Were There Other Ways Out?
Bank Failures During the Panics of the Great Depression

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This paper tests whether the banking panics of the Great Depression caused banks to fail that otherwise would not have. Unlike pervious work, which has generally assumed that a bank would either fail or survive, this paper examines whether panics prevented troubled banks from pursuing alternative and less disruptive resolution strategies such as merging with another bank or suspending and reorganizing. Using data on indivudial state banks from nine states, I find that some of the banks that failed during panics were at least as financially sound as banks that pursued alternative ways of exiting during non-panic periods, suggesting that bank panics forced some banks to fail that might otherwise have exited the banking system in a less disruptive manner.

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The Great Depression was punctuated by several banking panics that, in the history of the United States, were unprecidented in size and severity (Calomiris and Gorton 1991).[2] Some of the literature trying to understand the effect of the panics on the banking system has focused on describing the timing and geography of bank failures during panics (Wicker 1996). Other work has tried to determine whether panics were exceptional periods that resulted in the failure of solvent banks by comparing banks that failed during panics to banks that failed outside the panics and banks that survived ((Calomiris and Mason 1997) and (White 1984)). The latter studies concude that banks that failed during panics were weaker than banks that survived and not very different from banks that failed during non-panic periods.

Analyzing only whether panics caused solvent banks to fail, however, may miss an important effect of panics. Specifically, panics may have caused troubled banks to fail that might otherwise have resolved their difficulties in a less disruptive manner. This paper explores this hypothesis by testing whether some of the banks that failed during the banking panics might have been able to either merge with other banks or suspend, reorganize, and reopen at a later date. State chartered banks from nine states are divided into several groups: banks that survived the Depression, banks that failed during panics, banks that failed during non-panic periods, banks that merged, and banks that suspended but later reopened.[3] I then conduct a series of comparisons across these groups. Banks that failed during panics are found to be stronger than other banks that failed, although they were decidedly weaker than banks that survived the Depression.[4] The average economic viability of banks that

[2]Exactly what constitituies a panic varies somewhat in the literature; some focus on changes in the money supply (Friedman and Schwartz 1963) while others focus on changes in risk spreads (Mishkin 1991). This paper focues on periods when large numbers of banks were the subject of bank runs.

[3]There is also a group of banks that voluntarily liquidated, but there are too few of these banks to conduct a meaningful comparison.

[4]The strength of the a bank is related to both its solvency and liquidity. Exactly how this is

pursued alternative exits to failure was also greater that of banks that failed and less than for banks that survived, which suggests that not every bank had the option of merging or suspending and reorganizing. When comparing banks that failed during panics to banks that merged or suspended, I find that banks failing during panics were not as strong as banks that merged but they appear to be at least as economically viable as banks that suspended.

The findings of this last exercise support the hypothesis that panics may have forced some banks to fail that might otherwise have been able to exit in a less disruptive way. If this is the case then regulators are justified in taking action to prevent panics, particularly if bank failures reduce the credit available from the banking system and subsequently have a negative impact on industrial output as suggested by Bernanke (1983) and Anari, Kolari, and Mason (2000).

The data set used in this study is unique. Most studies have used either state level aggregates or data from nationally-chartered banks. Using bank level data allows more detailed analysis than does aggregate data and analyzing state-chartered banks, which comprised the bulk of bank exits, allows a more detailed study of panics.

The paper is organized as follows. Section 2 presents background literature related to bank panics during the Great Depression. Section 3 discusses the data used in this paper and compares the merits of using this data relative to data that has been used previously. Section 4 presents comparisons of banks that failed during panics to banks failing during other times. Section 5 tests whether banks that failed during panics could have exited in other ways. Section 6 concludes.

