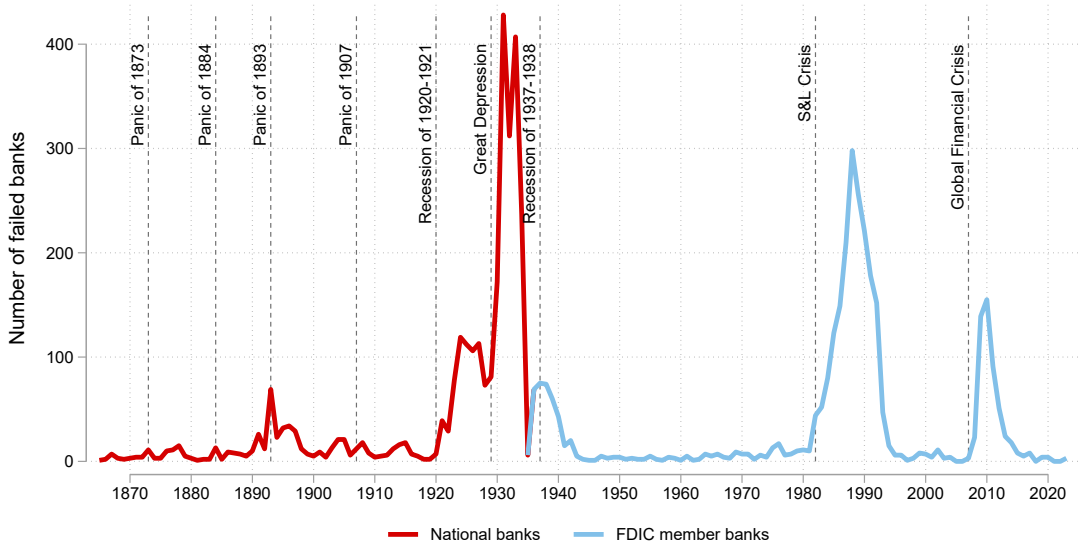
A Evolution of the U.S. Banking System and Bank Failures

This section charts the evolution of bank failures and banking regulation in the U.S. since 1865. Figure 1 in the paper shows failure rate throughout our sample. Figure A.1 plots the number of failures. Table A.1 summarizes the key institutional and regulatory features by era.

Figure A.1: ***Failing Banks: 1865-2023***



Notes: This figure plots the number of failed banks by year. Vertical lines indicate selected major banking crises and economic downturns. The red line plots the number of failing national banks, defined as national banks placed into receivership. The blue line plots the number of banks classified as failed by the FDIC. We restrict our sample of FDIC member banks to National Member Banks, State Member Banks, and State Nonmember Banks and exclude Savings Associations, Savings Banks, and Savings and Loans.

National Banking Era Our sample begins at the start of the National Banking Era, which spans the period between the Civil War and the founding of the Federal Reserve System, roughly 1863 to 1913. It was preceded by what is now referred to as the Free Banking Era, during which banks could charter under state laws after fulfilling a simple set of regulatory requirements. Since the United States did not have a central bank for most of the nineteenth century, these state-chartered banks were the main issuers of notes in circulation. To be able to issue bank notes, banks had to cover their note issuance with purchases of state-issued government bonds. This changed during the Civil War, when the federal government needed to finance the war. To increase demand for federal government bonds, Congress passed two laws (the National Currency Act in 1863 and the National Banking Act in 1864) that allowed banks to be chartered under federal law—thus the name: national banks. Like state banks before them, national banks were allowed to issue bank notes when backed by government bonds. Currency issued by state banks was taxed at a high rate that encouraged banks to adopt national charters and purchase federal government bonds. The National Banking Act also established a regulatory and

supervisory authority, the Office of the Comptroller of the Currency (OCC). The OCC published national bank balance sheets every year in an annual report to Congress, as discussed in the data section. Although the National Banking Era started in 1863, the 1863-64 OCC Annual Reports did not provide bank-level balance sheet information at the same detail as subsequent years.

Other than issuing currency, national banks operated very much as banks do today, by taking deposits and making loans. However, there was very little government interference. For instance, there was no insurance for deposits. Moreover, as there was no central bank, there was also no lender of last resort to help banks in a crisis.[1] Thus, in this period, we can be reasonably confident that bank behavior was not driven by the anticipation of government support. Moreover, national banks were restricted to operating as unit banks, which meant that each bank could only operate a single branch serving a single location. Finally, capital regulation during the national Banking Era did not restrict the leverage ratio but reflected entry barriers (Carlson et al., 2022). At the founding of a bank, the bank charter would determine the dollar-amount of capital paid in to the bank with a minimum amount determined by the population of the bank's location. Thereafter, banks were largely able to choose their leverage freely subject to market conditions, though banks did face restrictions on dividend payouts based on their surplus. National banks were subject to double liability. In the event of failure, a receiver would levy an additional assessment on the bank shareholders' equal to the par value of subscribed capital to cover losses to depositors (Grossman, 2010). National banks were subject to double liability until 1937. National banks also faced portfolio restrictions limiting their capacity to lend against real estate collateral (White, 1983).

The National Banking Era witnessed a series of banking crises. The banking crisis chronology of Baron et al. (2021) records banking crises featuring widespread bank failures and panic-runs in 1873, 1884, 1890, 1893, and 1907.[2] For the National Banking Era, Figure 1 shows that the rate of failure of national banks was highest around the Panic of 1893.

Early Federal Reserve & Great Depression The recurring financial crises of the National Banking Era led to the creation of a central bank through the Federal Reserve Act of 1913. The Federal Reserve could serve as a lender of last resort and had the responsibility to supervise member banks.

The McFadden Act 1927 liberalized restrictions on national banks. Before the Act, national banks were prohibited from opening branches. The Act allowed national banks to branch in states where state banks were permitted to branch, a step toward liberalization of geographic restrictions (see, e.g., Rajan and Ramcharan, 2016). The McFadden Act also liberalized rules for Federal Reserve member banks to lend against real estate and expanded lending limits to single borrowers. Moreover, the McFadden act rechartered the Federal Reserve into perpetuity, removing the risk that the charter would be revoked,

[1] Treasury performed quasi-central bank operations toward the end of the National Banking Era, but the interventions were small (Friedman and Schwartz, 1963).

[2] See also Jalil (2015), who records 1873, 1893, and 1907 as "major" banking panics, defined as an increase in the demand to convert deposits into currency that leads to bank runs and bank suspensions.

Table A.1: *Evolution of the U.S. Banking System*

Era	Years	Deposit insurance	Central bank	Capital regulation	Geographic restrictions
National Banking Era	1863-1913	No	No	$ by pop	Unit-branch**
Early Federal Reserve	1914-1928	No*	✓	$ by pop	Unit-branch**
Great Depression	1929-1935	No*	✓	$ by pop	Local branching
Boring Banking	1959-1982	✓	✓	Supervisory Discretion	Local branching
Deregulation and S&L	1982-2006	✓	✓	Leverage ratio in 1985 Basel I in 1989	Limited until 1994
Global Financial Crisis	2007-2015	✓	✓	Basel II/III + DFAST	No
Post-crisis	2015-	✓	✓	Basel II/III + DFAST	No

Notes: *There was no deposit insurance for national banks until the founding of the Federal Deposit Insurance Corporation (FDIC) in 1933. However, selected states implemented deposit insurance schemes for state-chartered banks already before 1933 (see Calomiris and Jaremski, 2019). ** Local branching was permitted for state banks in selected chartered states. National banks were not allowed to branch until the McFadden Act of 1927. This Act allowed national banks to branch in states in which state-chartered institutions were permitted to branch.

as had occurred with the First and Second Banks of the United States.

The 1920s witnessed a rise in banking failures. Failures were concentrated in agricultural states and primarily affected small, rural banks. The rise in bank failures was driven by a sharp decline in agriculture and land prices in agrarian states, as well as rising urbanization that weakened the position of rural banks (Friedman and Schwartz, 1963). Figure 1 shows that the failure rate of national banks reached a new high in the 1920s, even before the Great Depression.

The Great Depression further exacerbated distress among banks, and several scholars have argued that the banking crisis, in turn, contributed to the severity of the downturn (e.g., Friedman and Schwartz, 1963; Bernanke, 1983). The wave of bank failures prompted a decades-long debate about whether failures were mainly liquidity-based due to depositor runs (Friedman and Schwartz, 1963) or driven by fundamentals such as rising losses (Calomiris and Mason, 2003). Richardson and Troost (2009) exploit that the Atlanta and St. Louis Federal Reserve banks followed different lender of last resort policies and find that Fed liquidity reduced bank failures and boosted lending, pointing to a role for liquidity-based failures. This also highlights that lender of last resort facilities were not uniformly available, even with a central bank, especially as the discount window became stigmatized.

The Great Depression prompted a wave of banking reforms. Deposit insurance was introduced in 1933 and then made permanent in 1934 with the creation of the FDIC.[3] Great Depression banking reform also imposed a range of limits of banking activities (Kroszner and Strahan, 2014). The Glass-Steagall Act prohibited commercial banks from engaging in investment banking activities (corporate bond and equity underwriting).

[3]State level deposit insurance systems had existed before, but these became inoperative by Great Depression (Calomiris and Jaremski, 2019). State-level deposit insurance schemes did not apply to national banks.

It also imposed limits on interest rates that banks could pay on deposits, known as Regulation Q (Gilbert, 1986).

The Great Depression brought an end to shareholder double liability. The Banking Act of 1933 allowed for the issuance of shares without double liability, and the Banking Act of 1935 allowed national banks to remove double liability from their shares in 1937 (Tufts and Tufts, 2001). Double liability was unpopular among bank shareholders following the high rates of failure during the Depression. It was also seen as ineffective in preventing bank failures and unnecessary with the advent of deposit insurance (Grossman, 2001).

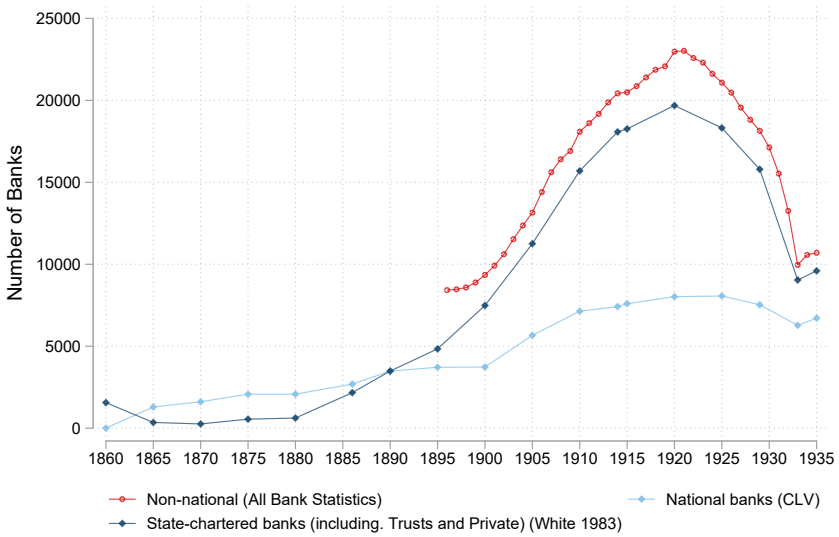
Some notes on the Dual Banking System In our analysis in the main paper, we rely entirely on data on national banks for the period prior to the founding of the FDIC. As noted in the main text, the main reason for focusing on national banks is the availability of consistent records provided by the OCC on both balance sheets and bank failures. However, it is important to highlight that the US banking system featured several types of financial institutions that were not chartered under federal law but state law. National banks always coexisted alongside state banks, trusts, and private banks, with the relative importance of each type of institution varying over time.

For instance, Figure A.2 plots the number of national banks and state-chartered institutions (panel (a)) and their market share of total banking assets (panel (b)). National banks had a very large market share of the entire banking market ranging of around 80% at the onset of the National Banking Era. This large market share is related to the fact that the National Banking Act imposed a tax on notes issued by state banks, making state bank charters very unattractive. However, starting in the 1880s, the rise as of deposits as form of money, slowly eroded the advantage of national bank's to issue notes. Thus, over time the market share of national banks started to shrink, reaching 45% by the 1930s. More generally, state-chartered institutions tended to be active in smaller markets in which national banks, which faced considerable stricter regulatory requirements, were not viable. Hence, state banks tended to be smaller in size, but there tended to be more state banks than national banks. This naturally implies that national banks tended to have larger, more financially sophisticated depositors than state banks.

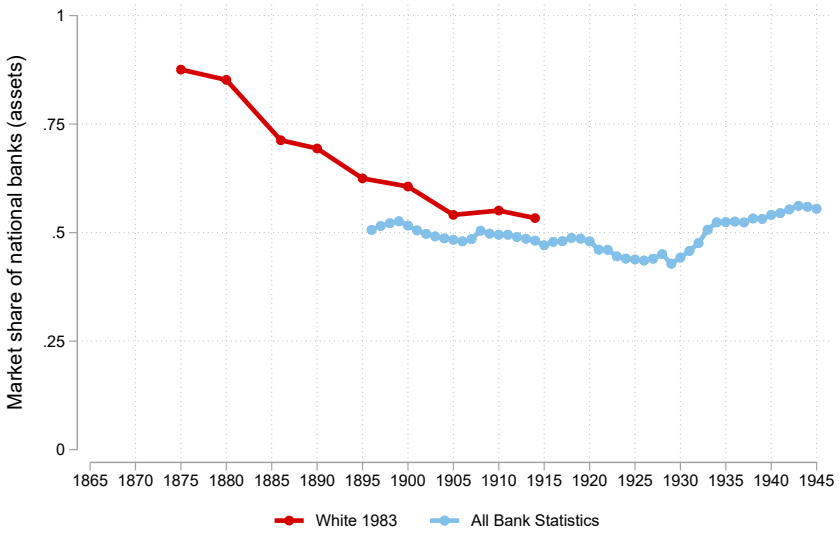
While Figure 1 in the main text plots the failure rate (receivership) of national banks, Figure A.3 plots the suspension and receivership rates for national banks and suspension rates for state-chartered institutions. Observe that before 1892, there is no reliable source of state bank suspensions and receivership. After 1892, it become possible to construct a series for both. Figure A.3 shows that failure rates co-moved broadly, with state banks facing slightly higher failure rates than national banks. However, note that the counts of state-chartered institutions changed across sources (differing in the inclusion of trusts, mutual banks, and private institutions), making it *de facto* impossible to construct on consistent time series of failure rates across all bank types. Hence, the levels of failure rates before and after 1920 are not comparable across time.

