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Local Banking Panics of the 1920s: Identification and Determinants[*]

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Abstract

Using a newly discovered dataset of U.S. bank suspensions from 1921 to 1929, we discovered that banking panics were more common in the 1920s than had been believed. Besides identifying panics, we investigate their determinants, finding that local banking panics were more likely when fundamental economic conditions were generally weak and more likely in "overbanked" states; they were less likely in states with deposit insurance or states where a relatively large share of banks belonged to chain banking organizations.

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1. Introduction

It is well known that during the 1920s the incidence of bank suspensions in the United States was very high.[1] On average, from 1921 through 1929, there were 635 bank suspensions per year, then-unprecedented levels that have been surpassed only by the extremely high rate of bank suspensions during the Great Depression years from 1930 to 1933. The wave of suspensions that engulfed the banking system during the 1920s affected mostly small banks. Previous research has highlighted several causes for these suspensions: agricultural shocks (Alston, Grove, and Wheelock, 1994), overbanking (O'Hara, 1983), government policy (Calomiris, 1992, 1993a, 1993b; Mitchener, 2005; Wheelock, 1992, 1993; Wheelock and Wilson, 1994), lax supervision by state banking authorities (Gambs, 1977; White, 1983), and even the growing use of the automobile, which permitted bank customers to bank farther from home (Alston, Grove, and Wheelock, 1994). All of these factors can be considered fundamental reasons for bank suspensions.

The very high incidence of bank suspensions, however, leaves open the possibility that, concurrent with failures driven by fundamentals, some proportion of the suspensions of the 1920s may have resulted from local banking panics. The voluminous literature on banking panics points out that no major banking panics took place during the 1920s,[2] and (perhaps as a result) the role of panics during that decade has received limited attention. Only a few papers make reference to the occurrence of either panics or bank runs during the 1920s. In a passing footnote, Schwartz (1987) cites several reports from the Comptroller of the Currency claiming that only a handful of the national bank suspensions of the early 1920s could be attributed to panics;

[1] Bank suspensions are banks that, because of financial difficulties, have been closed to the public, either temporarily or permanently, by supervisory authorities or by the banks' own boards of directors. Although with reference to bank closures before 1933 the word "suspension" is often used as a synonym for "failure," approximately 16 percent of banks suspended between 1921 and 1929 reopened.

[2] See Jalil (2013) for a very thorough review of this literature. See also Wicker (1996, 2000).

moreover, Schwartz also notes that no runs on national banks were reported after 1925. Vickers (1994) examines a panic in Florida and Georgia in 1926. More recently, Jalil (2013) indicates that five minor panics took place in the 1920s, and one of these—the Florida panic of 1929—is analyzed in Carlson, Mitchener, and Richardson (2011).

But although no national or even major banking panic took place during the 1920s, there are good reasons for suspecting that localized panics took place more frequently than the literature suggests. First, it is well known that before the establishment of national deposit insurance in 1933, banking panics were recurrent phenomena in the United States, and it has been shown that they tended to have long-lasting adverse consequences for depositor confidence (Ramirez, 2009). Inasmuch as the last major panic before the 1920s had occurred quite recently, in 1907–1908, a certain amount of depositor distrust or apprehension about the banking system ought to have been still present during the 1920s. Second, shortly after that earlier panic, several states began to experiment with their own deposit insurance schemes in an effort to restore confidence and forestall bank runs; the very creation of these schemes attests to many state authorities' continuing concerns about the fragility and vulnerability of their banking systems. Third, even if a deterioration of fundamentals can explain a large portion of the bank suspensions of the 1920s, it is still possible that, in the absence of perfect information, a bank suspension caused by fundamentals may have had spillover or contagion effects on neighboring banks—for if depositors observe a signal indicating that the health of the banking sector within a geographical area has been compromised, their lack of perfect information about the asset quality of the area's banks leaves them uncertain which bank is most vulnerable to the shock, and they may run on all banks in the exposed area (Calomiris and Gorton, 1991).

The use of a unique and previously unused dataset held by the FDIC allowed us to identify 35 clusters of suspended banks (182 suspended banks in all) between 1921 and 1929 and then to identify 14 of these clusters as local banking panics. Identification of local panics was followed by an investigation of the extent to which the incidence of these panics was influenced by a range of range of factors.

The dataset identifies all bank suspensions that took place between 1921 and 1933 and provides relevant information about each suspension.[3] To identify clusters of bank suspensions—defining cluster as a group of at least three suspensions during a specified period of time and within a specified geographical area—we complemented the information in this dataset with geographical coordinates of each financial institution's locality as well as with other financial data.