Section II. Background

The historical literature has identified four widespread banking panics taking place

measured is discussed below in detail.

during the Great Depression (Friedman and Schwartz 1963, Wicker 1996). The first panic occurred in the fall of 1930. Friedman and Schwartz (1963) attribute this panic to a "contagion of fear" caused by the failure of the Bank of the United States. Wicker (1996), however, finds that the panic was triggered by the failure of Caldwell and Company, and was a regional panic that occurred as speculation about insolvency spread through Caldwell and Company's large correspondent banking network. There were two panics in 1931. One, which Wicker suggests was due to the collapse of a real estate bubble in the midwest, occurred in the spring of 1931. The other, more severe panic, occurred in late 1931. Friedman and Schwartz attribute this panic to an attack on the currency as concern arose that U.S. would follow Great Britain and leave the gold standard. Wicker, however, argues that the lack of instability in the New York money market indicates that Britain's departure was not the source of the panic. The fourth panic swept the country at the beginning of 1933 and resulted in the declaration of the National Bank Holiday. Friedman and Schwartz claim that the panic of 1933 occurred because people hoarded specie out of fear that the incoming administration would devalue the currency. States attemped to prevent panics by declaring statewide bank holidays, which had the effect of increasing the withdrawal pressures on banks in nearby states.

Several studies have tried to determine whether panics were "special" and resulted in the failure of solvent banks, or whether banks failing during panics are similar to banks failing outside panics. White (1984) compares banks failing in the panic of 1930 with banks that had failed earlier. He finds that banks that failed during the crisis were not significantly different than previous failures. Calomiris and Mason (1997) examine the panic that occurred in Chicago in 1932. They find that the same forces that explain non-panic failures can explain the panic failures. In particular, market-to-book values of net worth were lower and interest rates paid were higher for failing banks than surviving banks. The panic may have shortened the time until these banks failed, but it did not cause banks to fail that would not have failed otherwise.

In their analysis of the factors that contributed to the survival of individual Federal Reserve member banks, Calomiris and Mason (2000) include indicators for panic periods. They find that banks were more likely to fail during the panic of 1930 and the second panic of 1931 as identified by Wicker (1996) even after controlling for economic fundamentals.[5] This does not imply, however, that panic failures could not be explained by fundamentals as an indicator for the Chicago panic of 1932 mentioned above also indicated an abnormally high failure rate.

One other study worth noting was conducted during the Great Depression by the Federal Reserve (1938) entitled "A Sample Study of the Records of Suspended Banks." Although not specifically about panics, the study focuses on the deposit losses experienced by banks prior to closing, a topic generally associated with panics. Several interesting facts were uncovered. The study notes that although bank runs involving long lines at banks were the most spectacular symbol of panics, many of the runs were "invisible." Invisible runs would occur when holders of large deposits transfered deposits from one bank to another via check or used their deposits to purchase illiquid assets, such as commercial mortgages, from the bank. Correspondingly the study finds that large deposits decreased much more prior to bank suspensions than did small deposits.[6] The type of deposit was also important. Suspending banks experienced moderate declines in demand deposits and only slight declines in time deposits. Interbank deposits were extremely quick to leave banks experiencing trouble, declining at a rate over three times that of demand deposits.

[5]Dummies for the panics identified by Friedman and Schwartz (1963) were not significant

[6]The study finds that for banks that suspended between June 30 and December 31, 1931 that the percentage change in demand deposits between June 30 and the date of suspension was about -60 percent for deposits above $50,000 but only -17 percent for deposits between $500 and $1000.

Section III. The Data

The empirical literature on Depression Era bank failures has primarily analyzed either state-level aggregates ((Mitchener 2000) and (Wheelock 1995)) as reported by the Federal Reserve's Banking and Monetary Statistics (1943) [hereafter BMS] or individual National or Federal Reserve member banks (Calomiris and Mason 2000, White 1984). This paper uses data on individual state chartered banks taken from the annual reports of state banking authorities. Here I discuss the relative merits of these different data sets and provide a brief description of the data used in this study. Appendix 1 contains a more detailed description.

Comparison of the Data with Other Data in the Literature

State level aggregate data is available from the BMS for both national and state chartered banks and has the advangage of uniformity across both states and years. However, using state level aggregates does not allow bank level characteristics to be analyzed and the distribution of failures over the course of the year is hidden. This data also reports banks that suspend temporarily and banks that failed together.[7] As it is not clear that bank failures and temporary suspensions are similar events, results using state aggregates must be interpreted carefully.