Figure A.2: *Number of Banks by Type and the Market Share of National Banks*

(a) *Number of banks*

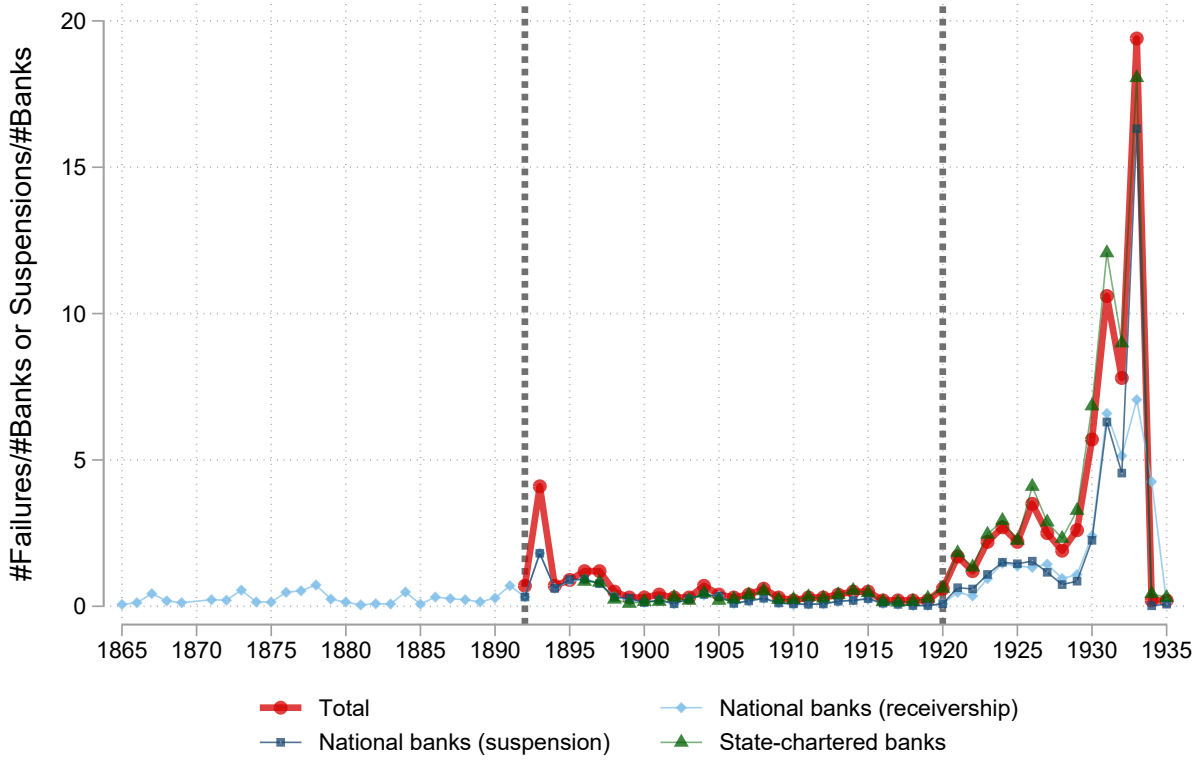


(b) *Market share of national banks based on total assets*



Notes: Data on state banks, trusts, and private bank are as indicated in the legend either taken from White (1983) and "All Bank Statistics" digitized by Flood (1998). State bank assets are available from 1875 onwards in White (1983); assets of trusts and private bank from 1886 onwards in "All Bank Statistics". Number of national banks in panel (a) are taken from the sample used in this paper.

Figure A.3: *Bank Failures and Suspensions by Bank Type*



Notes: This figure combines various sources to construct a rate of bank failure from 1865 through 1935 for national banks, state-chartered banks, and all banks combined. From 1865-1891, we use the U.S. Comptroller of the Currency Annual Report list of failed banks. From 1892-1920, the number of bank suspensions are from Chapter X of the "Historical statistics of the United States, Colonial Times to 1957" (available here). For 1921-1934, data are the Board of Governor's from "Bank Suspensions, 1892 - 1935" (available at here). Note that differences in sources between 1864 and 1892, 1892-1920, and 1921-1934 complicate comparisons across time.

Boring Banking We refer to the era from 1959 through 1982 as the "Boring Banking" Era. The term "Boring Banking" is inspired by Paul Krugman, who wrote in the New York Times on April 9, 2009: "Thirty-plus years ago, when I was a graduate student in economics, only the least ambitious of my classmates sought careers in the financial world. Even then, investment banks paid more than teaching or public service - but not that much more, and anyway, everyone knew that banking was, well, boring." During this era, failure rates were low. Banks' activities were restricted by the Depression-era regulations. Furthermore, the 1956 Bank Holding Company Act allowed states to restrict entry by out-of-state banks and holding companies, which effectively prohibited interstate banking. There was no explicit capital requirements. Instead, capital regulation was conducted by supervision, and supervision focused not just on capital ratios but on a broader range of quantitative and qualitative factors (Haubrich, 2020).

Rising inflation and interest rates led to outflows of deposits from commercial banks and into money market funds that were not subject to interest rate ceilings. This led to a phasing out of interest rate ceilings on deposits with the 1980 Depository Institutions Deregulation and Monetary Control Act (Kroszner and Strahan, 2014).

Deregulation and Savings & Loan (S&L) Crisis The period of low bank failure rates came to an end in the with a rise in bank failures in the second half of the 1970s. Bank failures further increased in the 1980s. While the failures in the S&L crisis were highest among thrifts, commercial banks also saw high failure rates during 1980s (see Figure 1). The S&L crisis is often dated to 1984 based on the failure of Continental Illinois, which represented the largest bank failure in U.S. history at the time. Failures in the 1980s were driven by a combination of high interest rates, the severe recessions over 1980-1982, losses in oil and gas loans, and losses from exposure to the Latin American debt crisis.

In response to rising bank failures[4] and a trend of declining bank capital ratios discussed below, the 1980s witnessed the formal introduction of modern regulatory capital ratios that require a minimum amount of equity finance as a share of total assets. In the early 1980s, both the OCC and the Federal Reserve communicated a simple leverage ratio requirement of 5% equity finance and noted that banks falling short of this cutoff would be considered undercapitalized.[5] The International Lending Supervision Act (ILSA) of 1983 then formally required regulatory agencies to explicitly set capital ratios. By 1985, Federal Reserve, OCC, and the FDIC had formalized and published final regulations similar to those of the original 1981 guidelines.

Following this period of formalizing capital regulation, capital requirements based on risk-weighted assets also became increasingly popular. In the 1950s, the Federal

[4]Rising inflation and interest rates led to outflows of deposits from commercial banks and into money market funds that were not subject to interest rate ceilings. This also led to a phasing out of interest rate ceilings on deposits with the 1980 Depository Institutions Deregulation and Monetary Control Act (Kroszner and Strahan, 2014).

[5]Both the Federal Reserve and the OCC published numerical capital ratios in 1981. According to Tarullo (2008), the agencies in effect adopted a minimum requirement of capital-to-assets of 5%. The FDIC only published guidelines on "minimum acceptable levels" of primary capital. The original published requirements excluded the 17 largest banks (those with $15B or more in assets) but by June 1983, these banks were also included.

Reserve developed its Analyzing Bank Capital (ABC) model, which was an early method to construct a capital ratio based on risk-weighted assets. The S&L Crisis also led Congress to pass the FDIC Improvement Act in 1991. A key provision of this Act was the introduction of Prompt Corrective Action (PCA), which requires supervisors avoid exercising forbearance and to take increasingly severe actions when a bank is deemed to be undercapitalized.

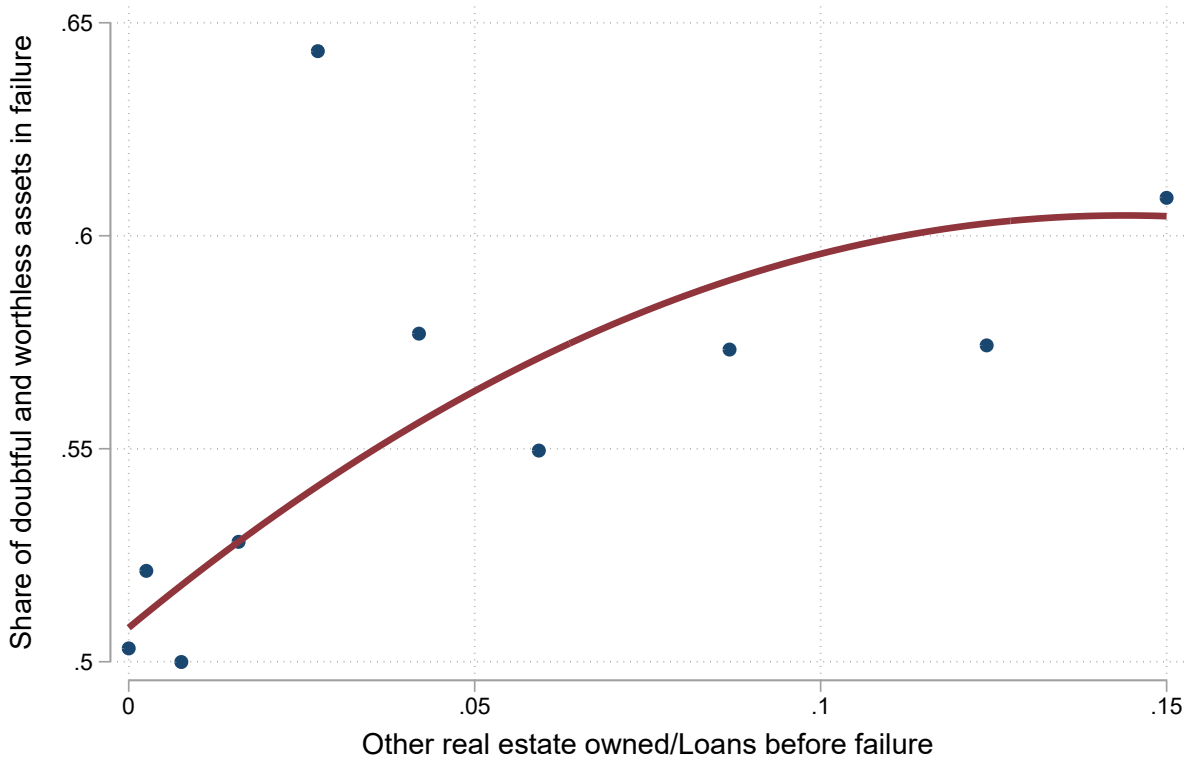
At the same time, there was a move toward levelling the international playing field for banks. To this end, the Basel I accord was finalized in 1988 and implemented in the U.S. in 1991. Basel I introduced a minimum capital requirement of 8% based on risk-weighted assets. Risk-weight varied from 0% for supposedly risk-free assets such as cash up to 100% for the most illiquid and risky forms of bank lending such as corporate debt. Further, to address various practical issues around the implementation of Basel I was revised and followed by Basel II in 2007. The Basel II framework left the overall required amount of capital unchanged but allowed for the possibility of banks opting into using their own internal risk models rather than the simple risk weights provided in Basel I. Moreover, Basel II attempted to address issues around off-balance sheet exposures that allowed for an effective circumvention of capital requirements.

Global Financial Crisis and Beyond Finally, the Global Financial Crisis (GFC) initiated additional drastic changes in regulation and supervision of financial institutions. Basel III and the Dodd-Frank Act led to both more stringent and more complicated capital requirements. Capital ratios were increased relative to Basel II and the definition of what constitutes capital was tightened. Capital requirements became differentiated by bank, with the tighter requirements for the largest banks, the Global Systemically Important Banks. Basel III also introduced a capital conservation buffer, limiting bank payouts when capital falls close to the minimum capital ratios, and a counter-cyclical capital buffer (CCyB), which is set at the discretion of the Board of Governors of the Federal Reserve.

The aftermath of the GFC also saw the rise of stress testing. A stress test assesses whether banks are sufficiently capitalized to withstand adverse scenarios. Effectively, the stress test represents a form of a forward-looking, bank-specific capital requirement. In early 2009, at the height of the crisis, the Supervisory Capital Assessment Program (SCAP)—subsequently replaced by the Comprehensive Capital Analysis and Review (CCAR)—represented the first stress testing effort. SCAP aimed to ensure that the 19 largest banks had sufficient capital coming out of the crisis to absorb losses under poor economic conditions. The Dodd-Frank Act formalized regular stress tests for the largest banks (DFAST) in 2013. Under CCAR, each bank must propose a capital distribution plan incorporated into the stress test, whereas DFAST uses a standardized capital distribution plan that holds dividends at their current level and sets net repurchases to zero. DFAST also requires banks to run (and disclose) stress tests using the same set of inputs (i.e., the Fed's scenarios and the standard capital distribution plan) but with their own, internally developed model.

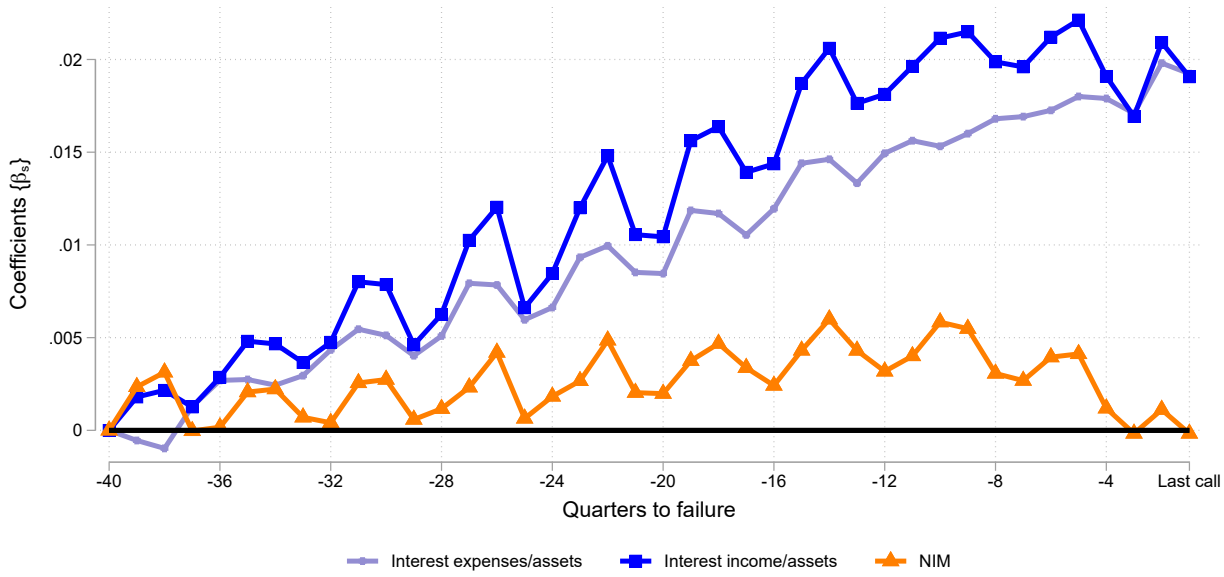
B Appendix Figures and Tables

Figure B.1: ***Other Real Estate Owned before Failure and Share of Doubtful and Worthless Assets in Failure***



Notes: This figure shows a binned scatter plot correlating the share of Other Real Estate Owned (OREO) a failing bank reports before failure as a share of its total outstanding loans before failure (x-axis) with the share of assets that the OCC classified as "doubtful" or "wortheless" after the bank failed (y-axis). Data for failing banks from 1889 through 1904.

Figure B.2: ***Interest Income, Expenses and NIM: 1959-2023***

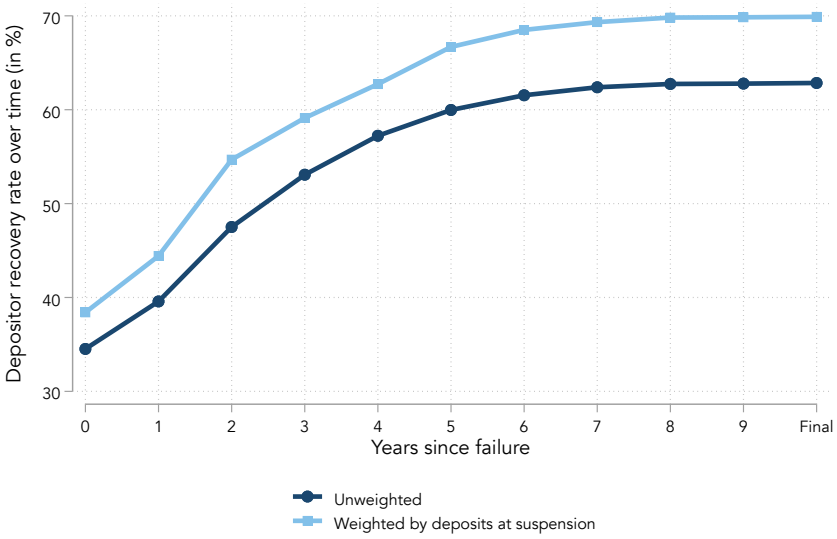


Notes: The figure shows the sequence of coefficients from a regression of the following form:

$$y_{b,t} = \alpha_b + \sum_{j=-10, j\neq -10}^{0} \beta_j \times \mathbf{1}_{j=t} + \epsilon_{b,t}$$

where y_{bt} is the ratio indicated in the figure legends, and α_b is a set of bank fixed effects. The sample is restricted to failing banks and to the ten years before they fail and banks that fail after 1959. The net interest margin (NIM) is defined as the difference of total interest income net of interest expenses normalized by total assets.