Although our method generates a variety of clusters with different numbers of suspensions and radii, the focus of our analysis is the clusters that have a minimum of four suspensions, with the specified period of time being 30 days and the specified geographical area being 10 miles. In other words, by definition each of the four or more suspensions in each cluster took place no more than 30 days after the preceding suspension in the cluster and within a 10-mile radius of the location of the previous one. Application of these criteria resulted in the identification of 182 bank suspensions occurring in 35 clusters between 1921 and 1929. After the clusters are identified, it is then possible— using reopening dates and contemporary newspaper reports of runs—to ascertain which of the clusters resulted from local banking panics. Of the 35 clusters, 14 fall into that category.[4]

[3] See Section 2 for more details.
[4] Jalil (2013) constructs a new series of bank panics from 1825 to 1929. For the period after 1865 he uses *Commercial and Financial Chronicle* reports of bank suspensions, failures, and runs to identify panics directly. It should be noted that Jalil's cluster methodology differs from ours; his clusters are derived from contemporaneously

Identification was followed by an investigation of the extent to which differences in various state characteristics (such as banking structure or banking regulation) influenced the incidence of these 14 local panics. Our findings are that the likelihood of panic increases with bank density and with a deterioration of economic fundamentals, and decreases with average bank size, with deposit insurance, and with an increase in the fraction of banks operating in chains. Branching regulation appears not to have any measurable effect on the incidence of panics.

Our paper contributes to the banking literature in at least two ways. First, this analysis demonstrates that during the 1920s local banking panics were more common than has been believed. Despite the measures taken by regulatory authorities after the Panic of 1907 (measures such as the adoption of deposit insurance in eight states), panics remained part of U.S. banking experience during the 1920s.

Second, investigating the determinants of these panics sheds light on the mechanism by which bank contagion takes place. For example, some theoretical papers on this topic (e.g., Allen and Gale, 2000; Dasgupta, 2004) highlight the possibility that contagion may arise through network effects or interbank linkages, but our finding that the incidence of panics decreases with an increase in the fraction of banks operating in chains (an observable characteristic that entails interconnection) suggests that network effects may be less important than the literature implies. Instead, our results seem more consistent with asymmetric-information theories of bank contagion (Calomiris and Gorton, 1991; Gorton, 1985; Chen, 1999). A weakening of underlying fundamentals (for example, a rise in commercial failures), in combination with asymmetric information (when, for example, depositors are unsure which banks are more exposed to such

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linked newspaper accounts, while our definition of clusters focuses on geographical and temporal dimensions. For more details on our methodology, see Sections 2-4 below.

deterioration of fundamentals), may lead to a rise in fear, which makes bank contagion more likely.

The rest of this paper is organized as follows: Section 2 discusses the method for defining bank suspension clusters, and Section 3 describes the algorithm for developing them. Since our ultimate goal is to identify which clusters are due to banking panics, we impose additional filters—described in Section 4—that enable us to differentiate between clusters that were due to panics and those that were not. Section 5 investigates the determinants of local panics. Section 6 offers some concluding remarks.

2. Method of defining suspension clusters

Our identification of clusters relies on data for the years 1921–1929 that are drawn from a manuscript list of all U.S. bank suspensions compiled during the 1930s and held by the FDIC. These lists were among the papers kept by Clark Warburton, an FDIC economist at the time. The lists contain each suspended bank's name, state, city, and charter type. They also provide the date of each bank's suspension and (if any) the date of each bank's reopening.[5]

Our construction of suspension clusters was aided by Calomiris and Gorton (1991)'s concept of a banking panic. In reference to the National Banking period (1863–1913), Calomiris and Gorton state: "A *banking panic* occurs when bank debt holders at all, or many, banks in the banking system suddenly demand that banks convert their debt claims into cash (at par) to such an extent that the banks suspend convertibility of their debt into cash or, in the case of the United States, act collectively to avoid suspension of convertibility by issuing clearing house loan certificates."[6]

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[5] In addition, the lists indicate whether the bank was in the process of liquidation or whether the liquidation had been completed, and the total deposits of the bank at the time of suspension.
[6] Page 112.

The Calomiris and Gorton concept was a useful starting point for constructing a procedure that would allow us to identify local banking panics, but their concept required elaboration because it is incomplete and contains elements of ambiguity: it is incomplete in that it does not define the meaning of "many" institutions and does not specify either the boundaries of the banking "system" or the role of timing; and the very terms "many banks" and "the banking system" are ambiguous. To define clusters—that is, potential panics—in a way that can be implemented empirically, one needs to establish the key dimensions of number, system, and timing.[7]

Number. What, exactly, is the minimum number of banks necessary to characterize a group or series of suspensions as a panic? Can a situation when, for example, only two or three banks suspend be called a "banking panic"? If not, how many more are needed? There is no clear-cut answer to this question, so we based our clusters on various numbers of suspensions. The number of suspensions in our clusters ranged from 3 to 8.