Data on individual Federal Reserve member banks (all national banks and some state chartered banks were members of the Federal Reserve) allows individual bank attributes and exit methods to be analyzed, while still being uniform across states. However, many of the banks that failed during the Depression were not members of

[7]The sum of temporary suspensions and failures is referred to as suspensions in the BMS. In an attempt to avoid confusion in this paper, I refer to the sum of temporary suspenisons and failures in the BMS as closures. Throughout this paper the term exits is used to refer to the sum of temporary suspensions, failures, and mergers (even though a temporary suspension may not actually be a permanent "exit").

the Federal Reserve System, especially during panics.[8]

The data used in this paper consists of the balance sheet information of individual banks from the annual reports of the banking authorities of nine states: Alabama, California, Maryland, Missouri, Nebraska, North Carolina, Ohio, Oregon, and Wisconsin.[9] Like data on Federal Reserve members, this data includes individual bank attributes and information on how banks exited the banking system. The state data set also includes many banks that exited during bank panics. A disadvantage, however, is that information from some states is simply not available while information from other states is incomplete. Balance sheet items reported in the annual reports vary by state, restricting the information that can be used. This data set is thus an important complement to other data sets, but it is not a substitute for them.

Table 1 contains a comparison of bank exits by state using data from state reports and the BMS. Closures of state banks in the BMS generally follow the sum of state bank failures and suspensions fairly closely. Comparing the patterns of failures and suspensions, it is clear that suspensions are not a consistent share of failures, again encouraging careful treatment of results using state level bank data from the BMS.

Brief Description of the Data

The sample consists of 4,263 state commercial banks operating in nine states on

[8]Banks that were members of the Federal Reserve accounted for 25 percent of bank closures and 55 percent of the deposits at closed banks. About 80 percent of bank closures and about two-thirds of deposits of closed banks were accounted for by the closure of state banks. There is some overlap as some state chartered banks were also memebers of the Federal Reserve. (BMS)

[9]For the years 1930-1932 the state bank closures in these states represent 24 percent of state bank closures and 20 percent of all bank closures. These states are used in large part because the reports of their bank supervisors contain a large amount of balance sheet information and provide details on bank failures, mergers, and suspensions. These states also were selected to be somewhat geographically representative. Most regions in the United States are represented with the exception of New England; however, BMS reports very few state bank closures in New England over the sample period.

July 1, 1929.[10] The bank balance sheet information is drawn from the annual reports that most closely preceeds the stock market crash in 1929, typically either January 1, 1929 or June 30, 1929, and includes information such as assets, loans, securities, cash, capital, deposits, and bills of rediscount. (See Appendix 1 for the exact day for which the balance sheet data for each state is reported and the details of the balance sheet items.) In addition to the balance sheet information, I record whether the bank engaged in trust activities and whether the bank was a member of the Federal Reserve System.

The sample period ends March 1, 1933. Banks that remained open throughout the sample period are survivors. Otherwise the date and method by which the bank exited the banking system, albeit sometimes temporarily, is recorded. The methods by which banks could exit were by failing, merging with another bank, voluntarily liquidating, or suspending temporarily and reopening later.[11] A few banks, about five, suspended, reopened and later failed. These banks are treated as suspensions in the analysis since it is the way they first exited the banking system. The results do not vary depending on how these banks are treated. A few banks, less than ten, close but are reopened much later strictly for the purpose of being sold to another institution. These banks are treated as failures. Again the results do not vary depending on how these banks are treated. Only about 45 banks in the sample liquidated voluntarily, although nearly every state had one or two banks exit in this way. The lack of observations makes analysis difficult, and no attempt will be made to explain whether banks that voluntarily liquidated were different from other banks. It is interesting to note that although this was a possible way for banks to exit the banking system, few opted to

[10] Again the states are Alabama, California, Maryland, Missouri, Nebraska, North Carolina, Ohio, Oregon, and Wisconsin.

[11] For banks that failed one would like to know the date the bank closed. However, some states record instead the date that a receiver was appointed for the bank, which is then used as the exit date rather than the date the bank was closed.

use it.

Several county variables are also compiled. County population (total and urban) is available from the census and is used to control for the environment in which the bank operated. Also, as a measure of competition, the number of banks per capita is included in the analysis.

Section VI. Were Panic Failures Different than Other Failures?

In this section, I test whether banks that failed during panics differed from banks that failed during other periods. This analysis involves several steps. First, the banks that failed during panics are identified. Two methods are used to do this; the first uses the historical record and a second uses patterns in the data. Second, an appropriate comparison metric must be constructed. This is done using an exercise similar to Calomiris and Mason 1997. The effect on the lifespan of the bank of different balance sheet items and location factors are determined using survival analysis and a sample of banks that survived the Depression and banks that failed outside of panics. After finding out what influences survival, we can compare the average balance sheet positions of different bank groups and assess their relative strength.