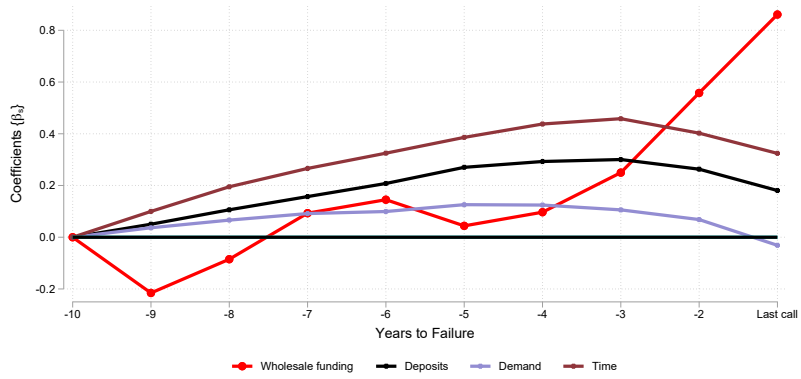
Figure B.3: ***Deposit Recovery Rate over Time Following Bank Failure: 1920-1939***



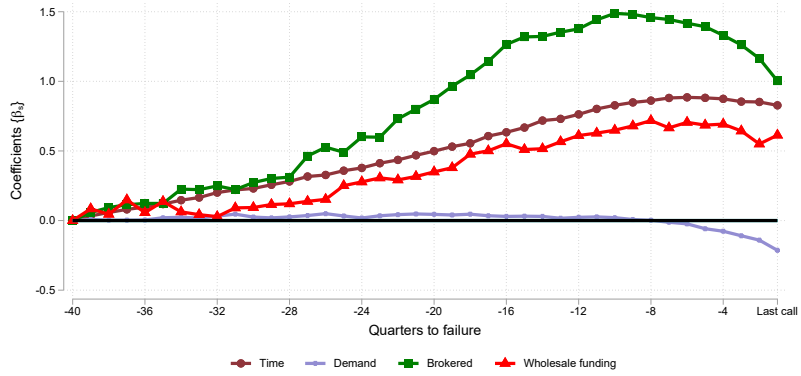
Notes: The figure shows the average depositor recovery rate as a function of the time since failure. The sample covers bank failures from 1920 to 1939, as this sample allows us to observe the dividend payments to depositors in each year from the suspension to when the bank is finally closed. Data are collected from the OCC's annual report to Congress; tables on "National banks in charge of receivers" (various years).

Figure B.4: *Funding of Failing Banks: Outcomes in Natural Logarithms*

(a) *1865-1934: Deposits and Wholesale Funding*



(b) *1959-2023: Time, Demand, and Brokered Deposits, and Wholesale Funding*

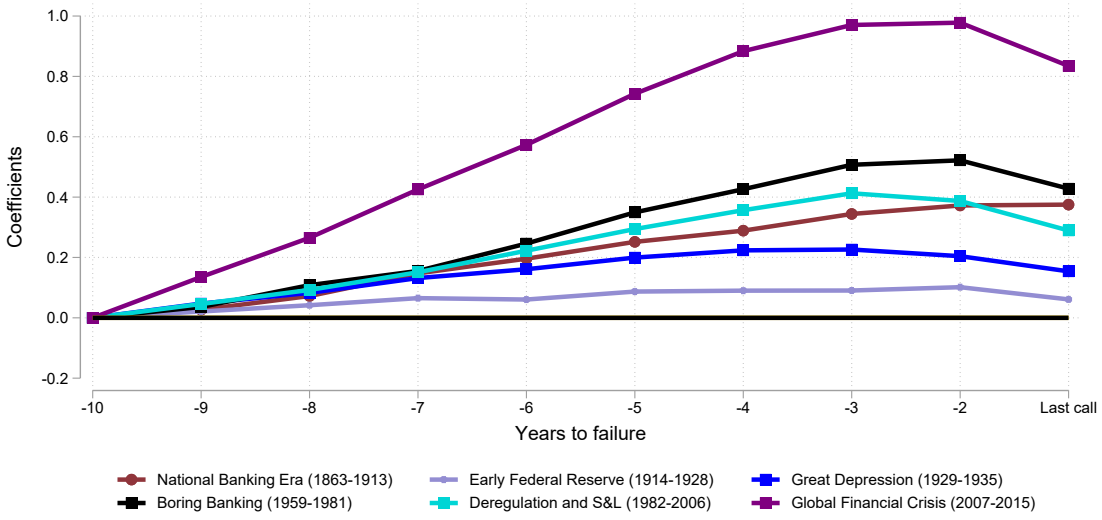


Notes: The figure shows the sequence of coefficients from a regression of the following form:

$$y_{b,t} = \alpha_b + \sum_{j=-10, j\neq -10}^{0} \beta_j \times \mathbf{1}_{j=t} + \epsilon_{b,t}$$

where y_{bt} is the natural logarithm of the line item indicated in the figure legends and α_b is a set of bank fixed effects. The sample is restricted to failing banks and to the ten years before they fail. In panel (a), the sample is restricted to data from 1865 though 1934 and in panel (b) to data from 1959 through 2023.
In panel (a) wholesale funding is defined as the sum of "Bills Payable" and "Rediscounts". In panel (b), wholesale funding is the amount reported in the call report line item "other borrowed money" which pools various sources of bank wholesale funding, such as advances from Federal Home Loan Banks (FHLBs), other types of wholesale borrowings in the private market, and credit extended by the Federal Reserve.

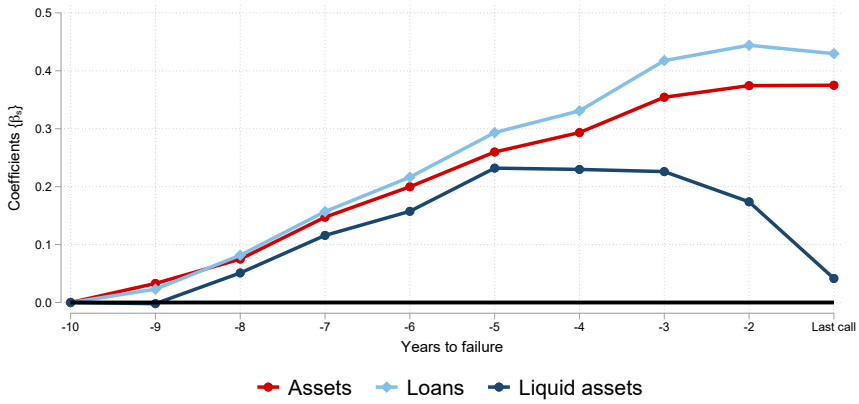
Figure B.5: ***Assets in Failing Banks: 1863-2023, By Historical Subsamples***



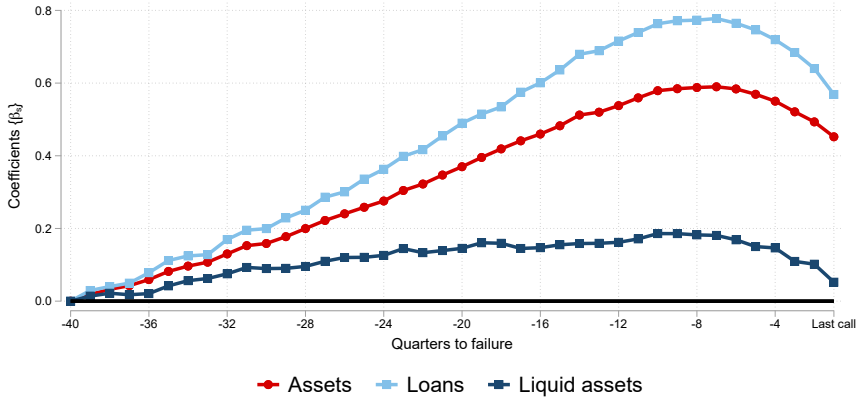
Notes: This figure reports the sequence of coefficients from estimating Equation (1) with log total assets (deflated by CPI) as the dependent variable for various subsamples. The regression includes a set of bank fixed effects. The sample is restricted to failing banks and to the ten years before they fail. The sub-samples indicated in the figure legends are selected based on the years in which a bank failed.

Figure B.6: *Liquid and Illiquid Assets in Failing Banks*

(a) *1865-1935*

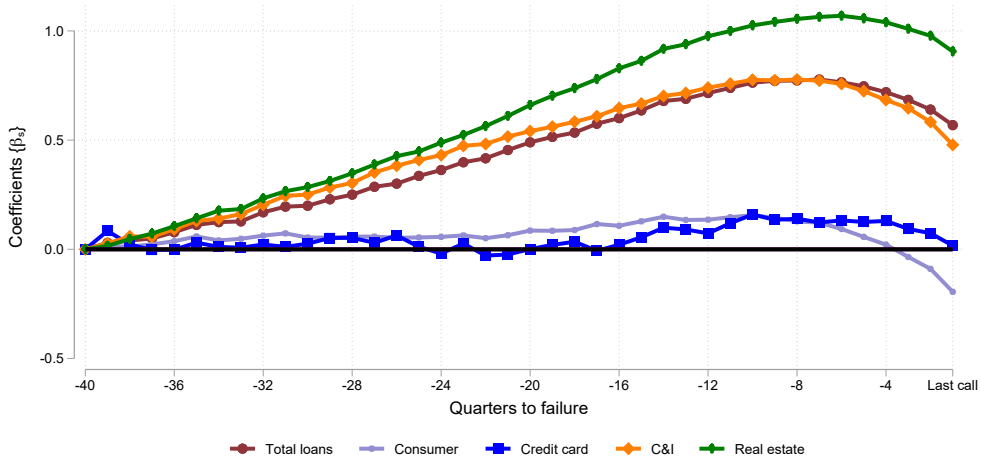


(b) *1959-2023*



Notes: This figure plots the sequence of coefficients from estimating Equation (1) with the logarithm of either assets, loans, or liquid assets (all deflated by the CPI) as the dependent variable for different samples. The specification includes a set of bank fixed effects. The sample is restricted to failing banks and to the ten years before they fail. From 1865 through 1941, we define liquid assets as the sum of currency, checks, legal tender, interbank claims, bonds to secure deposits and bonds on hand, and bills of national banks and state banks. From 1959 onwards, liquid assets are defined as currency and reserves held, balances with other banks, cash items in collection, and security holdings (both government-issued and private label).

Figure B.7: *Asset Growth in Failing Banks is Driven by Real Estate and C&I Lending*

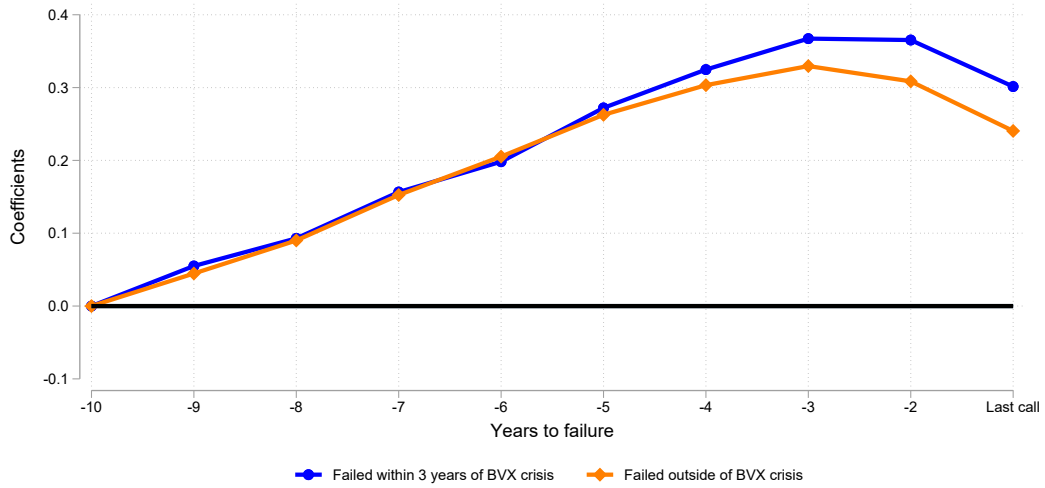


Notes: This figure presents the sequence of coefficients from a regression of the following form

$$y_{b,t} = \alpha_b + \sum_{j=-10, j\neq -10}^{0} \beta_j \times \mathbf{1}_{j=t} + \epsilon_{b,t},$$

where y_{bt} is a type of bank loan. The same is restricted to failing banks and to the ten years before they fail. The estimates are based on the post-1959 sample. Data on loan types is not available for the pre-1935 sample.

Figure B.8: ***Asset Growth in Failing Banks for Failures Occurring during Financial Crises versus Normal Times***

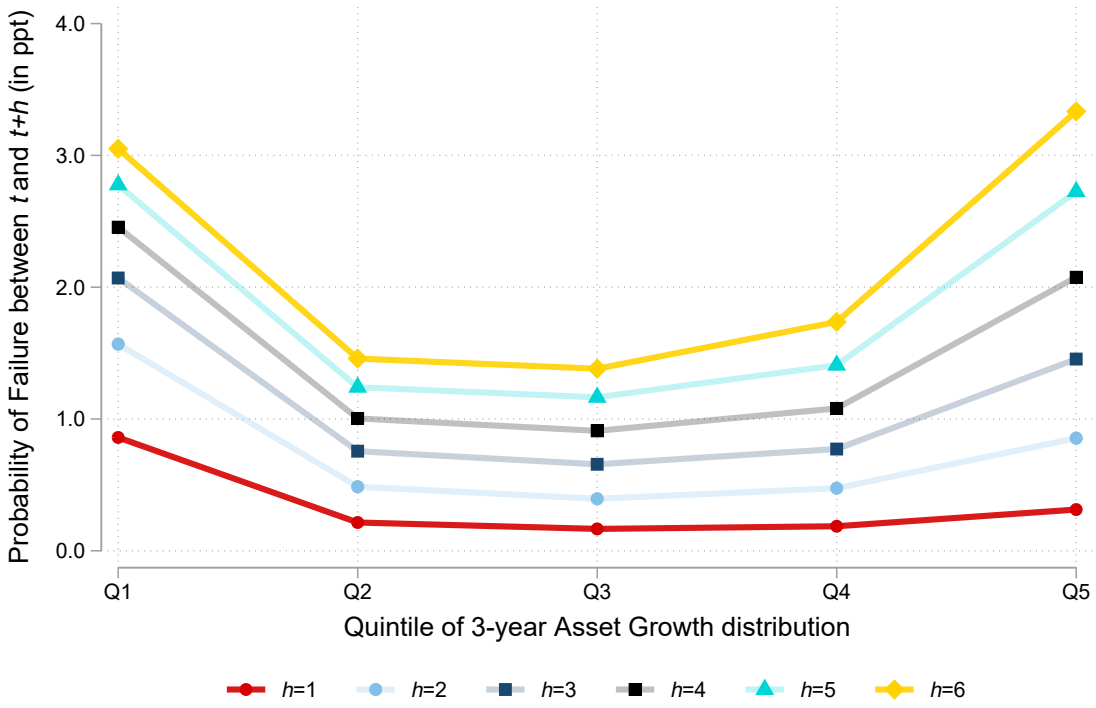


Notes: Both panels shows the sequence of coefficients from a regression of the following form:

$$y_{b,t} = \alpha_b + \sum_{j=-10, j\neq -10}^{0} \beta_j \times \mathbf{1}_{j=t} + \epsilon_{b,t}$$

where y_{bt} is either bank b' assets, deposits, or loans and α_b is a set of bank fixed effects. The sample is restricted to failing banks only and to the ten years before they fail. Financial crises are defined according to Baron et al. (2021)