System. What is the proper definition of "the banking system"? This is an important issue because apart from the unusual situation when the entire country is involved, some smaller geographic region will implicitly delineate the system for the purposes of determining whether or not a banking panic has taken place. It is one thing to say that, for example, 10 small banks scattered throughout the entire United States suspend in a given time frame. It is another thing to say that 10 small banks located in a given county suspend in the same time frame. The first case does not fulfill the definition of a panic because the "system" is not at stake. The second case, however, approaches the

[7] Moreover, as elaborated on in the following section, in order to rule out clusters of suspensions driven by an adverse local economic shock one needs further tests and filters.

definition of a banking panic if one agrees to delineate the county as the "system" (or, in other words, if one agrees to accept a countywide banking market as the relevant banking "system"). Although this second situation does not correspond to a banking panic on a national scale, it may reasonably be classified as a "local" banking panic.[8]

Timing. How close in time do the bank suspensions have to be for them to be characterized as belonging to a "panic" (local or otherwise)? Clearly if all banks suspend on the same day, the timing component of a panic is certainly less ambiguous. Similarly, if the suspensions take place years apart, they should not be classified as a panic. But what if each suspension occurs relatively soon after the previous one? After all, contagion-caused bank suspensions cannot be expected to have happened instantaneously. In the 1920s, information or a rumor would most likely have required some time to travel, and the time required would most likely have been proportional to distance: a run on some particular bank in a given place would probably affect nearby banks sooner than more-distant banks. And even assuming that the speed at which information spread was relatively high (and thus that a bank suspension would result in runs at other local banks relatively quickly), these runs at other local banks do not necessarily imply immediate or imminent suspensions of the banks. Banks that experienced sudden surges in deposit withdrawals were able to withstand them for days, and sometimes even weeks.[9]

It was within these three dimensions of number, system, and time that a "local" banking suspension cluster is delineated. Having established this general definition, the next step was to develop an algorithm for systematically identifying clusters of suspended institutions—

[8] Of course, before identifying such a local cluster as a "panic" one has to rule out the possibility that the suspension cluster is driven by an adverse local economic shock

[9] See, for example, Ramirez and Zandbergen (2013) for a case study of bank contagion in the city of Helena, Montana, during the Panic of 1893.

institutions that were suspended within a particular geographic area and during a particular time frame. After identifying the clusters, the final step was to investigate whether these clustered suspensions were the victims of runs. If they were, the designation "local banking panic" would seem appropriate.

3. Algorithm for identifying suspension clusters

As indicated above, local banking panics are assumed to have taken place within a relatively limited time and space. To systematically identify clusters of suspended institutions (potential panics), we developed an algorithm that uses a bank's suspension date and the geographic coordinates of each suspended bank's town. As a first step, the algorithm entails choosing a size, *S*, for the cluster. *S* defines the minimum number of suspensions in the cluster.

Next, the algorithm requires that each suspended bank within a cluster had to have occurred within 30 days and within a set radius of miles of a previous suspension. This second step can be described as follows: Assume that a bank suspension occurs at coordinates (x, y) and on date *t*. Then any bank suspension with coordinates $(x+\Delta x, y+\Delta y)$ and with suspension date $t+\Delta t$ would be included in the cluster as long as $(\Delta x)^2+(\Delta y)^2 \leq R$, where *R* is a set radius of miles, and $\Delta t \leq 30$ days. This computation was done for every suspension from 1921 through 1929 in the dataset. No cluster was declared complete until all suspensions that satisfied the described criteria had been included.

Obviously, there is an element of subjectivity in our choice of $\Delta t \leq 30$. Unfortunately, the theoretical literature on bank contagion does not offer any clear insight about the timing of such events. Instead, these theories focus on modeling the mechanism by which contagion spreads.[10]

[10] See, for example, Allen and Gale (2000, 2007), Dasgupta (2004), and Brusco and Castiglionesi (2007).

Therefore, our choice relies on an intuitive argument. Given that subjectivity is involved, it was appropriate to base the analysis on a reasonably conservative timing of events and on recent empirical research into bank contagion (Ramirez and Zandbergen, 2013). In general, it is understood that contagion exists when a bank failure or suspension leads to a sharp rise in withdrawals at another institution (Iyer and Peydró), 2011). But a rise in withdrawals does not necessarily result in another suspension immediately. As pointed out above, banks were able to withstand runs for days, sometimes even weeks, before suspension became the only viable alternative. The choice of 30 days is conservative enough to capture the suspensions of banks that were initially able to endure runs.