Which Banks are Considered Panic Failures?

Bank panics are defined in this paper as periods in which large numbers of banks are subjected to runs. As it is not always possible to know if a bank run has occured, periods where large numbers of banks fail are considered to be panic periods. Even focusing only on periods of elevated bank failure rates, there is disagreement on the length and scope of the panics. Friedman and Schwartz (1963) suggest that the panics of the Depression were nationwide and enduring. Wicker (1996) argues that panics were generally regional and lasted at most a few months. Calomiris and Mason (2000) find patterns of heightened failure rates corresponding to some of the panics described by Wicker (1996) and less support for the banks described by Friedman and Schwartz (1963).[12]

Two different panic indicators are used in the analysis here. The first follows closely the panic periods indentified in the historical record by Wicker - November 1930 in North Carolina, May-June 1931 and August-October 1931 in Ohio, and August-October 1931 and January-Febuary 1933 for Missouri - and also includes January 1932 in California, following Carlson (2001).[13] The other indicator uses the data to identify panic periods and is constructed using the share of banks that fail in a state during a month. If 1.9 percent of the states' initial number of banks fail, the state-month is considered a panic.[14]

Table 2 provides a listing of the states and months that are considered panics using the different methods. As might be expected, there is a sizable overlap between the two indicators. About 15 percent of the banks that failed did so during panics (12 percent using the historical indicator and 21 percent using the failure based indicator).

A Comparison Metric

The simplist method of comparing groups of banks is to compare the average levels of different balance sheet items as well as average location characteristics. Of particular interest are balance sheet items that reflect the solvency and liquidity positions of the bank. A stronger solvency position is indicated by a larger ratio of net worth to assets and a lower ratio of bills and rediscounts to liabilities; bills and

[12]Calomiris and Mason find evidence of regional panics in 1930 and late 1930 consistent with Wicker, but do not find evidence of a panic in early 1931.

[13]These dates also closely follow Calomiris and Mason 2000. Some adjustments have been made so that banks specifically mentioned as panic failures by Wicker (1996) are included.

[14]In the distribution of failure rates across states and months, 1.9 percent is approximately the 95th percentile.

rediscounts were often used by banks having difficulties raising funds due to concerns about their solvency (White 1984). Liquidity is measured using the ratio of cash to financial assets, cash being the most liquid asset possessed by banks.[15] The ratio of securities to assets may also provide a measure of liquidity. However, it is not clear that all securities in total securities would necessarily be liquid. In addition to the balance sheet positions, the size of the bank measured by log assets, likely affects survival as large banks may have been more diversified.

Other characteristics of individual banks are also worth examining. Being a member of the Federal Reserve System meant that the bank was subject to additional regulation but was also able to access the discount window, which may have better enabled the bank to survive. Operting a trust may have given the bank additional revenue sources and boosted survival. Characteristics of the banks' operating locale are included as well. More competition, measured by the number of banks per capita, may have shortened survival. As Temin (1976) suggested that a decline in agriculture prices and the value of farm land may have been partly responsible for bank failures, being located in a more urban environment may boost survival.[16]

To confirm that the balance sheet items and location characteristics affect survival in the expected way, I estimate their impact on bank survival using duration analysis. The sample of banks used in this estimation consists of banks that survived the Depression and banks that failed outside of panic periods.[17]

This procedure has the additional advantage of allowing out-of-sample analysis similar to that used by Calomiris and Mason (1997). Predicted survival times can be constructed for all banks (both for those used in the regression and for out-of-sample

[15]Finanical assets are the sum of cash, securities, and loans, which reflect the banks' portfolio decisions. Other reported balance sheet items are bank house, other property, and other assets.

[16]As an alternative, I also tried including the ratio of agricultural income to manufacturing, but found no effect.

[17]If either panic indicator suggests the bank failed during a panic, it is not included.

banks) using the estimated coefficients and each banks' individual balance sheet and location information. The predicted survival time serves as a summary statistic of the banks' overall economic health.[18] Bank groups can thus be compared by looking at average levels of different balance sheet ratios as well as predicted survival length.