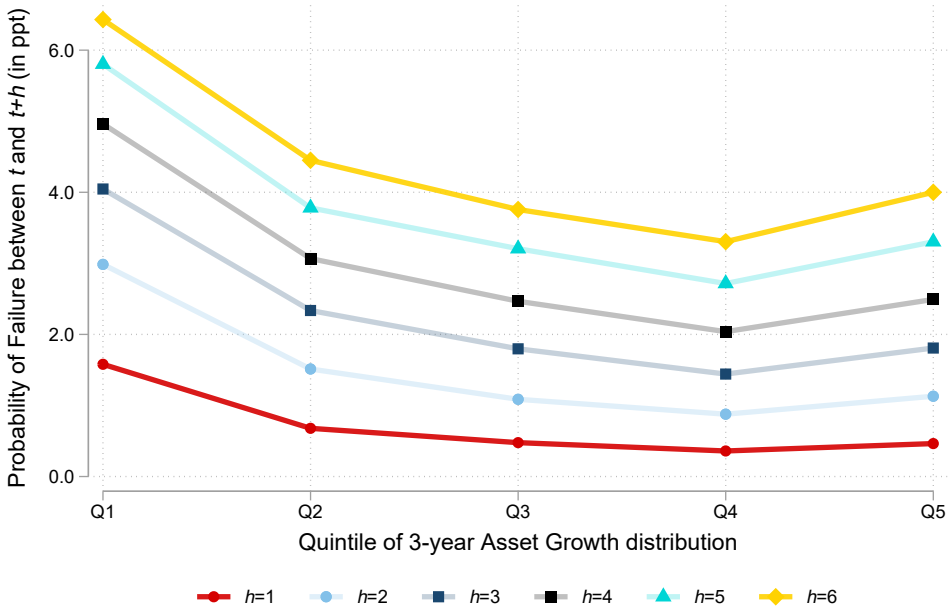
Figure B.9: ***Failure Probability in the Cross-Section of Asset Growth***



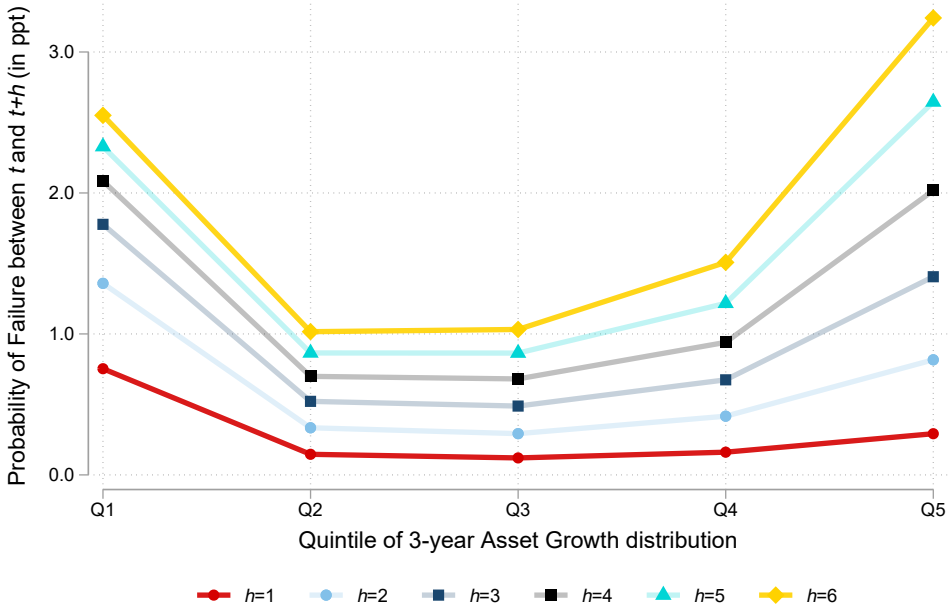
Notes: This figure plots the frequency of failure at the one to six year horizons across quintiles of the three-year asset growth distribution. Appendix Figure B.10 shows this figure separately for the pre- and post-FDIC samples.

Figure B.10: *Non-Monotonic Intertemporal Relation between Growth and Failure Probability*

(a) *Pre-1935*

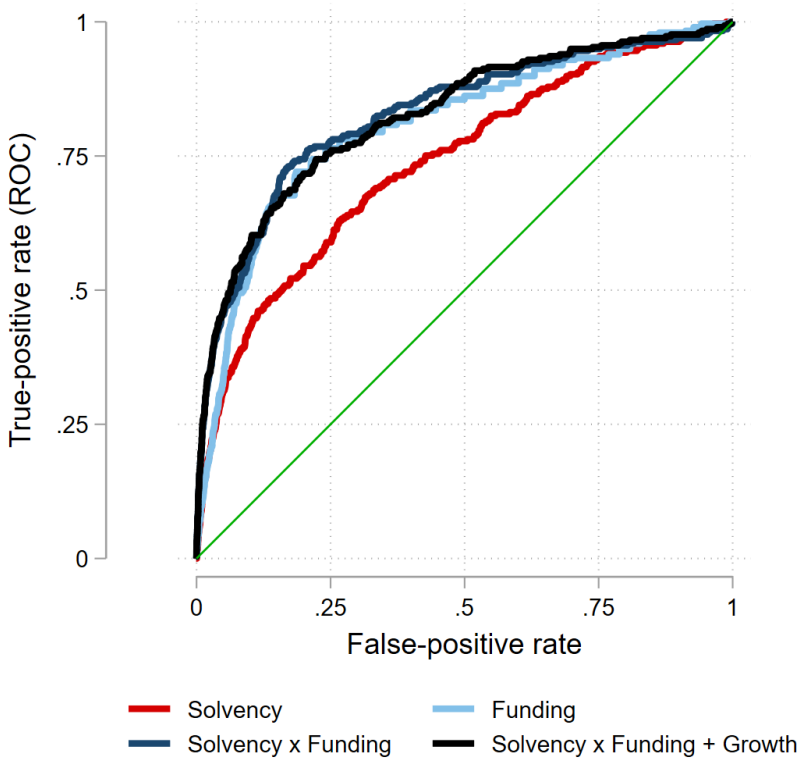


(b) *Post-1935*



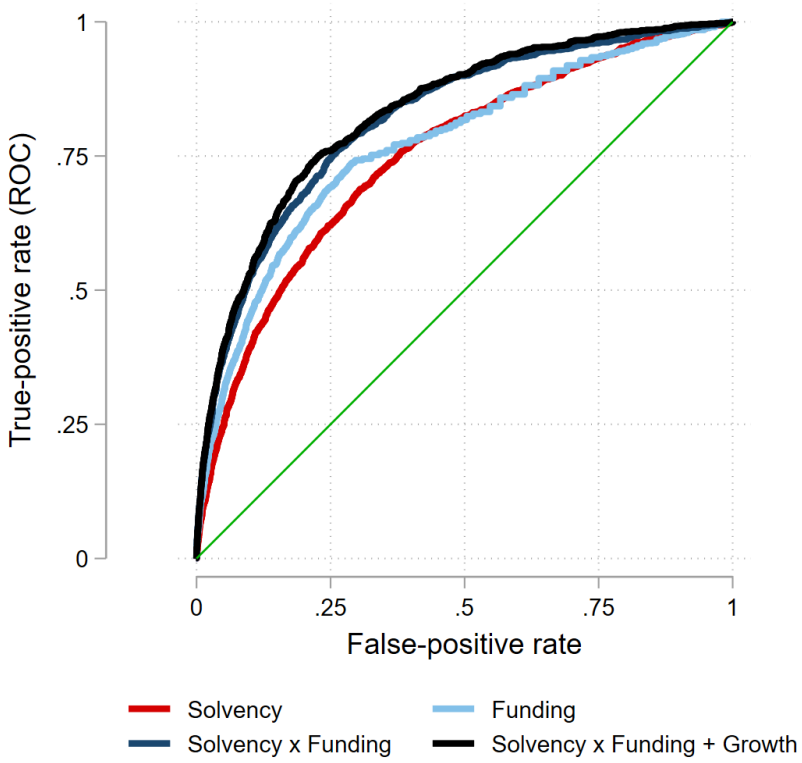
Notes: This figure plots the frequency of failure at the one to six year horizons across quintiles of the three-year asset growth distribution. Panel (a) presents the results for the 1865-1935 sample, and panel (b) presents the results for the 1959-2023 sample.

Figure B.11: *ROC Curves: 1870-1904 Sample*



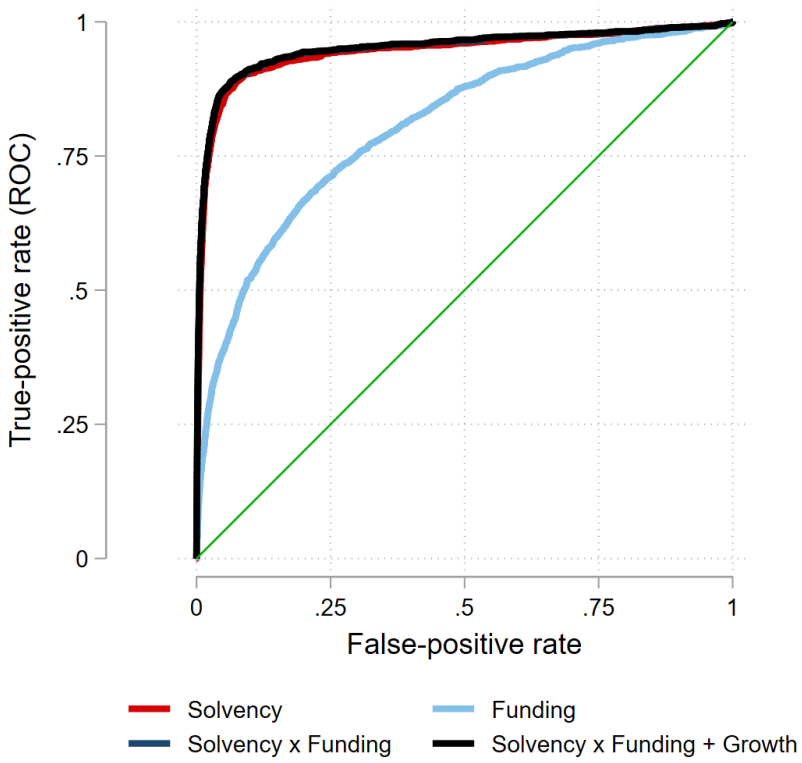
Notes: This figure plots the receiver operating characteristic (ROC) curve for the estimates based on columns (1) through (4) of Table B.6.

Figure B.12: *ROC Curves: 1929-1935 Sample*



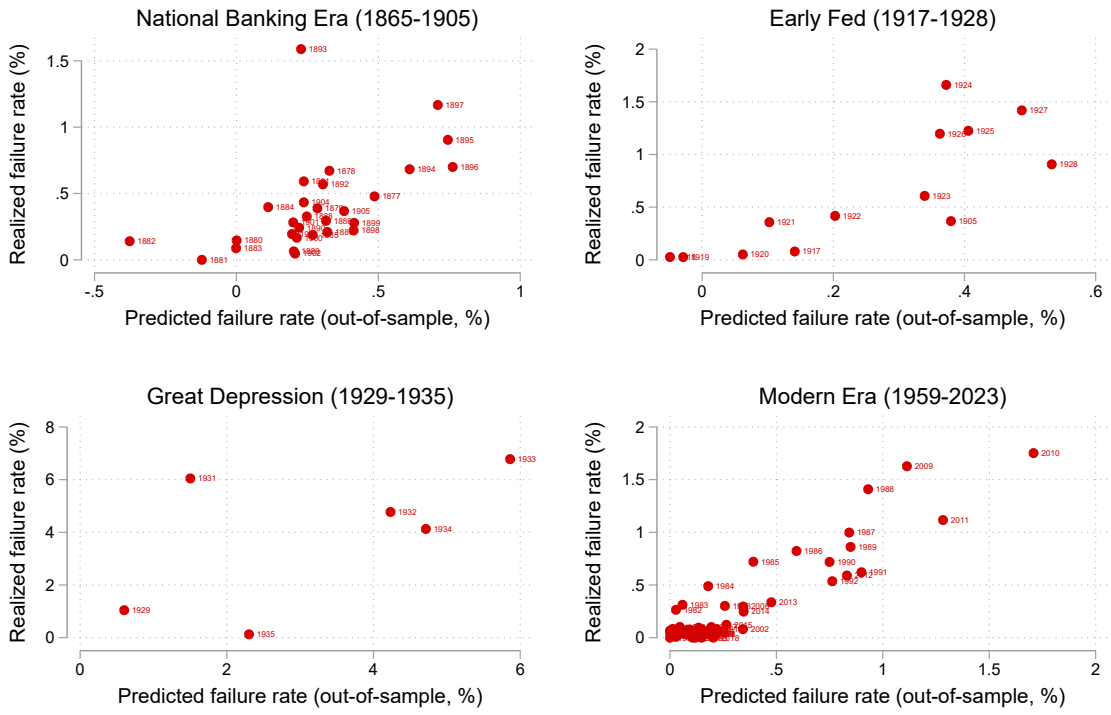
Notes: This figure plots the receiver operating characteristic (ROC) curve for the estimates based on columns (1) through (4) of Table B.8.

Figure B.13: *ROC Curves: 1959-2023 Sample*



Notes: This figure plots the receiver operating characteristic (ROC) curve for the estimates based on columns (1) through (4) of Table B.9.

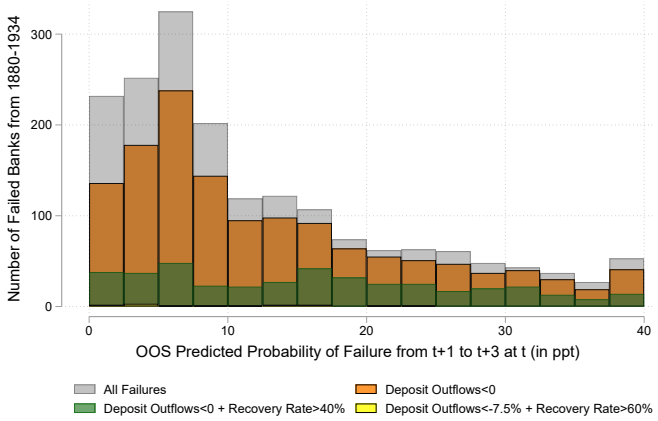
Figure B.14: *Fundamentals Predict Aggregate Waves of Bank Failures*



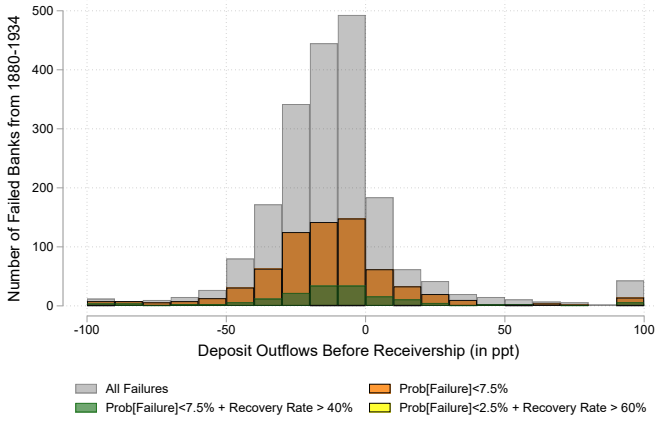
Notes: This figure plots the the realized bank failure rate against the out-of-sample predicted failure rate separately by era.