Our methodology has a twofold aim: to capture the maximum number of banks that satisfied the cluster requirements, and to avoid the double counting of suspensions. The importance of capturing the maximum number of banks is self-evident. Avoiding double counting is equally important because double counting could prove quite problematic. Consider the following example: a cluster of 5 banks (call them A, B, C, D, and E) belongs to $S = 5$. But this cluster of 5 banks implies 5 sub-clusters of 4 banks each (ABCD, ABCE, ABDE, ACDE, and BCDE). If double counting were allowed, $S = 4$ would contain a total of 6 clusters, when in reality there was only one (cluster ABCDE).

Although our methodology was cumbersome, it was also effective in making sure that the 5 sub-clusters of 4 banks each were not included. The algorithm was applied sequentially in descending order of size. For example, in the construction of the $S = 4$ cluster, the algorithm was first applied for $S = 8$. After all clusters of 8 or more banks were identified, the algorithm was repeated to find all clusters of exactly 7 suspensions. The total number of clusters in $S = 7$ is then those in $S = 8$ plus the additional clusters of exactly 7 suspensions just identified. This process was repeated to construct *S* = 6 (i.e., find all clustered suspensions with exactly 6 banks in them, then add *S* =7 to it), then to construct *S* = 5, and finally *S* = 4.

Our algorithm was generalized to allow for different radii. For clarity, an "*S*-*R*" cluster was labeled as a cluster with a set of at least *S* banks that were within *R* miles of each other and each of which was suspended within 30 days of the previous suspension. *S* was allowed to vary from 3 to 8, and three different values were chosen for *R*: 5 miles, 10 miles, and 20 miles. Thus, the broadest definition of a cluster is that it contains at least 3 banks that are within radii of 20 miles and that suspended within 30 days of one another. The most restrictive definition is the 8-5 cluster (having a minimum of 8 banks suspending within a distance of 5 miles and within 30 days.

Figure 1 presents a distribution of clusters as a function of *S* and *R*. The number of clusters ranges from as many as 222 (3-20 clusters) to 0 (8-5 clusters). Our choice for a detailed analysis was to be conservative and to focus on the 4-10 clusters. Why 4? With 4 or more banks suspending within a limited area and in a limited time frame, it is reasonable to suspect the occurrence of a local panic. Of course, no claim can be made that such clusters represent local panics unless there is further evidence, which is discussed below. Why 10? The average area of a 4-10 cluster is only about 11 percent smaller than the typical U.S. county (which has an area of approximately 1,207 square miles),[11] and the county is not only a standard geographical unit for examining local economic activity but is also generally considered to be the relevant banking market.[12] Thus, a radius of 10 miles is a good approximation for the relevant banking market area.

[11] The average 4-10 cluster covered an area of 1,075 square miles.
[12] For example, Kwast, Starr-McCluer, and Wolken (1997), using modern data, report that more than 90 percent of households and small businesses perform most financial transactions with a local (within a radius of 30 miles) bank.

In summary, the algorithm found 35 such clusters for the 1921 to 1929 period. The shortest length of time between the first and last bank suspensions in a cluster was 0 days, and the longest was 58 days, with the typical length of time being 13 days. Thus, in the typical cluster, the suspensions took place within a span of 2 weeks. It is worth pointing out that a significant proportion of those suspensions occurred within days of one another.

Table 1 presents the distribution of 4-10 clusters by state and reports the date (month/year). Although 15 of the 17 affected states had from 1 to 3 clusters each, the other 2 states—Florida and Iowa—experienced a disproportionately high number. Of these, Iowa fared worst, with 8 clusters during the middle to late 1920s (2 in 1925, 5 in 1926, and 1 in 1928).

4. 4-10 Clusters as local banking panics?

The preceding two sections explain our rationale and procedure for identifying clusters. It also explains why our analysis is concentrated on the 4-10 clusters. But can these clusters be reasonably characterized as local banking panics? Two pieces of evidence allow us not only to argue that *some of them* can but also to identify which ones. The two pieces of evidence are bank reopenings and newspaper accounts of bank runs.

4.1 Reopening rates

The logic for looking at reopening rates is straightforward. A solvency (or fundamental) shock ought to lead to a permanent closure. By contrast, a temporary suspension is more indicative of an illiquidity problem, such as those that occur when a bank has experienced a run.[13] Of course, a run could also take place as a result of a solvency rumor—a rational run.