Regression results appear in Table 3 and are similar to previous work (Calomiris and Mason 1997, 2000, Carlson 2001, and White 1984). The measures of solvency are as expected; banks with higher net worth and banks with fewer bills and rediscounts, survived longer. Banks also benefited from being more liquid, i.e. having higher levels of cash and securities. I also find that large banks survived longer while those with trust components failed earlier. There was little effect from being a member of the Federal Reserve system, facing more competition, or being located in a more urban setting.

Comparing Banks Failing in Panics to Other Failures

Comparisons of balance sheet items and predicted survival times for surviving banks and banks failing inside and outside of panic periods appear in Table 4. The results suggest that banks that failed during panics were somewhat stronger than banks that failed during non-panic periods, but were not as strong as banks that survived the Depression. Average net worth was the same for all groups. There is a slight suggestion that banks failing during panics had fewer bills and redisounts relatvie to assets than other failing banks, but the average ratio was definitely higher than for surviving banks. The relative liquidity of banks failing during panics is uncertain. As measured by the share of securities in financial assets, banks failing during panics were more liquid than banks failing outside panics but less so than

[18] Thus the measure used to compare banks that merged, suspended, or failed during panics is not influenced by them.

surviving banks. The average ratio of cash to financial assets was roughly the same for all groups except banks failing during panics according to the incidence of failure indicator. Banks failing during panics also tended to be larger, a characteristic found to increase survival. Although not found to affect survival, it is worth noting that banks failing during panics were more likely to be members of the Federal Reserve, faced less competition, and were somewhat more likely to be located in more urban areas than other banks.

The average predicted survival time, which summarizes the differences in balance sheet and location characteristics also suggests that banks failing during panics were stronger than other banks that failed. Banks that failed during panics had a significantly longer average survival time than banks failing outside panics, though shorter survival time on average than banks that survived the Depression. These results are similar to those of Calomiris and Mason (1997). They suggest that banks failing during panics were financially stronger than other banks that failed though they may not have been strong enough to survive the Depression. It is possible however that they may have been financially viable enough to pursue alternative exit strategies. This question is examined in the next section.

Section V. Were Panic Failures Different than Other Failures?

The previous section found that banks that failed during panics were stronger than banks that failed outside of panics, although they were not as strong as survivors. This section compares panic failures to banks that suspended and banks that merged to determine whether banks that failed during panics might have been able to exit the banking system in a less distruptive way.

Mergers were the second most common way of exiting the banking system after failures (about 25 percent of all exits in the sample were mergers). The merger combinations were varied with large banks buying small banks, particularly in California, banks of similar sizes merging, and there were even a few cases when a smaller bank purchased a larger one.

About 10 percent of banks in the sample that left the banking system did so by suspending temporarily, reorganizing, and reopening. For banks in which the date of reopening is also knows, about 70 percent of the suspensions in the sample, the median length of suspension was 144 days (about 5 months) with the longest suspension being nearly two years and the shortest being about a week. It is important to note that these are suspensions by individual banks; banks that closed as part of a city or statewide banking holiday are not included. In fact, banks closing during such holidays were generally not recorded by the state regulators as suspensions.

Economic Viability of Banks that Merged or Suspended

Table 5 presents a comparison of the average balance sheet positions and location characteristics as well as the predicted survival length for banks that merged and banks that suspended relative to banks that survived and banks that failed outside of panics. Banks that merged are relatively financially sound having higher ratios of net worth to assets than other banks and lower average ratios of bills and rediscounts to liabilities than banks that failed outside panics. The strength of banks that merged is also apparent in their expected survival time which, while shorter than that of surviving banks, is substatially longer than the expected survival time of banks failing outside panics. These results are consistent with those found by Carlson (2001).

As indicated by their shorter expected survival length, banks that suspended do not appear to have been as economically viable as banks that survived the Depression. Banks that suspended had lower net worth to asset ratios than banks that survived or banks that failed. Also reflecting lower economic viability, the share of liabilities consisting of bills and rediscounts a banks that suspended was higher than at banks that survived and the same as at banks that failed. Banks that suspended may also have been less liquid, with lower cash to asset ratios than other banks. Despite the apparent weakness in some of their balance sheet positions, banks that suspended had longer expected survival times than banks that failed outside panic periods. This likely reflects their large size and somewhat larger securities holdings, both of which supported survival.