Figure B.15: ***Number of Pre-FDIC Failures by Predictability, Deposit Outflows, and Asset Recovery Rate.***

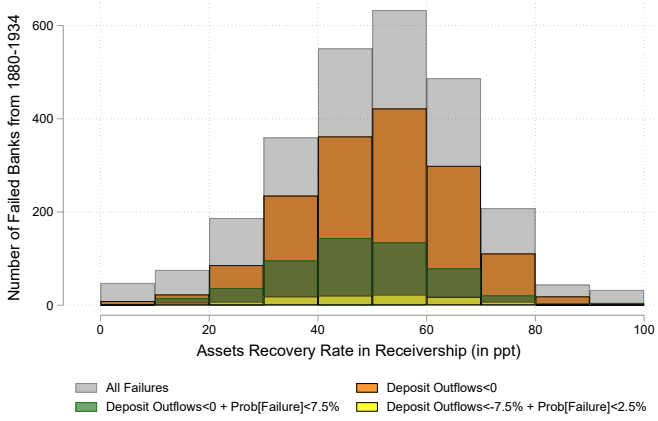
(a) *Frequency of Failures by Predictability*



(b) *Frequency of Failures by Deposit Outflows*



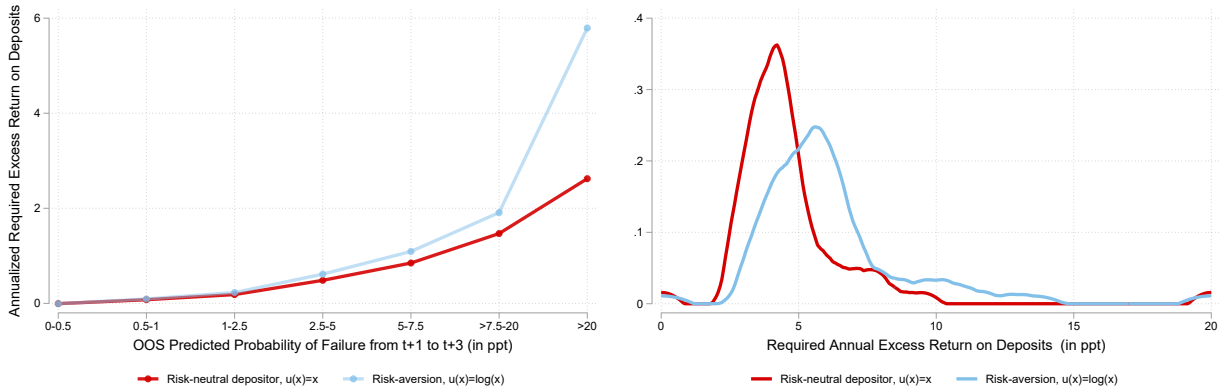
(c) *Frequency of Failures by Recovery Rate*



Notes: This figure plots the number of bank failures by out-of-sample predicted probability of failure over three year right before failure (panel (a)), by the recovery rate of assets held in receivership (panel (b)), and deposit outflows between last call report and in failure (panel (c)). We clip the out-of-sample predicted probability of failure at 40 ppt.

Figure B.16: ***Implied Required Excess Returns for the pre-FDIC sample.***

(a) *Required Returns by OOS predicted failure probability* **(b)** *Required returns for* $\hat{p} > 20\%$



Notes: The left panel shows the required excess return on deposits by out-of-sample predicted probability of failure over three years. The right panel plots the distribution of the required excess return on deposits (winsorized at 50%) for bank with a predicted probability of failure of larger than 20%. We calculate the required return on deposits, $s_{b,t}$, as the solution to the following equation:

$$(1 - \hat{p}_{b,t+1|t})u(1 + r_t + s_{b,t}) + \hat{p}_{b,t+1|t}u(1 - \ell_{t+1|t}) = u(1),$$

where $\ell_{t+1|t}$ is the loss rate on failures up to time t and r_t is the rate on treasury bills in year t. For risk-neutral depositors, we assume $u(x) = x$, and for risk-averse borrowers we assume $u(x) = ln(x)$.

Table B.1: ***Summary Statistics: Bank-level Data from 1865 through 1941***

	N	Mean	Std. dev.	1st	10th	25th	75th	90th	99th
Failing bank	371,856	0.18	0.38	0.00	0.00	0.00	0.00	1.00	1.00
Equity/assets	111,044	0.35	0.12	0.11	0.20	0.27	0.44	0.51	0.65
Loans/assets	111,044	0.55	0.13	0.20	0.37	0.46	0.64	0.71	0.80
Deposits/assets	111,044	0.46	0.18	0.07	0.21	0.33	0.59	0.69	0.81
Liquid assets/assets	111,042	0.20	0.10	0.04	0.09	0.12	0.25	0.34	0.52
NPL/loans	111,030	0.01	0.03	0.00	0.00	0.00	0.00	0.03	0.14
Wholesale funding/assets	111,044	0.01	0.04	0.00	0.00	0.00	0.00	0.04	0.18
Dividend payouts restricted	115,444	0.05	0.21	0.00	0.00	0.00	0.00	0.00	1.00
3-year asset growth	339,632	-0.00	0.69	-1.95	-0.78	-0.31	0.31	0.77	1.94

Notes: This table reports summary statistics for the bank-level data based on the OCCs annual report. Data are at annual frequency.

Table B.2: ***Summary Statistics: Bank-level Data from 1959 through 2023***

	N	Mean	Std. dev.	1st	10th	25th	75th	90th	99th
Failing bank	2,476,889	0.06	0.24	0.00	0.00	0.00	0.00	0.00	1.00
Equity/assets	2,476,851	0.10	0.07	0.04	0.06	0.07	0.11	0.14	0.35
Loans/assets	2,476,851	0.55	0.16	0.11	0.34	0.45	0.66	0.75	0.88
Deposits/assets	2,476,851	0.86	0.10	0.44	0.79	0.85	0.91	0.92	0.94
Liquid assets/assets	2,476,427	0.37	0.16	0.05	0.16	0.25	0.47	0.58	0.78
Loans/assets	2,476,851	0.55	0.16	0.11	0.34	0.45	0.66	0.75	0.88
Deposits/assets	2,476,851	0.86	0.10	0.44	0.79	0.85	0.91	0.92	0.94
Liquid assets/assets	2,476,427	0.37	0.16	0.05	0.16	0.25	0.47	0.58	0.78
Time deposits/assets	2,436,345	0.36	0.16	0.00	0.12	0.25	0.48	0.55	0.67
Wholesale funding/assets	2,476,850	0.01	0.04	0.00	0.00	0.00	0.00	0.04	0.18
Brokered deposits/assets	1,461,610	0.01	0.08	0.00	0.00	0.00	0.00	0.03	0.22
Net income/assets	1,910,708	0.01	0.01	-0.03	0.00	0.00	0.01	0.01	0.02
NPL/loans	1,354,217	0.02	0.03	0.00	0.00	0.00	0.02	0.04	0.12
LLP/loans	1,787,708	0.00	0.52	-0.00	0.00	0.00	0.00	0.01	0.04
NIM	1,905,796	0.01	0.02	-0.02	-0.00	0.00	0.02	0.03	0.05
3-year asset growth	2,138,777	0.14	0.31	-0.37	-0.11	-0.01	0.22	0.41	1.31

Notes: This table reports summary statistics for the bank-level data based the FFIEC Call Report. Net income, Loan Loss Provisions (LLP), and net interest income are based on annual, end-of-year data. All other variables are quarterly. The net interest margin is calculated as the ratio of net interest income over total assets.

Table B.3: ***Asset and Deposit Recovery Rates, 1863-1939***

Dependent variable	Asset recovery	Deposit recovery
	(1)	(2)
Good	0.78***	
	(0.01)	
Doubtful	0.45***	
	(0.01)	
Worthless	0.10***	
	(0.01)	
Asset recovery		1.13***
		(0.01)
Recovered form Shareholders		0.84***
		(0.12)
N	2617	2479
R^2	0.94	0.90

Notes: This table presents regressions explaining the asset recovery and deposit recovery rates. Each observation is a bank failure. Column (1) shows results from estimating the following regression:

$$\begin{aligned}\text{Total collected funds}_b =& \beta_1 \times \text{Assessed good}_b \\ &+\beta_2 \times \text{Assessed doubtful}_b \\ &+\beta_3 \times \text{Assessed worthless}_b + \epsilon_b,\end{aligned}$$

where all variables are normalized by total assets at the time of failure and all right-hand-side variables correspond to the assessment of the receiver in a failed bank.
Columns (2) shows results for estimating:

$$\begin{aligned}\frac{\text{Paid out to depositors}}{\text{Deposits at suspension}_b} =& \beta_1 \times \text{Total collected funds}_b + \\ & \beta_2 \times \text{Collected from Shareholders}_b + \epsilon_b,\end{aligned}$$

where Collected from Shareholders refers to the funds the receiver collects from shareholders after double liability is enforced. All right-hand-side variables are normalized by total assets at the time of failure. The sample covers failures from 1863 to 1939.

Table B.4: ***Loss Rates for Uninsured Depositors in Bank Failures: Pre-FDIC versus Post-FDIC***

Era	Number of failures	Share of failures with losses to depositors	Conditional loss rate	Unconditional loss rate
Panel A: Pre-FDIC				
1865-1913 (NB Era)	531	0.68	0.39	0.27
1914-1928 (Early Fed)	652	0.92	0.53	0.49
1929-1934 (Great Depression)	1710	0.82	0.40	0.32
All	2893	0.81	0.43	0.35
Panel B: Post-FDIC				
1992-2008	302	0.43	0.24	0.10
2008-2022	536	0.06	0.43	0.03
All	838	0.2	0.28	0.06

Notes: The loss rates reported in panel (A) are from the OCC's tables on national banks placed in receivership. The final loss rate for depositors does not account for interest payments or discounting. The data in panel (B) are as reported in FDIC (2023). The conditional loss rate is the loss rate for failures involving a loss for uninsured depositors.

Table B.5: ***Uninsured Depositor Loss Rates in Bank Failures by Cause of Failure***

Cause of Failure	Number of failures	Share of failures with losses to depositors	Conditional loss rate	Unconditional loss rate
Economic conditions	533	0.95	0.50	0.47
Excess. Lending	83	0.70	0.33	0.23
Fraud	330	0.76	0.42	0.32
Governance	226	0.94	0.47	0.44
Losses	344	0.68	0.47	0.32
Other	14	1.00	0.23	0.23
Run	28	0.64	0.46	0.30
Not classified	1335	0.79	0.38	0.30

Notes: The loss rates are from the OCC's tables on national banks placed in receivership for failures between 1863 and 1945. The final loss rate for depositors does not account for interest payments or discounting. The conditional loss rate is the loss rate for failures involving a loss for uninsured depositors.

Table B.6: ***Predicting Bank Failures: 1880-1904***

Horizon h	Fail in next year					3 years	5 years
Withdrawals before failure					>7.5%		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Solvency:							
- Surplus/Equity	-0.98***		-0.32*	-0.19	-0.01	-0.94***	-1.12***
	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
- Dividend Payout Restricted	2.25***		0.99***	0.92***	0.80***	2.06***	2.44***
	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Funding:							
- Wholesale Funding/Assets		18.50***	30.47***	29.70***	16.16***	59.84***	80.44***
		(0.01)	(0.02)	(0.02)	(0.01)	(0.03)	(0.03)
Solvency $\times$ ***Funding:***							
- Surplus/Equity $\times$ WF/Assets			-62.56***	-60.52***	-35.03***	-115.43***	-147.79***
			(0.05)	(0.05)	(0.04)	(0.08)	(0.10)
- Div. Restricted $\times$ WF/Assets			50.83***	51.44***	23.97***	49.70***	37.88***
			(0.03)	(0.03)	(0.02)	(0.04)	(0.06)
Bank Growth:							
- Q1 of Growth from t-3 to t				0.40***	0.20***	0.63***	0.56***
				(0.00)	(0.00)	(0.00)	(0.00)
- Q2 of Growth from t-3 to t				0.13*	0.04	0.06	-0.08
				(0.00)	(0.00)	(0.00)	(0.00)
- Q4 of Growth from t-3 to t				0.12*	0.05	0.14	0.21
				(0.00)	(0.00)	(0.00)	(0.00)
- Q5 of Growth from t-3 to t				0.04	-0.05	0.32**	0.53***
				(0.00)	(0.00)	(0.00)	(0.00)
Aggregate Conditions:							
- GDP Growth from t-3 to t				-0.78***	-0.52***	-2.09***	-1.67***
				(0.00)	(0.00)	(0.00)	(0.00)
N	73576	73576	73576	73392	73392	73392	73392
No of Banks	5291	5291	5291	5254	5254	5254	5254
Mean of dep. var.	.41	.41	.41	.4	.19	1.1	1.7

Notes: This table presents OLS estimates of (2) with failure between t and $t+h$ as the dependent variables for the 1880-1904 sample. In addition to the reported predictor variables, we also include the log of a bank's age. Standard errors in parentheses are clustered at the bank level; *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table B.7: ***Predicting Bank Failures: 1914-1928***

Horizon h	Fail in next year					3 years	5 years
Withdrawals before failure					>7.5%		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Solvency:							
- Surplus/Equity	-4.07***		0.47	0.94***	0.31	0.01	-2.45***
	(0.00)		(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
- Loans/Assets	0.57***		-0.36***	-0.35***	-0.20**	-0.86***	-1.38***
	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Funding:							
- Time Deposits/Assets		1.04***	2.90***	3.07***	1.29***	8.05***	13.27***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
- WF/Assets		7.00***	11.39***	11.87***	5.09***	24.06***	26.36***
		(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)
Solvency × Funding:							
- Surplus/Equity × Time Dep./Assets			-5.29***	-5.38***	-2.24***	-13.08***	-19.72***
			(0.01)	(0.01)	(0.00)	(0.01)	(0.02)
- Loans/Assets × Time Dep./Assets			1.12***	0.87**	0.50*	3.66***	8.30***
			(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
- Surplus/Equity × WF/Assets			-34.02***	-33.72***	-17.95***	-67.05***	-79.34***
			(0.01)	(0.01)	(0.01)	(0.03)	(0.04)
- Loans/Assets × WF/Assets			16.26***	15.74***	10.36***	37.07***	52.64***
			(0.01)	(0.01)	(0.01)	(0.02)	(0.03)
Bank Growth:							
- Q1 of Growth from t-3 to t				1.20***	0.68***	3.09***	3.86***
				(0.00)	(0.00)	(0.00)	(0.00)
- Q2 of Growth from t-3 to t				0.06	0.02	0.50***	0.64***
				(0.00)	(0.00)	(0.00)	(0.00)
- Q4 of Growth from t-3 to t				-0.08	-0.03	-0.31*	-0.76***
				(0.00)	(0.00)	(0.00)	(0.00)
- Q5 of Growth from t-3 to t				-0.16*	-0.10	-0.46***	-0.53**
				(0.00)	(0.00)	(0.00)	(0.00)
Aggregate Conditions:							
- GDP Growth from t-3 to t				-1.11***	-0.63***	-4.27***	-7.68***
				(0.00)	(0.00)	(0.00)	(0.00)
N	92254	92631	92254	91865	91865	91865	91865
No of Banks	9345	9345	9345	9324	9324	9324	9324
Mean of dep. var.	.64	.63	.64	.64	.34	2.5	5.6