[13] Although discount window borrowing was of course available during the 1920s, the vast majority of banks that suspended during the decade were state nonmember banks and so could not turn to the Federal Reserve for liquidity

Nonetheless, it would be hard to argue that a permanent, adverse fundamental shock has taken place in the market if a bank that suspends subsequently reopens within a short period of time (about a month).

Since reopening rates are integral to the story of localized banking panics, it is important to address how it was that, although most of the banks suspended during the 1920s closed permanently, a significant number reopened. An examination of state banking laws shows that many of the laws, with varying degrees of specificity, allowed suspended banks to reopen rather than be placed into receivership. Some states explicitly allowed banks to place themselves voluntarily in the hands of banking regulators but did not contemplate that all such banks would be closed permanently. Even in some of the states where regulators took possession of a bank, such a bank might reopen. Table 2, using a digest of banking laws (Welldon 1910), identifies state laws that demonstrate apparent flexibility in what would happen to a bank after suspension.

To identify which of the 4-10 clusters can be characterized as local banking panics, in Table 3 (Panels A, B, and C) we compare the reopening rates of suspended banks in the 4-10 clusters with the reopening rates for all other suspended banks.

Table 3, Panel A presents the distribution of reopening rates for suspensions in the 4-10 clusters. This panel indicates that 51 percent of these clusters (18 of 35, reported in the last 2 rows) had at least one bank reopening. Of the suspended banks that subsequently reopened, the majority (over 64 percent) reopened within three months, and nearly all (over 93 percent) reopened within six months.

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support. More specifically, 92% of suspended banks in 4-10 clusters were nonmember banks, leaving only 14 member banks that could have sought Fed support. In addition, as only 5 of these 14 banks reopened, it is likely that only those 5 might have used discount window borrowing as a means to overcome a liquidity problem. Discount window borrowing therefore was generally a negligible element in these local banking panics. For an example of the Federal Reserve's provision of liquidity support during a 1920s panic, see Carlson, Mitchener, and Richardson (2011).

Table 3, Panel B compares the reopening rate of suspended banks in the 4-10 clusters with the reopening rate of suspended banks outside the clusters. The percentages are markedly different. The reopening rate of suspensions in the clusters is roughly 10 percentage points higher than the equivalent rate for non-cluster suspensions, regardless of when those reopenings took place (3 months, 6 months, or at any time in the future).

Table 3, Panel C provides a formal test of this difference. It presents three logit regressions where the dependent variable equals 1 if the bank reopened at all (in Regression 1), reopened within 6 months (in Regression 2), or reopened within 3 months (in Regression 3). All three specifications deliver the same results: the reopening rate of suspended banks in the 4-10 clusters is significantly higher than the reopening rate of suspended banks in general. These results seem inconsistent with the notion that the clustering of bank suspensions is driven by a local economic shock. Because the effects of local economic shocks tend to be long-lasting, reopening rates of banks affected by such shocks should be lower. Thus, the reopening rates of suspended banks in the clusters make it unlikely that these clusters occurred because of an adverse (local) economic shock.

4.2 Newspaper evidence of bank runs

Another type of evidence one can use to ascertain whether some of the 4-10 clusters may be characterized as local banking panics is newspaper accounts of bank suspensions. Since the suspension date for each bank is available, newspapers permit us to investigate whether those suspensions were identified at the time as coming soon after (within a few days of) a run.[14] An

[14] Chung and Richardson (2006) identify another source that potentially provides reasons for suspensions during the 1920s. The Federal Reserve established the Branch, Group, and Chain Banking Committee in 1930 to conduct a retrospective study of the causes of bank suspensions during the previous 10 years. The committee's data, which are in the form of questionnaires sent to state banking regulators, are available in the National Archives. As a test, we

analysis can then compare the incidence of runs split by cluster association (whether the suspension was part of a cluster or not). We searched for news of all bank suspensions in all states where 4-10 clusters occurred from 1921 to 1929 (see Table 1 for the list of states).

The search engine in the ProQuest Historical Newspapers dataset (which covers the *New York Times, Wall Street Journal, Washington Post, Chicago Tribune, Atlanta Constitution, Los Angeles Times, Boston Globe,* and *Christian Science Monitor*) allowed us to retrieve all articles that contained both the word "bank" and the name of the town in which each suspended bank was located and that were printed within a week after each of the suspension dates for all suspended banks in the states where 4-10 clusters existed, whether a suspended bank belonged to one of the clusters or not. The next step was to review the content of each article about a bank suspension and to classify the article as either indicating or not indicating that a bank run had preceded the bank's suspension. Although the language varied somewhat, virtually all articles that indicated a run used the keywords "run" or "heavy withdrawals."