Perhaps surprisingly, banks that merged are found to have been stronger than banks that suspended but were able to reorganize, reopen, and continue as viable independent financial institutions. It may be that banks that merged were strong enough to find immediate buyers while banks that suspnded did so because it took some time to locate backers for the needed reorganization.

Comparison of Banks that Failed During Panics to Banks that Suspended

To test whether panics caused banks to fail that might otherwise have been able to avoid failing, we compare banks that failed during panics to banks that suspended and later reopened.[19] The results appear in Table 6.

We find that banks failing during panics appear to have been at least as economically viable as banks that suspended but later reopened. With higher net worth and the same average ratio of rediscounted bills to assets, the balance sheet items used to indicate solvency were at least as strong at banks that failed during panics as banks that suspended. Banks that failed during panics may also have been more liquid, with a larger share of cash in financial assets than banks that suspended. The measure of overall bank viability, expected length of survival, is not significantly different

[19] This analysis compares banks that failed during panics to all banks that suspended. Alternatively, one might with to compare banks failing during panics to banks that suspended during non-panic periods. Doing so yields similar results.

for these two groups of banks. This suggests that at least some banks that failed during panics were at least as economically viable as banks that suspended and later reopened, but were forced to close permanently because of the panic.

We further attempt to provide a measure of the impact that panics had on bank failures by determining which banks would have been most likely to be able to suspend and reorganize had not the panic occurred. Banks that failed during panics are considered to been forced to fail as a result of the panic if their expected length of survival was greater than the mean predicted probability of survival of banks that suspended. Depending on which panic index is used, banks that failed due to the panic represented 4.9 percent or 7.3 percent of all bank failures in the nine states examined here. However, banks that failed during panics were larger than other banks, so that banks found to fail as a result of the panic represent between 27 percent and 30 percent of the assets of all failed banks in the sample. These numbers should be considered only rough estimates of the impact of panics, as the sample of states used certainly affects these estimates. Nevertheless the evidence does suggest that the effect of panics on bank failures is likely to be significant.

Discussion

Finding that banks that failed during panics were more economically viable than other banks that failed and were at least as viable as banks that suspended but were able to reopen suggests that panic periods were different than other periods. One likely explanation is that the surge in banks that were experiencing difficulties prevented an orderly restructuring of troubled banks. Other scholars (Ferderer and Richey 2002) have noted that asset price volatility increases during panics. This would further act to prevent an orderly restructing of problem banks. Banks that could not be restructured may have been forced to fail.

Section VII. Conclusion

The empirical literature on banking panics finds that banks that failed during panics were generally economically weaker than the ones that survived. This study argues that this result, while accurate, provides an incomplete picture of the effects of panics. Banks had alternatives to failing during regular times; they could either suspend and reorganize or merge with other banks. Thus this study examines whether banks that failed during panics might, in ordinary times, have pursued these other options.

The results suggest that this was indeed the case. Banks that failed during panics had stronger balance sheets than other failures, and indeed the balance sheets of the panic failures were at least as strong as banks that suspended and were able to reorganize and reopen. During panics, banks were likely prevented from reorganizing due to the surge in problem banks and uncertainty in pricing financial assets during panics.

The period of liquidation following bank failure caused assets to be frozen for longer periods than when banks suspended and reorganized.[20] The length of time that bank assets were frozen may have had a negative effect on output through the credit channel (Anari, Kolari, and Mason 2000). Thus if panics prevent banks from being reorganized and instead cause them to fail, as is found in this study, then panics may have real effects. In this case, regulators may be justified in taking steps to prevent panics and ensure orderly market operation.

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[20] The median length of suspension in this sample was about 5 months. Anari, Kolari, and Mason (2000) find that the average length of liquidation was about 6 years.

Data Appendix

Sources

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CALIFORNIA - Annual Report of the Superintendent of Banks (1928-1935)
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Reporting date: December 31, 1928.

Balance Sheet Items

The following is a list of the variables/descriptions used in the analysis.