Notes: This table presents OLS estimates of (2) with failure between t and $t + h$ as the dependent variables for the 1914-1928 sample. In addition to the reported predictor variables, we also include the log of a bank's age. In addition to the reported predictor variables, we also include the log of a bank's age. Standard errors in parentheses are clustered at the bank level; *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table B.8: ***Predicting Bank Failures: 1929-1934***

Horizon h	Fail in next year					3 years	5 years
Withdrawals before failure					>7.5%		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Solvency:							
- Equity/Assets	-9.42***		-10.63***	-14.21***	-7.68***	-42.79***	-53.46***
	(0.02)		(0.01)	(0.02)	(0.01)	(0.02)	(0.03)
- Surplus/Equity	-10.89***		-3.96***	-2.41***	-1.69***	-9.68***	-9.70***
	(0.01)		(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
- Dividend Payout Restricted	3.44***		2.14***	1.94***	0.97***	1.76***	0.87
	(0.00)		(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
- Loans/Assets	12.24***		4.80***	4.11***	2.99***	14.79***	19.32***
	(0.01)		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Funding:							
- Wholesale Funding/Assets		97.52***	170.92***	170.31***	96.60***	245.50***	243.95***
		(0.02)	(0.04)	(0.04)	(0.03)	(0.07)	(0.08)
Solvency $\times$ ***Funding:***							
- Surplus/Equity $\times$ WF/Assets			-230.17***	-228.94***	-129.14***	-216.25***	-181.79***
			(0.10)	(0.10)	(0.08)	(0.17)	(0.18)
Bank Growth:							
- Q1 of Growth from t-3 to t				2.78***	1.85***	4.18***	4.36***
				(0.00)	(0.00)	(0.01)	(0.01)
- Q2 of Growth from t-3 to t				0.57*	0.38	1.58***	1.68***
				(0.00)	(0.00)	(0.00)	(0.01)
- Q4 of Growth from t-3 to t				-0.75**	-0.47*	-1.95***	-2.15***
				(0.00)	(0.00)	(0.00)	(0.01)
- Q5 of Growth from t-3 to t				-0.74**	-0.25	-1.72***	-2.29***
				(0.00)	(0.00)	(0.00)	(0.01)
Aggregate Conditions:							
- GDP Growth from t-3 to t				0.53	2.87***	14.70***	30.09***
				(0.01)	(0.00)	(0.01)	(0.01)
N	32795	32818	32777	32702	32702	32702	32702
No of Banks	7429	7428	7428	7419	7419	7419	7419
Mean of dep. var.	3.5	3.5	3.5	3.5	2.1	9.8	12

Notes: This table presents OLS estimates of (2) with failure between t and $t+h$ as the dependent variables for the 1929-1934 sample. In addition to the reported predictor variables, we also include the log of a bank's age. Standard errors in parentheses are clustered at the bank level; *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table B.9: ***Predicting Bank Failures: 1959-2023***

Horizon h	Fail in next year					3 years	5 years
Withdrawals before failure					>7.5%		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Solvency:							
- Net Income/Assets	-53.03***		12.03***	12.63***	1.05***	19.89***	20.92***
	(0.00)		(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Funding:							
- Time Deposits/Deposits		2.18***	4.36***	4.40***	0.56***	10.41***	13.14***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Solvency $\times$ ***Funding:***							
- NI/Assets $\times$ TD/Dep.			-354.33***	-356.87***	-47.78***	-674.32***	-719.49***
			(0.02)	(0.02)	(0.01)	(0.03)	(0.04)
Bank Growth:							
- Q1 of Growth from t-3 to t				0.07***	-0.01	0.27***	0.44***
				(0.00)	(0.00)	(0.00)	(0.00)
- Q2 of Growth from t-3 to t				-0.06***	-0.00	-0.15***	-0.18***
				(0.00)	(0.00)	(0.00)	(0.00)
- Q4 of Growth from t-3 to t				0.03*	0.01	0.15***	0.29***
				(0.00)	(0.00)	(0.00)	(0.00)
- Q5 of Growth from t-3 to t				0.02	0.01	0.54***	1.32***
				(0.00)	(0.00)	(0.00)	(0.00)
Aggregate Conditions:							
- GDP Growth from t-3 to t				-0.06	0.57***	0.24*	2.04***
				(0.00)	(0.00)	(0.00)	(0.00)
N	616046	614680	614680	604764	209731	604764	604764
No of Banks	22155	22152	22152	22127	14432	22127	22127
Mean of dep. var.	.26	.26	.26	.27	.035	.88	1.4

Notes: This table presents OLS estimates of (2) with failure between t and $t + h$ as the dependent variables for the 1959-2023 sample. In addition to the reported predictor variables, we also include the log of a bank's age. The sample in column (5) is restricted to the years from 1993-2023 due to unavailability to deposits in failure before 1993. Standard errors in parentheses are clustered at the bank level; *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table B.10: *Predictability of Failures By Era and During Major Banking Crises*

Panel A: 1865-1935						
	1890	1893	1890-1896	1930-1933	1929-1931	1932-1933
AUC	0.876	0.830	0.810	0.793	0.796	0.864
Panel B: 1959-2023						
	1959-1981	1982-1994	1994-2006	2007-2023	1984-1990	2007-2013
AUC	0.887	0.945	0.866	0.952	0.943	0.949

Notes: This table reports the area under the receiver operating characteristic curve (AUC) by sample period. In the first three columns of Panel A, we use in-sample predictions based on the estimation using data from 1889 through 1904 that corresponds to column (4) of Table B.6. In the last three columns of panel A, we use in-sample predictions based on the estimation using data from 1929-1935 in column (4) of Table B.8. In Panel B, we calculate the AUC based on the predictions obtained from the model in column (4) of Table B.9.

Table B.11: *Net Asset Growth in Failing Banks Before and After the FDIC*

Era	Average	Share of failures with asset growth falling within...					
		<-30%	[-30%,-20%]	[-20%,-7.5%]	[-7.5%,-2.5%]	[-2.5%,0%]	>0
Panel A: Pre versus Post-FDIC							
1880-1934 (Pre-FDIC)	-19.15	0.18	0.22	0.40	0.10	0.03	0.07
1993-2023 (Post-FDIC)	0.66	0.01	0.01	0.08	0.12	0.21	0.57
Panel B: By Era							
1880-1913 (NB Era)	-21.56	0.28	0.23	0.30	0.07	0.02	0.09
1914-1918 (Early Fed)	-20.15	0.19	0.21	0.43	0.10	0.02	0.06
1929-1933 (Depr., pre-Hld.)	-23.35	0.20	0.28	0.42	0.07	0.01	0.02
1933-1934 (Depr., post-Hld.)	-3.29	0.01	0.06	0.40	0.22	0.10	0.22
1993-2006	-1.06	0.03	0.02	0.19	0.09	0.37	0.28
2007-2023	1.00	0.00	0.00	0.06	0.13	0.18	0.62

Notes: This table reports the percent change between nominal asssts in the last call report before failure and the assets reported in failure. Before 1935, assets in failure are as reported in the OCC annual reports table on national banks in receivership. This records assets "at date of suspension." After 1935, we use assets as reported in the FDIC's list of failing banks.

Table B.12: ***Fundamentals Predict Aggregate Rate of Bank Failures: Robustness to Model Selection***

Dependent variable	Aggregate Failure Rate			
	(1)	(2)	(3)	(4)
Predicted failure rate, $\overline{p}_{t\|t-1}$	2.82***	2.68***	1.72***	1.06***
	(0.87)	(0.28)	(0.29)	(0.10)
Constant	-0.18	-0.12*	-0.11	0.09**
	(0.17)	(0.06)	(0.08)	(0.04)
N	102	102	102	100
R^2	.35	.64	.61	.72
Table 2 model	(1)	(2)	(3)	(4)
Sample	Full	Full	Full	Full

Notes: This table presents time series regressions of the annual aggregate failure rate in year t on the predicted aggregate failure rate $\overline{p}_t$. The predicted aggregate failure rate in each column is based on the model from that column in Table 2. The time series model is estimated on the full sample. Robust standard errors in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

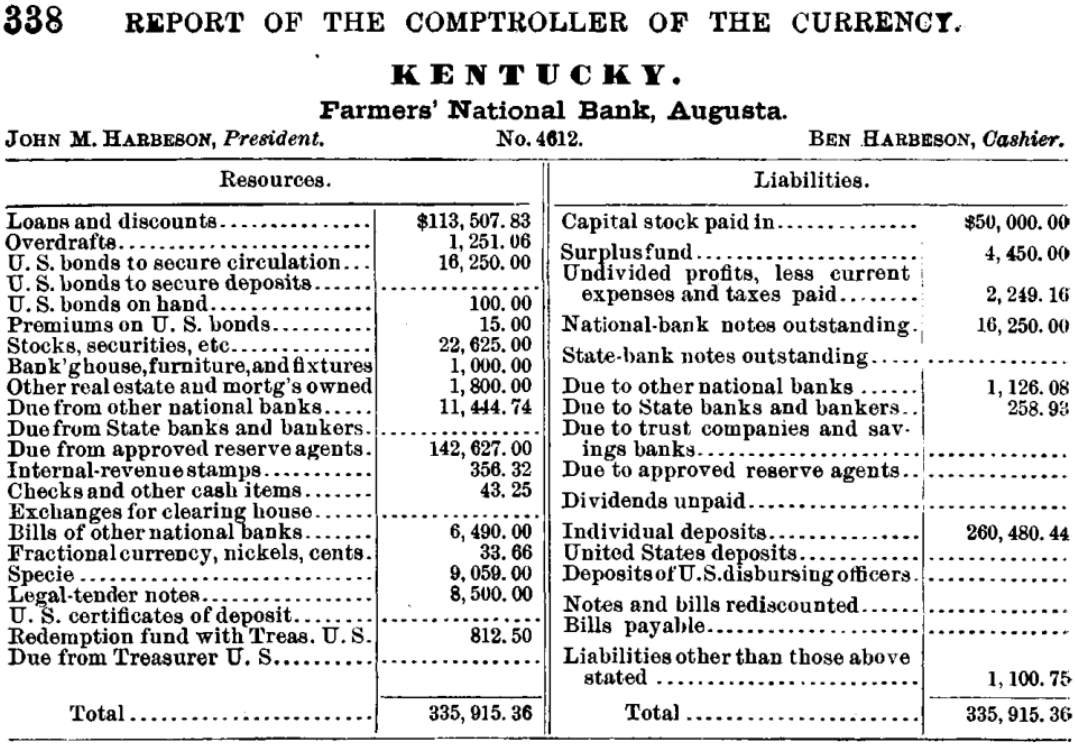
C Data Appendix

C.1 Appendix B1: Call Reports

OCC Annual Report to Congress: 1863 through 1941 We use two main data sources on bank balance sheets. Data on national bank balance sheets from 1863 through 1941 are from the Office of the Comptroller of the Currency's (OCC) Annual Report to Congress.

Note that the format of the tables changes in 1905. Starting in 1905, balance sheets for multiple banks are reported in tables that go across two pages. Figure C.2 shows an example of the format after 1905 form the annual report to congress of 1933. We digitze these data also using the techniques discussed in Correia and Luck (2023).

Figure C.1: *Example of a Balance Sheet Reported in the OCC's Annual Report to Congress from 1900.*



338 REPORT OF THE COMPTROLLER OF THE CURRENCY.

KENTUCKY.

Farmers' National Bank, Augusta.

JOHN M. HARBESON, *President.* No. 4612. BEN HARBESON, *Cashier.*

Resources.		Liabilities.	
Loans and discounts	$113,507.83	Capital stock paid in	$50,000.00
Overdrafts	1,251.06	Surplus fund	4,450.00
U. S. bonds to secure circulation	16,250.00	Undivided profits, less current expenses and taxes paid	2,249.16
U. S. bonds to secure deposits		National-bank notes outstanding	16,250.00
U. S. bonds on hand	100.00	State-bank notes outstanding	
Premiums on U. S. bonds	15.00	Due to other national banks	1,126.08
Stocks, securities, etc	22,625.00	Due to State banks and bankers	258.93
Bank'g house, furniture, and fixtures	1,000.00	Due to trust companies and savings banks	
Other real estate and mortg's owned	1,800.00	Due to approved reserve agents	
Due from other national banks	11,444.74	Dividends unpaid	
Due from State banks and bankers		Individual deposits	260,480.44
Due from approved reserve agents	142,627.00	United States deposits	
Internal-revenue stamps	356.32	Deposits of U.S. disbursing officers	
Checks and other cash items	43.25	Notes and bills rediscounted	
Exchanges for clearing house		Bills payable	
Bills of other national banks	6,490.00	Liabilities other than those above stated	1,100.75
Fractional currency, nickels, cents	33.66		
Specie	9,059.00		
Legal-tender notes	8,500.00		
U. S. certificates of deposit			
Redemption fund with Treas. U. S.	812.50		
Due from Treasurer U. S.			
Total	335,915.36	Total	335,915.36

Figure C.2: *Example of a Balance Sheet Reported in the OCC's Annual Report to Congress from 1933.*

Assets and liabilities of national banks as shown by reports of condition December 30, 1933—Continued

ILLINOIS—Continued

DISTRICT NO. 8—Continued

	Location and name of bank	President	Cashier	Loans and discounts, including overdrafts	United States Government securities owned	Other bonds, stocks, and securities, etc., owned
1	National City, National Stock Yards.	O. J. Sullivan	R. D. Garvin	$3,664,806	$6,532,834	$733,004
2	New Douglas, Prange	A. F. Prange	W. W. Prange	107,457	50,000	64,219
3	Oblong, First	S. F. Odell	J. B. McKnight	786,318	83,500	208,704
4	O'Fallon, First	E. H. Smiley	W. R. Dorris	296,662	174,207	484,832
5	Okawville, First	W. G. Frank	W. E. Friend	151,758	79,547	307,394
6	Okawville, Old Exchange	C. H. Merrick	F. Moehle	88,300	76,675	216,049
7	Pittsfield, First	L. C. King	F. A. Hicks	650,876	251,425	166,315
8	Ramsey, Ramsey	L. C. Thiele	J. E. Easterday	137,655	51,250	43,077
9	Raymond, First	J. E. McDavid	C. McNaughton	431,989	35,588	116,659
10	Robinson, Second	A. U. McCandless	A. H. Lodge	1,190,820	485,556	327,905
11	St. Francisville, Peoples	S. Gray	G. H. Corrie	170,068	107,500	110,128
12	Salem, Salem	J. C. Martin	A. H. Bachman	353,021	968,786	1,324,844
13	Sandoval, First	B. F. Holmes	H. H. Bellamy	58,831	45,710	28,768
14	Smithton, First	J. A. Miller	E. P. Baltz	113,288	59,881	80,845
15	Sorento, National	L. C. Dreiling	H. H. Holbrook	10,902		9,491
16	Sparta, First	T. B. Stephenson	P. G. Brown	168,354	95,550	53,236
17	Staunton, Staunton	C. F. Hackman	J. W. P. Kerr	85,469	82,293	237,000
18	Sumner, First	G. W. Hill	O. D. Atkins	38,933	59,787	148,707
19	Vandalia, First	F. L. Rice	R. H. Sturgess	234,469	428,738	170,332
20	Vienna, First	W. L. Williams	F. E. Worrell	213,432	100,181	33,951
21	Waterloo, First	N. B. Pautler	J. F. Schmidt	172,706	223,338	136,773
22	Wayne City, First	J. F. Mateer	W. O. Allen	88,400	52,700	33,908
23	White Hall, White Hall	C. A. Ruckel	R. S. Worcester	371,118	206,083	188,280
24	Witt, Security	H. F. Fesser	H. S. Armentrout	121,245	64,346	138,243
25	Woodlawn, First	E. A. Hill	M. Wood	68,828	47,522	44,461
26	Wood River, First	O. F. Nagel	G. G. Guker	237,024	92,269	170,906
27	Wood River, Wood River	J. M. Olin	H. E. Paton	261,407		55,577
28	Worden, First	T. C. Unger	W. E. Meyer	33,797	33,308	10,941
29	Xenia, First	J. M. Tully	E. Kepp	99,489	34,000	1,169
30	Zeigler, First	F. G. Hitt	R. R. Frazier	49,690	396,574	220,202