Next, the variable that was generated—an indicator variable with the value of 1 if the newspaper identified the suspended bank as having endured a run, 0 otherwise—is used in a logistic regression where the key independent variable is whether or not the suspension is in a 4-10 cluster.

The regression results are presented in Table 4. Regression 1 indicates that suspensions in the 4-10 clusters are nearly 18 times more likely than suspensions outside the clusters to be identified in the newspapers as being the victim of a run. Regression 2 includes the log of deposits to control for the possibility that larger banks are more likely to get newspaper coverage

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examined all the questionnaires concerning suspensions of Iowa banks (Iowa had the largest number of 4-10 clusters) and compared the causes of suspension identified in the questionnaires with evidence from contemporary newspapers. Our finding is that bank runs as a cause of suspension are significantly underrepresented in the questionnaire responses compared with newspaper accounts. Indeed, the correlation between identification by contemporary newspaper accounts as experiencing a run and the questionnaire responses is -0.032.

or exposure. But even after the inclusion of this control variable, the effect of being in a cluster is unambiguous: suspensions in 4-10 clusters are 16 times more likely to experience a run. Both regressions include state fixed effects to control for all state-level characteristics (such as deposit insurance, branching, etc.).

To confirm these regression results, it is worth examining more closely the distribution of "runs" split by cluster association. Table 5 presents this distribution. It indicates that approximately 28 percent (50 out of 182) of the suspensions that took place in clusters were indeed identified as being the victim of a run. By contrast, only about 1.24 percent (50 out of 4,009) of the suspensions outside these clusters were identified as being the victim of a run. The logistic regressions in Table 4 demonstrate that this large difference in percentage is statistically significant. Thus, it is clear that suspensions that occur in clusters are more likely than other suspensions to involve elements of a local banking panic.

4.3 Correlation between reopening rates and evidence of runs

Although the evidence presented thus far suggests that at least some of the clusters were indeed the result of local panics, the next step is to find a way of identifying which ones they were. Our position is that those clusters with at least some reopenings are likely to have been panics. Our means of testing this claim was to examine the correlation between reopening rates and news of bank runs both inside clusters and outside of them.

In Table 6 we estimate a logistic regression where the dependent variable is the indicator dummy that identifies whether or not a suspension is the victim of a run, and the control variable is whether or not the bank reopens. Also included is an interaction term of the bank reopening indicator variable with the dummy variable indicating whether or not the bank belongs to a cluster. The findings indicate that indeed the relationship between reopenings and runs is much stronger for banks inside the clusters. In fact, for suspensions outside the clusters, that relationship is statistically insignificant, even after controlling for size (Regressions 2 and 3) and state fixed effects. These results indicate that clusters that had bank reopenings were also the clusters that had experienced bank runs.

Of the 35 clusters identified, 18 had at least one bank reopening within a year. Of these 18 clusters, 15 were found to have suspensions caused by runs. The majority of the newspaper articles specifically mentioned the name of the suspended bank and either the word "run" or the phrase "heavy withdrawals" when referring to what happened to the bank. In a few cases however, the name the institution was not directly mentioned but the language used still suggested conditions that corresponded to a panic. For example, for the Georgia clusters in 1926 the runs were not ascribed to specific banks. This panic was so severe (70 banks were closed within 3 days) that newspapers were not providing detailed descriptions of runs for individual banks. It is clear, however, that runs were prevalent.[15] For the Florida cluster, also in 1926, rather than reporting news about runs, the newspapers noted that the banks closed to "protect depositors." This is an indication that the banks were preemptively closed to avoid runs, since earlier that year reports of bank runs elsewhere in the state were ongoing. Moreover, from newspaper reports it is clear that the four banks involved in the Florida cluster were associated with the Georgia panic of 1926.

Of the 18 clusters with at least one bank reopening, 3 were not accompanied by newspaper reports of runs or "heavy withdrawals." These were the clusters in Minnesota (1923), South Dakota (1926) and Kansas (1927). Newspapers describing the Minnesota cluster stated

[15] Georgia Banking Superintendent T. R. Bennett noted that "all sorts of wild rumors were started and at quite a number of places runs on the banks began" (*Los Angeles Times*, July 16, 1926, p.4).

that the banks were closed by the commissioner of state banks as a preventative measure following the failure of the State Bank of Ryegate in Montana. This action appears to have been motivated by concerns of contagion. Because these banks possibly were closed to avoid a run, there was no run to report. But it should be noted that all four banks in this cluster eventually reopened.