Assets
Loans: Loans and discounts
Total securities: Stocks, bonds, and other securities
Cash: Cash in hand or in the vault
Due from banks: Due from other banks
Assets: Total assets

Liabilities
Capital: Capital paid in
Surplus: Surplus
Profits: Undivided profits
Net worth: Capital+surplus+profits
Bills: Bills payable + notes rediscounted

Bank Variables
Log assets: Log of assets
Financial assets: Loans+total securities+cash+due from banks
Share securities in financial assets: total securities/financial assets
Share cash in financial assets: Cash and due from/financial assets
Net worth to assets: (Capital+surplus+profits)/assets
Bills to assets: Bills/assets
Trust: Dummy indicating the bank has a trust component
Federal Reserve Member: Dummy indicating the bank is a member of the Federal Reserve system

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Table 1
Comparison of Exits by State

	Alabama			California			Maryland			Missouri			Nebraska		
Banks at Period Start	247			184			138			1166			674		
	1930	1931	1932	1930	1931	1932	1930	1931	1932	1930	1931	1932	1930	1931	1932
Total Exits	*42*	*36*	*13*	*10*	*9*	*22*	*12*	*10*	*1*	*141*	*145*	*99*	*19*	*64*	*59*
Mergers	13	4	1	5	1	4	4	2	0	40	43	19	0	1	1
Voluntary Liquidations	1	5	4	0	0	0	1	0	0	5	2	6	0	0	0
Failures	25	26	5	5	8	16	3	6	1	92	92	69	6	51	51
Suspensions	3	1	3	0	0	2	4	2	0	4	8	5	13	12	7
Failures and Suspensions	*28*	*27*	*8*	*5*	*8*	*18*	*7*	*8*	*1*	*96*	*100*	*74*	*19*	*63*	*58*
Closure of State Banks (BMS)	*27*	*28*	*12*	*5*	*10*	*19*	*1*	*15*	*3*	*97*	*110*	*72*	*42*	*101*	*48*
Fed Member Closures (BMS)	*8*	*9*	*9*	*2*	*9*	*14*	*0*	*3*	*1*	*7*	*13*	*9*	*4*	*8*	*5*

	North Carolina			Ohio			Oregon			Wisconsin			Total		
Banks at Period Start	342			577			139			798			**4265**		
	1930	1931	1932	1930	1931	1932	1930	1931	1932	1930	1931	1932	1930	1931	1932
Total Exits	*66*	*55*	*32*	*37*	*84*	*29*	*9*	*18*	*28*	*40*	*51*	*89*	*376*	*472*	*372*
Mergers	13	7	4	15	9	7	7	9	9	15	10	27	112	86	72
Voluntary Liquidations	1	0	1	1	0	0	0	0	1	0	1	3	9	8	15
Failures	49	43	25	18	54	19	2	9	17	11	30	56	211	319	259
Suspensions	3	5	2	3	21	3	0	0	1	14	10	3	44	59	26
Failures and Suspensions	*52*	*48*	*27*	*21*	*75*	*22*	*2*	*9*	*18*	*25*	*40*	*59*	*255*	*378*	*285*
Closure of State Banks (BMS)	*83*	*49*	*26*	*20*	*86*	*21*	*2*	*10*	*28*	*23*	*41*	*63*	*300*	*450*	*292*
Fed Member Closures (BMS)	*10*	*14*	*5*	*4*	*34*	*2*	*0*	*7*	*12*	*1*	*7*	*4*	*36*	*104*	*61*

Table 2
States and Months in Which Panics Occurred

Using Historical Record	Using Prevalence of Bank Failures
Alabama No Panics	Alabama December 1930 – January 1931
California January 1932	California January 1932 January 1933
Maryland No Panics	Maryland No Panics
Missouri August 1931-October 1931 January 1933 – February 1933	Missouri October 1931 January 1933
Nebraska No Panics	Nebraska November 1931
North Carolina November 1930	North Carolina November 1930 – December 1930 December 1931 February 1933
Ohio May 1931 – June 1931 August 1931 – October 1931	Ohio August 1931
Oregon No Panics	Oregon February 1931
Wisconsin No Panics	Wisconsin October 1932

Table 3
Survival Analysis Using Banks that Survived and Banks that Failed Outside Panics

Dependent variable: Number of days until the bank fails

Intercept	4.66 *** (*0.54*)
Log Assets	0.22 *** (*0.04*)
Securities to Financial Assets	2.12 *** (*0.25*)
Cash To Financial Assets	1.24 *** (*0.35*)
Net Worth to Assets	1.70 *** (*0.49*)
Bills and Rediscounts to Liabilities	-5.60 *** (*0.68*)
Trust	-0.33 ** (*0.15*)
Member of the Federal Reserve	-0.15 (*0.16*)
Share Population in Urban Setting	-0.08 (*0.13*)
Banks per Capita	-0.06 (*0.11*)
Scale	0.65 (*0.02*)
Observations	3500
Failures	683
Log-Likelihood	-2078

Note. The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. Standard errors are in parentheses.