ILLINOIS—Continued

DISTRICT NO. 8—Continued

	Cash and exchange including reserve with Federal Reserve bank	Other assets	Total assets	Capital	Surplus	Undivided profits	Total deposits	Circulation	Bills payable and rediscounts	Other liabilities
1	$3,678,840	$123,007	$14,732,491	$750,000	$150,000	$45,440	$12,983,612	$750,000		$53,439
2	16,019	4,386	242,081	25,000	10,000	837	206,244			
3	210,440	76,380	1,365,342	75,000	50,000	21,563	1,144,859	73,860		60
4	183,751	75,195	1,214,647	100,000	30,000	4,676	979,939	100,000		32
5	44,503	5,173	588,375	50,000	10,000	7,526	470,830	50,000		19
6	67,929	4,889	453,842	50,000	10,000	14,951	328,891	50,000		
7	206,835	113,931	1,389,382	125,000	125,000	41,325	998,602	99,280		175
8	68,692	14,762	315,436	25,000	25,000	7,675	232,761	25,000		
9	34,659	41,646	660,541	50,000	10,000	763	494,282	25,000	$80,496	
10	432,586	67,348	2,504,215	150,000	37,500	33,989	2,188,976	93,750		
11	34,200	19,456	441,352	70,000	10,000	5,723	305,624	50,000		5
12	360,591	71,420	3,078,662	100,000	24,000	56,830	2,822,645	75,000		187
13	49,091	24,437	206,837	40,000	2,500	1,301	138,354	24,640		42
14	25,757	16,668	296,439	25,000	8,000	350	238,032	25,000		57
15	30,302	5,532	56,227	25,000	1,850	(d) 7,631	33,982		3,000	26
16	178,157	30,215	525,512	50,000	25,000	11,078	389,401	50,000		33
17	64,862	15,841	455,463	50,000	10,000	26,387	349,032	50,000		46
18	81,973	8,685	338,085	25,000	5,000	674	281,707	25,000		704
19	202,269	68,789	1,104,597	100,000	25,000	19,369	860,078	100,000		150
20	57,696	59,123	464,383	60,000	25,000	2,812	317,130	59,340		101
21	100,669	6,356	639,872	25,000	15,000	1,437	573,435	25,000		
22	35,121	33,126	243,253	45,000		1,436	171,768	25,000		51
23	121,473	16,158	903,112	100,000	20,000	29,480	703,632	50,000		
24	27,591	7,947	359,372	25,000	5,000	5,248	299,124	25,000		
25	95,669	9,520	266,000	35,000	2,000	3,282	200,718	25,000		
26	123,661	50,285	674,145	50,000	50,000	2,571	521,416	50,000		158
27	129,894	69,034	515,912	60,000	30,000	10,786	415,126			
28	18,348	11,710	113,104	25,000	5,000	194	57,912	24,998		
29	52,560	14,866	202,084	25,000		1,082	150,963	25,000		39
30	116,201	46,553	829,220	35,000	7,000	23,940	729,280	34,000		

C.1.1 FFIEC 010 and FFIEC 013: 1959 through 2023

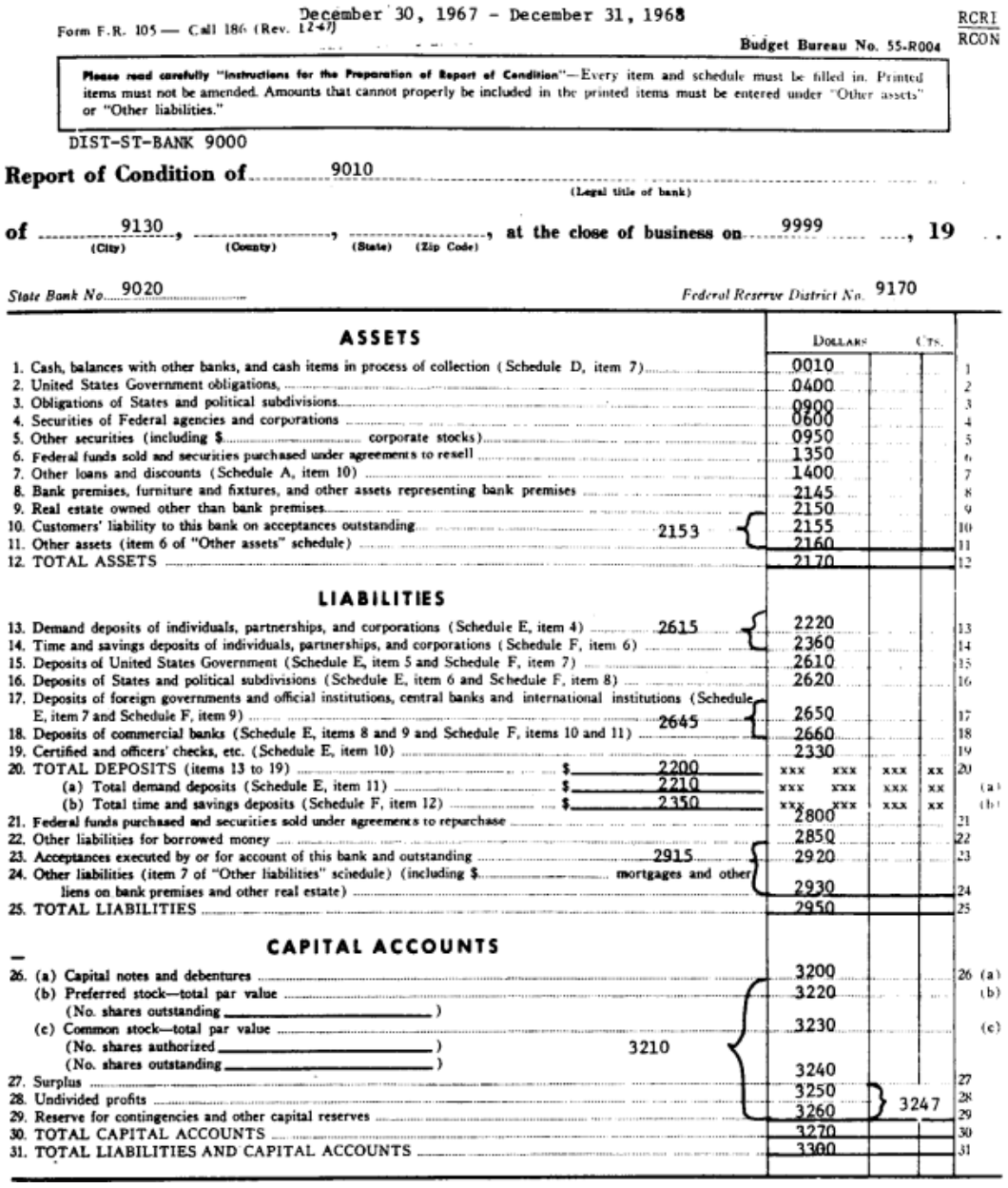
For the modern, contemporary banking system, we use the Federal Financial Institutions Examination Council (FFIEC) Consolidated Reports of Condition and Income ("Call Report"). These data provide quarterly information on balance sheets (FFIEC010) and income statements (FFFIEC013) on a consolidated basis for all commercial banks operating in the United States and regulated by the FRS, the FDIC, and the OCC. Figure C.3 shows an example of the balance sheet reporting form used in 1967. Figure C.4 shows an example of the income statement reporting form of the same year.

We document the construction of our variables from the various line items in table Table C.1.

Table C.1: ***Definitions of FFIEC 010 and 013 line items.***

Item	Series	Item Number	Valid Period
Assets	RCON	2170	1959–12–31 to present
Equity	RCON	3210	1959–12–31 to present
Deposits	RCON	2200	1959–12–31 to present
Loans	RCON	1400	1959–12–31 to present
		2122	1976–03–31 to present
Cash	RCON	0010	1959–12–31 to present
Securities	RCON	0400 + 0600 + 0900 + 0950	1959–06–10 to 1976–03–31
		0390	1976–03–31 to 1993–12–31
		1754 + 1773	1994–03–31 to present
C&I loans	RCON	1600	1959–12–31 to 1984–03–31
		1766	1984–03–31 to present
Real Estate Loans	RCON	1410	1959–12–31 to present
Consumer Loans	RCON	1975	1959–12–31 to present
Credit Card Loans	RCON	2008	1967–12–31 to 2000–12–31
		B538	2001–03–31 to present
Financial Loans	RCON	1495	1959–06–10 to 1983–12–31
		1505 + 1510 + 1517 + 1756 +1757	1976–03–31 to 2000–12–31
		B531 + B534 + B535	2001–03–31 to present
Time Deposits	RCON	2514	1961–04–12 to 1983–12–31
	RCON	2604 + 6648	1984–03–31 to 2009–12–31
	RCON	J473 + J474 + 6648	2010–03–31 to present
Demand Deposits	RCON	2210	1959–12–31 to present
Brokered Deposits	RCON	2365	1983–09–30 to present
Insured Deposits	RCON	2702	1983–06–30 to 2006–03–31
	RCON	F045 + F049	2006–06–30 to present
Uninsured Deposits	RCON	2710 - (2722*100)	1983–06–30 to 1992–12–31
	RCON	5597	1993–03–31 to present
Loan Loss Provisions	RIAD	4230	1969–12–31 to present
Net Income	IADX	5106	1960–12–31 to 1968–12–31
	RIAD	4340	1969–12–31 to present
Non-Performing Loans	RCON	1403 + 1407	1982–12–31 to present
Total Interest Income	RIAD	4107	1984–03–31 to present
Total Interest Expenses	RIAD	4170 + 4180 + 4190 + 4200	1969–12–31 to 1978–09–30
	RIAD	4170 + 4180 + 4185 + 4200	1978–12–31 to 1983–12–31
	RIAD	4073	1984–03–31 to present
Salaries and Employee Benefits	RIAD	4135	1969–12–31 to present
Number of Full-Time Employees	RIAD	4150	1969–12–31 to present

Figure C.3: *Example of FFIEC 010 Reporting Form from 1967.*



Form F.R. 105 — Call 186 (Rev. 12-67) December 30, 1967 - December 31, 1968

Budget Bureau No. 55-R004

RCRI
RCON

Please read carefully "Instructions for the Preparation of Report of Condition"—Every item and schedule must be filled in. Printed items must not be amended. Amounts that cannot properly be included in the printed items must be entered under "Other assets" or "Other liabilities."

DIST-ST-BANK 9000

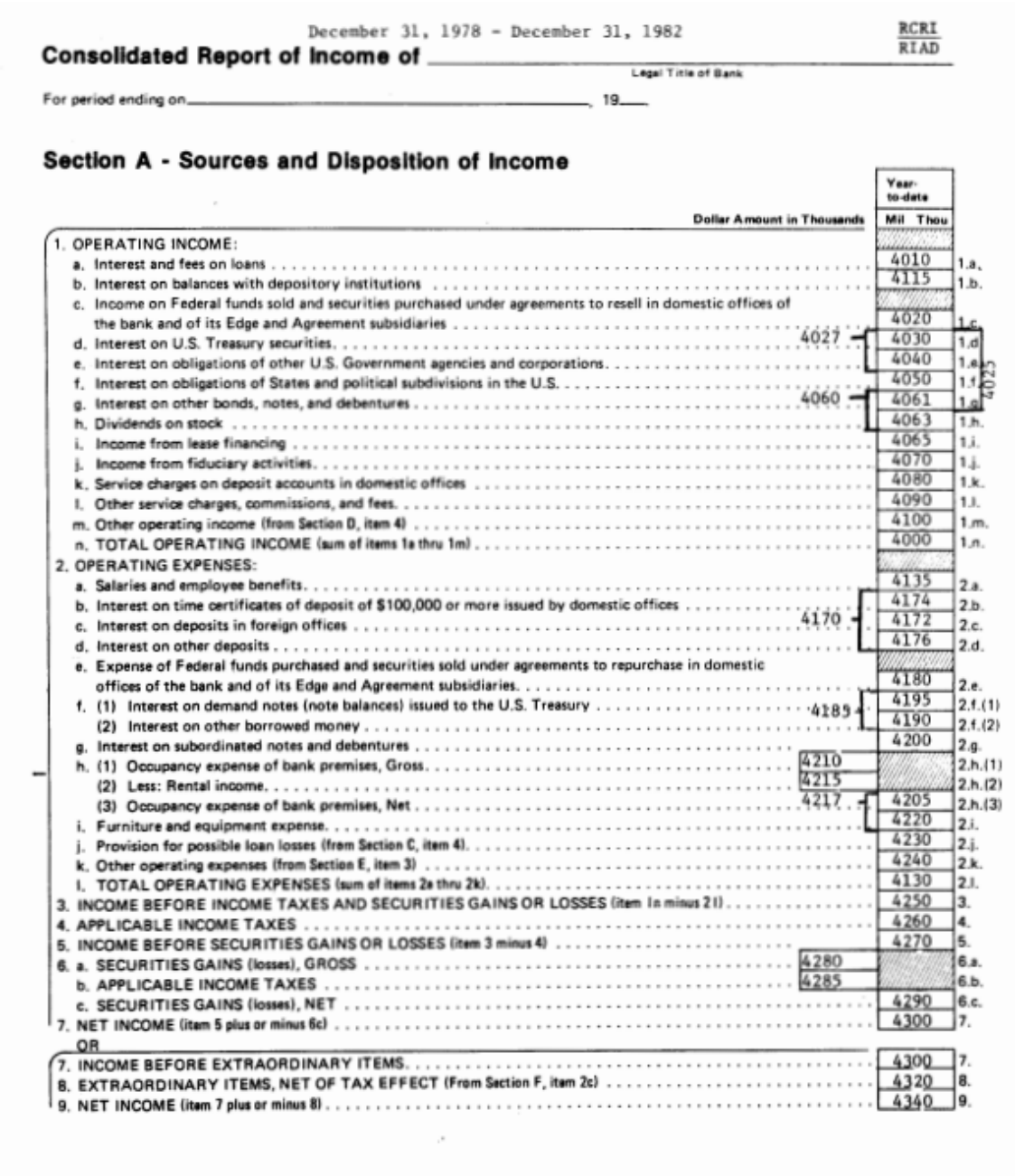
Report of Condition of 9010
(Legal title of bank)

of 9130 (City), (County), (State) (Zip Code), **at the close of business on** 9999, **19**