The Kansas cluster was caused by the closure of the banks in the J.W. Montee and J.G. Miller chain, after some of those banks suffered significant loan losses. Two of the six banks in this cluster reopened within three months. Although local newspapers did not report runs on the chain banks, they did indicate that the chain banks' difficulties caused a local panic as several nearby but unaffiliated banks endured "considerable excitement."[16] As none of these "excited" banks suspended, they were not detected by the cluster algorithm. There was however a panic associated with the cluster, and this case illustrates that not all local banking panics necessarily resulted in the suspension of all banks in the area.

Regarding the South Dakota cluster, none of the major newspapers reported the banks' suspensions, let alone runs on them. Although newspapers generally found bank closures to be newsworthy, they were by no means universally reported. Nonetheless, this cluster is classified as a local banking panic because it does satisfy our criteria—all six banks in this cluster closed within a short time span, all were within the specified radius, and in this particular cluster, all of them reopened in less than a year. Indeed, half of them reopened in less than 3 months. Given this, it is unlikely these banks suspended because they were insolvent.

Taking into account the reopening rates as well as the information provided by newspaper reports, the 18 clusters can therefore be classified as local panic clusters. It should be noted, however, that the presence of multiple panic clusters that are nearly simultaneous and in

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[16] See *The Iola Daily Register*, February 24, 1927, pp. 1,9.

close geographic proximity suggests that they could have been part of a larger banking panic. This was the case both for 3 Georgia panic clusters in July 1926 and for 3 Iowa panic clusters in November 1926. Allowing for these events reduces to 14 the number of panic clusters that can be labeled a local banking panic. The list of these 14 local panics is provided in Table 7.

5. Determinants of panics

After identifying local banking panics, the natural next step was to ask what economic variables, banking structure, and/or state regulatory characteristics may have increased fragility in the banking sector? Theoretical models of banking panics offer a useful framework within which the banking panics of the 1920s can be evaluated. The literature's theoretical side has offered two competing explanations of banking panics. The first one stems from the work of Diamond and Dybvig (1983) and emphasizes the possibility that panics may be the outcome of a "bad" equilibrium (random shifts in expectation) in which depositors' concern about illiquidity results in a run. An alternative theory, highlighted by Calomiris and Kahn (1991), Gorton (1985), and Calomiris and Gorton (1991), argues that panics are more likely when adverse economic shocks compromise the solvency of at least some banks in the affected area but incomplete and asymmetric information prevents depositors from being able to identify which are the compromised banks. As a result, a run may take place on every bank.

If panics are largely the outcome of random shifts in depositors' expectations about liquidity, economic fundamentals should not necessarily explain their incidence. But according to the Calomiris and Gorton asymmetric information theory, the incidence of banking panics should be a function precisely of economic fundamentals.

Straightforward intuition would suggest that other variables besides economic conditions ought to influence the incidence of panics. For example, it is not unreasonable to hypothesize that the degree of competitiveness ought to affect the likelihood of a banking panic. One strand in the literature makes that claim, arguing that banks operating in an overly competitive market face a higher probability of failure (O'Hara, 1983). And in fact, as mentioned in the introduction, "overbanking" has been highlighted as one of the factors explaining the higher incidence of bank failures during the 1920s. If overbanking increases the incidence of bank failures, then—because an increase in bank failures increases the vulnerability of the banking system and leads to rising uncertainty—overbanking ought also to influence the incidence of panics.

Intuition suggests, as well, that regulatory variables, such as state deposit insurance or branching regulation, should be additional factors affecting the incidence of panics. For example, some of the literature finds that during the 1920s, state deposit insurance reduced the incidence of bank failures due to runs but made failures due to mismanagement more likely (Chung and Richardson, 2006). And several papers argue that branching reduced the incidence of bank failures (Calomiris, 2000; Ramirez, 2003).

Intuition also suggests that still other variables, such as the industrial composition in the market (e.g., agricultural versus manufacturing states) or the presence of chain banking, ought to affect the incidence of panics. Alston, Grove, and Wheelock (1994) find that most bank failures of the 1920s took place in agricultural states, so our regression includes a variable that controls for the proportion of the state population in agriculture. The role of chain banking, however, is more complicated.

Recent literature has not studied the effect of chain banking on the incidence of panics,[17] yet there are good reasons for considering it. On the one hand, chains could have constituted a mechanism for the diffusion and contagion of a panic: in the absence of information about the financial health of institutions, a run on one bank may have spread to chain-affiliated institutions. Indeed, the literature on bank contagion includes a strand that highlights the importance of interbank linkages as the mechanism for the spread of contagion (Allen and Gale, 2000, 2007; Dasgupta, 2004; Brusco and Castiglionesi, 2007). On the other hand, if banks linked in chains had been able to support and lend money to each other in times of panic-driven distress, they could have better withstood runs. These two possibilities have quite different implications for the effect of chain banks on the incidence of panics, and therefore the extent to which chains affect panics is something that must be evaluated empirically.