Table 4
Comparison of Average Balance Sheet Ratios and Location Characteristics of Banks Failing in Panics to Those of Other Failing Banks and Surviving Banks

	Non-Panic Failures	Survivors	Panic Failures: Historical			Panic Failures: Failure Measure		
Log Assets	12.59	12.96	13.14	***	^	12.99	***	
Securities to Financial Assets	0.12	0.19	0.16	***	^	0.14	**	^^^
Cash to Financial Assets	0.15	0.16	0.15			0.12	***	^^^
Net Worth to Assets	0.15	0.15	0.15			0.15		
Bills to Liabilities	0.03	0.01	0.03		^^^	0.02	*	^^^
Trust	0.05	0.06	0.12	***	^^	0.08		
Member of the Federal Reserve	0.03	0.05	0.12	***	^^^	0.08	***	^^
Share Population in Urban Settings	0.26	0.31	0.43	***	^^^	0.32	**	
Banks Per Capita	0.43	0.39	0.33	***	^^	0.32	***	^^^
Survival Time	3179.07	4344.21	3852.83	***	^^	3578.38	***	^^^

Note. The symbols (***), (**), and (*) indicate the average for banks failing during panics is statistical significance from the average for banks not failing during panics at the 1, 5, and 10 percent level, respectively. The symbols (^^^), (^^), and (^) indicate the average for banks failing during panics is statistical significance from the average for banks that survived at the 1, 5, and 10 percent level, respectively.

Table 5
Comparison of the Average Balance Sheet Ratios and Location Characteristics of Banks that Merged or Banks that Suspended with those of Banks that Survived or Failed Outside a Panic

	Non-Panic Failures	Survivors	Banks that Merged	Banks that Suspended
Log Assets	12.59	12.96	12.92 ***	13.23 *** ^^^
Securities to Financial Assets	0.12	0.19	0.15 *** ^^^	0.14 ** ^^^
Cash to Financial Assets	0.15	0.16	0.15	0.13 ** ^^^
Net Worth to Assets	0.15	0.15	0.17 *** ^^^	0.12 *** ^^^
Bills to Liabilities	0.03	0.01	0.02 *** ^^^	0.03 ^^^
Trust	0.05	0.06	0.11 *** ^^^	0.09 **
Member of the Federal Reserve	0.03	0.05	0.07 *** ^^	0.07 **
Share Population in Urban Settings	0.26	0.31	0.35 *** ^^	0.26 ^^
Banks Per Capita	0.43	0.39	0.37 ***	0.47 ^^^
Survival Time	3179.07	4344.21	3908.28 *** ^^^	3728.05 *** ^^^

Note. The symbols (***), (**), and (*) indicate the average is statistical significance from the average for banks not failing during panics at the 1, 5, and 10 percent level, respectively. The symbols (^^^), (^^), and (^) indicate the average is statistical significance from the average for banks that survived at the 1, 5, and 10 percent level, respectively.

Table 6
Comparison of the Average Balance Sheet Ratios and Location Characteristics of Banks that Failed During Panics with Those of Banks that Suspended

	Banks that Suspended	Panic Failures			
		Historical		Failure Measure	
Log Assets	13.23	13.14		12.99	**
Securities to Financial Assets	0.14	0.16		0.14	
Cash to Financial Assets	0.13	0.15	*	0.12	
Net Worth to Assets	0.12	0.15	**	0.15	***
Bills to Liabilities	0.03	0.03		0.02	
Trust	0.09	0.12		0.08	
Member of the Federal Reserve	0.07	0.12		0.08	
Share Population in Urban Settings	0.26	0.43	***	0.32	*
Banks Per Capita	0.47	0.33	***	0.32	***
Survival Time	3728.05	3852.83		3578.38	

Note. The symbols (***), (**), and (*) indicate the average for banks failing during panics is statistical significance from the average for banks that suspended at the 1, 5, and 10 percent level, respectively.