State Bank No. 9020 *Federal Reserve District No.* 9170

		Dollars	Cts.	
ASSETS				
1. Cash, balances with other banks, and cash items in process of collection (Schedule D, item 7)	0010			1
2. United States Government obligations	0400			2
3. Obligations of States and political subdivisions	0900			3
4. Securities of Federal agencies and corporations	0600			4
5. Other securities (including $ corporate stocks)	0950			5
6. Federal funds sold and securities purchased under agreements to resell	1350			6
7. Other loans and discounts (Schedule A, item 10)	1400			7
8. Bank premises, furniture and fixtures, and other assets representing bank premises	2145			8
9. Real estate owned other than bank premises	2150			9
10. Customers' liability to this bank on acceptances outstanding 2153	2155			10
11. Other assets (item 6 of "Other assets" schedule)	2160			11
12. TOTAL ASSETS	2170			12
LIABILITIES				
13. Demand deposits of individuals, partnerships, and corporations (Schedule E, item 4) 2615	2220			13
14. Time and savings deposits of individuals, partnerships, and corporations (Schedule F, item 6)	2360			14
15. Deposits of United States Government (Schedule E, item 5 and Schedule F, item 7)	2610			15
16. Deposits of States and political subdivisions (Schedule E, item 6 and Schedule F, item 8)	2620			16
17. Deposits of foreign governments and official institutions, central banks and international institutions (Schedule E, item 7 and Schedule F, item 9) 2645	2650			17
18. Deposits of commercial banks (Schedule E, items 8 and 9 and Schedule F, items 10 and 11)	2660			18
19. Certified and officers' checks, etc. (Schedule E, item 10)	2330			19
20. TOTAL DEPOSITS (items 13 to 19) $ 2200	xxx	xxx	xxx xx	20
(a) Total demand deposits (Schedule E, item 11) $ 2210	xxx	xxx	xxx xx	(a)
(b) Total time and savings deposits (Schedule F, item 12) $ 2350	xxx	xxx	xxx xx	(b)
21. Federal funds purchased and securities sold under agreements to repurchase	2800			21
22. Other liabilities for borrowed money	2850			22
23. Acceptances executed by or for account of this bank and outstanding 2915	2920			23
24. Other liabilities (item 7 of "Other liabilities" schedule) (including $ mortgages and other liens on bank premises and other real estate)	2930			24
25. TOTAL LIABILITIES	2950			25
CAPITAL ACCOUNTS				
26. (a) Capital notes and debentures	3200			26 (a)
(b) Preferred stock—total par value	3220			(b)
(No. shares outstanding)				
(c) Common stock—total par value	3230			(c)
(No. shares authorized) 3210				
(No. shares outstanding)	3240			
27. Surplus	3250			27
28. Undivided profits	3260	3247		28
29. Reserve for contingencies and other capital reserves				29
30. TOTAL CAPITAL ACCOUNTS	3270			30
31. TOTAL LIABILITIES AND CAPITAL ACCOUNTS	3300			31

Figure C.4: *Example of FFIEC 013 Reporting Form from 1967.*



December 31, 1978 - December 31, 1982 RCRI RIAD

Consolidated Report of Income of _____
Legal Title of Bank

For period ending on _____, 19__

Section A - Sources and Disposition of Income

Dollar Amount in Thousands		Year-to-date Mil Thou	
1. OPERATING INCOME:			
a. Interest and fees on loans		4010	1.a.
b. Interest on balances with depository institutions		4115	1.b.
c. Income on Federal funds sold and securities purchased under agreements to resell in domestic offices of the bank and of its Edge and Agreement subsidiaries		4020	1.c.
d. Interest on U.S. Treasury securities	4027	4030	1.d.
e. Interest on obligations of other U.S. Government agencies and corporations		4040	1.e.
f. Interest on obligations of States and political subdivisions in the U.S.		4050	1.f.
g. Interest on other bonds, notes, and debentures	4060	4061	1.g.
h. Dividends on stock		4063	1.h.
i. Income from lease financing		4065	1.i.
j. Income from fiduciary activities		4070	1.j.
k. Service charges on deposit accounts in domestic offices		4080	1.k.
l. Other service charges, commissions, and fees		4090	1.l.
m. Other operating income (from Section D, item 4)		4100	1.m.
n. TOTAL OPERATING INCOME (sum of items 1a thru 1m)		4000	1.n.
2. OPERATING EXPENSES:			
a. Salaries and employee benefits		4135	2.a.
b. Interest on time certificates of deposit of $100,000 or more issued by domestic offices		4174	2.b.
c. Interest on deposits in foreign offices	4170	4172	2.c.
d. Interest on other deposits		4176	2.d.
e. Expense of Federal funds purchased and securities sold under agreements to repurchase in domestic offices of the bank and of its Edge and Agreement subsidiaries		4180	2.e.
f. (1) Interest on demand notes (note balances) issued to the U.S. Treasury	4189	4195	2.f.(1)
(2) Interest on other borrowed money		4190	2.f.(2)
g. Interest on subordinated notes and debentures		4200	2.g.
h. (1) Occupancy expense of bank premises, Gross	4210		2.h.(1)
(2) Less: Rental income	4215		2.h.(2)
(3) Occupancy expense of bank premises, Net	4217	4205	2.h.(3)
i. Furniture and equipment expense		4220	2.i.
j. Provision for possible loan losses (from Section C, item 4)		4230	2.j.
k. Other operating expenses (from Section E, item 3)		4240	2.k.
l. TOTAL OPERATING EXPENSES (sum of items 2a thru 2k)		4130	2.l.
3. INCOME BEFORE INCOME TAXES AND SECURITIES GAINS OR LOSSES (item 1n minus 2l)		4250	3.
4. APPLICABLE INCOME TAXES		4260	4.
5. INCOME BEFORE SECURITIES GAINS OR LOSSES (item 3 minus 4)		4270	5.
6. a. SECURITIES GAINS (losses), GROSS	4280		6.a.
b. APPLICABLE INCOME TAXES	4285		6.b.
c. SECURITIES GAINS (losses), NET		4290	6.c.
7. NET INCOME (item 5 plus or minus 6c)		4300	7.
OR			
7. INCOME BEFORE EXTRAORDINARY ITEMS		4300	7.
8. EXTRAORDINARY ITEMS, NET OF TAX EFFECT (From Section F, item 2c)		4320	8.
9. NET INCOME (item 7 plus or minus 8)		4340	9.

4025

C.2 Data on National Bank Receiverships

We digitize an extensive set of tables with information on national banks in charge of receivers from the OCC's Annual Report to Congress from each year between 1920 to 1939. The 1920 OCC Annual Report contains information on all receiverships from the first receivership in 1865 until receiverships initiated in August 1920. We further digitize the tables on receiverships for each year from 1921 to 1939 to record information on receiverships initiated after 1920, as well as receiverships initiated before 1920 but terminated after 1920.

These data contain a range of information, including the date the receiver was appointed; the date the bank was finally closed; deposits at suspension; assets at suspension; an estimate of the breakdown of assets at suspension by good, doubtful, or worthless assets; additional assets received after the date of suspension; total collections from assets; total collections from shareholder assessments; dividends paid to claim holders; and legal expenses. The data on deposits outstanding at the time of suspension are available starting in 1880. These tables also contain the OCC's assessment of the cause of failure.

From this information, we calculate the recovery rate on assets as the amount collected from assets divided by the sum of assets at suspension and assets received after suspension. For the depositor recovery rate, we use the dividends paid (in %), reported by the the OCC. This reflects the dividends paid relative to the amount of claims proved. The depositor recovery rate does not include interest or account for the time value of money. Figure B.3 shows that the depositor recovery in the first year amounts to only about half of the final recovery.

Causes of Failures as Classified By the OCC From 1863 to 1928, the OCC classified the "apparent cause of failure" for almost all bank failures. For 1929, 1930, and 1931, the OCC classified the cause of failure for 78%, 75%, and 48% of failures, respectively. The OCC did not classify the cause of failure for failures occurring in 1932 and 1933. However, we were able to obtain the cause of failure for 12 failures from 1934-1937 from the OCC's 1937 Annual Report to Congress. See Figure C.5 for the share of failures not classified by year.

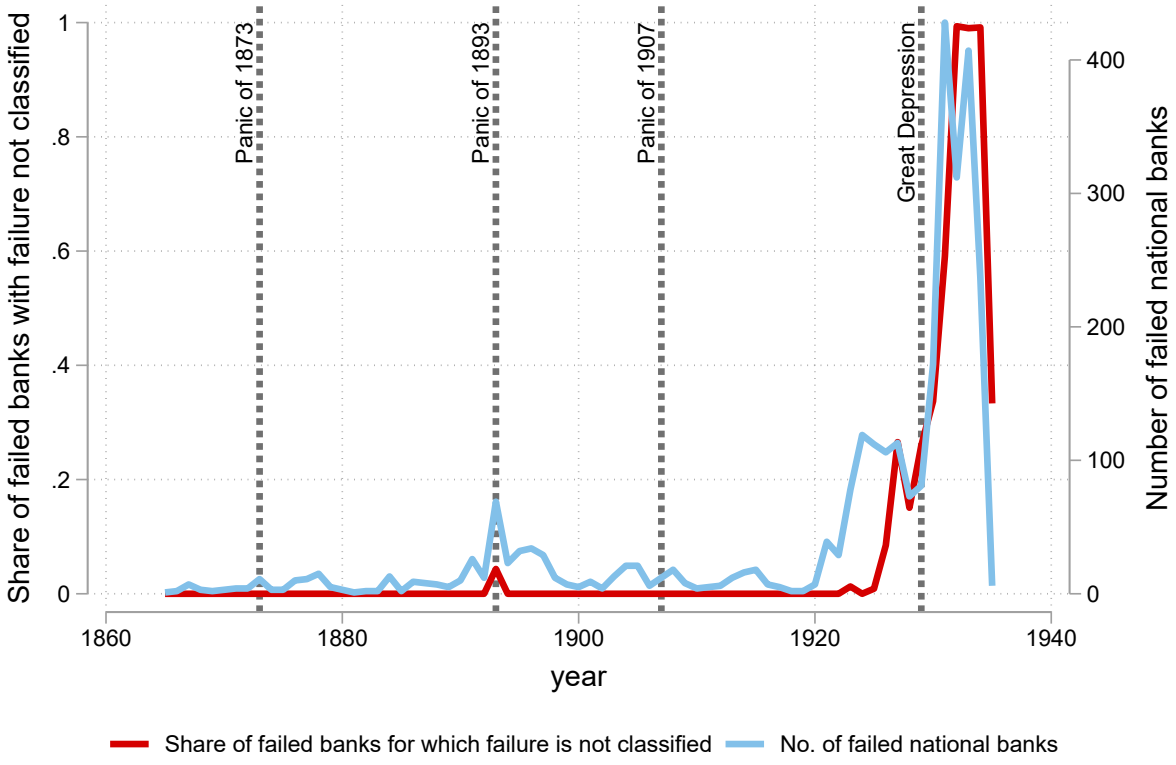
We group the detailed cause of failure classifications from the OCC into one of the following broad categories:

- **Excessive lending:** Excessive lending refers to a bank lending more than 10% of its paid-in capital to a single counterparty, which was not permitted by the national banking act.
- **Economic conditions:** We classify failure as caused by external economic factors whenever the OCC cited the trigger of failure being related to things outside of a banks control such as crop losses, a deterioration of local economic conditions, robbery, or other shocks.
- **Fraud:** We classify a failure as due to fraud when the OCC cited misbehavior from bankers as the cause of failure. Fraud can be related to dishonesty of a bank employee or owner and excessive loans to insiders.

- **Governance:** We classify a failure being due to governance issues if bad management practices are cited as the cause of failure
- **Losses:** We refer to the cause of failure being due to losses when the bank is subject to losses or unable to realize on assets, injudicious banking practices, or depleted reserves.
- **Run:** We classify a run as being the cause of failure when the OCC reports the bank was closed by a run or anticipation of a run or heavy withdrawals.

Table C.2 shows the detailed mappings.

Figure C.5: ***Classification of causes of failure by the OCC across time.***



Notes: This figure shows the share of failed national banks for which the OCC did not provide a cause of failure (left y-axis) and the number of failed national banks (right y-axis) from 1863 through 1935.

Table C.2: ***OCC Causes of Failure Classification.***

OCC Cause of Failure	*Simplified Label*
Crop loss and depreciation of securities	Economic conditions
Crop loss	Economic conditions
Deflation	Economic conditions
Local financial conditions	Economic conditions
Local financial depression from unforeseen agricultural or industrial disaster	Economic conditions
Excessive loans and failure of large debtors	Excessive lending
Excessive loans to officers and directors	Excessive lending
Excessive loans to others and depreciation of securities	Excessive lending
Excessive loans to others and investments in real estate and mortgages	Excessive lending
Excessive loans to others, injudicious banking, and depreciation of securities	Excessive lending
Excessive loans	Excessive lending
Failure of large debtors	Excessive lending
Defalcation by cashier	Fraud
Defalcation by former cashier	Fraud
Defalcation of officers and depreciation of securities	Fraud
Defalcation of officers and excessive loans to others	Fraud
Defalcation of officers and fraudulent management	Fraud
Defalcation of officers	Fraud
Dishonesty of an officier of employee and local financial depression from unforeseen agricultural or industrial disaster	Fraud
Dishonesty of an officier of employee	Fraud
Dishonesty	Fraud
Excessive loans to officers and directors and depreciation of securities	Fraud
Excessive loans to officers and directors and investments in real estate and mortgages	Fraud
Forgeries and embezzlement	Fraud
Fraudulent management	Fraud
Fraudulent management and closed by run	Fraud
Fraudulent management and depreciation of securities	Fraud
Fraudulent management and injudicious banking	Fraud
Fraudulent management and local financial conditions	Fraud
Fraudulent management, defalcation of officers, and depreciation of securities	Fraud
Fraudulent management, excessive loans to officers and directors, and depreciation of securities	Fraud
Fraudulent management, excessive loans to officers and directors, and excessive loans to others	Fraud
Fraudulent management, injudicious banking, investments in real estate and mortgages, and depreciation of securities	Fraud
Fraudulent management	Fraud

Irregularities of president and speculation in real estate	Fraud
Irregularities	Fraud
Wrecked by assistant cashier	Fraud
Wrecked by cashier and president and by excessive loans to themselves	Fraud
Wrecked by defalcation by bookkeeper	Fraud
Wrecked by president	Fraud
Wrecked by the cashier	Fraud
Bad management	Governance
Incompetent management and dishonesty of an officier of employee	Governance
Incompetent management and local financial depression from unforeseen agricultural or industrial disaster	Governance
Incompetent management	Governance
Bad paper taken over from old organization	Losses
Bad paper	Losses
Deficient reserve and unable to realize on loans	Losses
Depleted reserve	Losses
Depleted reserve and shrinkage of deposits	Losses
Depreciation of securities	Losses
Formerly in voluntary liquidation	Losses
General stringency of the money market, shrinkage in values, and imprudent methods of banking	Losses
Injudicious banking and adverse business conditions	Losses
Injudicious banking and depreciation of securities	Losses
Injudicious banking and excessive loans to officers and others	Losses
Injudicious banking and failure of large debtors	Losses
Injudicious banking	Losses
Insufficient credit	Losses
Investment in real estate mortgages and depreciation of securities	Losses
Investments in real estate and mortgages and depreciation of securities	Losses
Large losses and defalcation	Losses
Large losses and injudicious banking	Losses
Large losses in loans and discounts	Losses
Large losses, withdrawals, and insufficient credit	Losses
Large losses	Losses
Receiver appointed after sale of assets, and stockholders to vote to place bank in liquidation	Losses
Receiver appointed after voluntary liquidation	Losses
Receiver appointed to assess stockholders	Losses
Receiver appointed to levy and collect stock assessment covering deficiency in value of assets sold, or to complete unfinished liquidation	Losses
Receiver appointed to levy and collect stock assessment covering deficiency in value of assets sold	Losses
Unable to realize on assets	Losses
Unable to realize on loans and failure of stockholders to pay balance due on capital	Losses

Unable to realize on loans	Losses
Information not available	No information
Robbery and burning of bank	Other
Temporary suspension	Other
Temporary suspension to adjust settlement on adverse judgment	Other
Closed by directors in anticipation of run	Run
Closed by run	Run
Directors closed due to rumor of run	Run
Heavy withdrawals and lack of public confidence	Run
Heavy withdrawals	Run
Inability to meet demands	Run
Large demands and depleted cash	Run
Local financial conditions and closed by run	Run