The role of chains can be examined anecdotally, and to do that we captured the names of bank officers for all banks (suspended or not) within the geographic areas of 4-10 clusters and used the occurrence of a common bank president in two or more banks as a proxy for a chain. Our finding was that about 6 percent of all banks and 27 percent of suspended banks in those areas were part of a chain.[18] About 10 percent of all banks located within these clusters were part of a chain and did not suspend (Rand McNally, 1921–1929).

It seems possible that in at least some clusters, the chain was important to the dynamic of what occurred. For example, all 5 banks that suspended on January 30, 1926, in four towns in Emmet County, Iowa, shared the same president. As no other banks within the area of the cluster

[17] Contemporary researchers, however, did study the incidence of bank chains during the 1920s. See, for example, Willis (1934) and Cartinhour (1931).
[18] It should be noted that the management data cover only banks found within the geographical boundaries of each cluster within a year of suspension. Thus, the identified chains may have included additional banks (and even additional suspensions) outside the cluster boundaries. In addition, banks that appear not to be part of a chain could have shared a president with a bank outside the cluster boundaries and therefore actually have been part of a chain.

suspended, it seems plausible to infer that the chain was a significant factor in these suspensions. The same pattern holds for a cluster of 4 banks in Oklahoma that suspended on November 27, 1929.

However, it is not possible to generalize from these cases. Indeed, one could investigate other cases and arrive at a very different conclusion. For example, in November 1926, 7 out of 16 Iowa banks in two different clusters had a common president. One of the 7 suspended and never reopened, 3 suspended and reopened within two weeks, but 3 never suspended at all. This experience suggests that the chain may have been coincidental to the pattern of suspensions. Anecdotal evidence therefore provides only an incomplete picture of the role of chains in the dynamics of a panic.

The most straightforward and statistically robust way of testing whether the incidence of banking panics was affected by any or all of the variables mentioned above is by estimating a regression where the dependent variable is the number of panics a particular state experienced during the 1920s (1921 through 1929), and the independent variables capture the effects of the factors previously mentioned. The independent variables that capture competitiveness are: bank density, which is measured as the average (over all years in the 1920s) of the total number of banks divided by the state's population (in thousands) in 1920, and bank size, which is measured as the average (over all years) of the total assets for all banks, divided by the total number of banks. A higher value for this variable may indicate more concentration and thus less competition.

The model also includes variable that captures shocks to economic fundamentals. The firms one is risk, which is measured as the spread between the state's interest rate and the mean (computed over all states) interest rate. The spread is averaged over all years during the 1920s. A higher average spread implies that the cost of borrowing is relatively higher, a scenario that is more likely to take place when the underlying lending environment is riskier. It is possible, however, that higher average interest rates are driven by market power rather than risk, which is why we also control for the degree of competitiveness. The second variable that controls for fundamental shocks is average bank failures, which is measured as the average (over the 1920s) of the liabilities of failed banks in a given state divided by total bank deposits in the state. The final variable that captures shocks to fundamentals is average commercial failures, measured as the average (over the 1920s) of the liabilities of failed commercial establishments in a given state divided by the state's total wealth in 1922.

There are two variables that control for state characteristics in the model: the average proportion of the population in agriculture, measured as the average (over all years) of the population engaged in agriculture divided by total population in the state, and the proportion of banks in chains, measured as the number of banks that were part of chains in 1925 divided by the total number of banks in the state also in 1925.

Lastly, the model includes two regulatory variables: branching, an indicator variable equal to 1 if the state allowed for the establishment of branches in the state, and 0 if it did not, and deposit insurance, an indicator variable equal to 1 if the state had adopted some form of deposit insurance before the 1920s, and 0 if it did not.

Table 8 presents the regression results of the number of panics during the 1920s per state, and the independent variables are the ones discussed above.[19] The regressions estimated are the Poisson regressions, since the dependent variable is a count variable.[20]

[19] Average bank failures, average commercial failures, and branching data are from Ramirez and Shively (2012); risk is computed using Bodenhorn (1995) data; bank density and bank size are computed using Flood (1998) data; deposit insurance is from the FDIC *Annual Report* (1955, 1956); average proportion of the population in agriculture

Regression 1 is the most complete specification and includes all of the discussed covariates. The results are mostly consistent with expectations. Bank density and bank size (bank assets per bank) significantly affect the incidence of bank panics. Consistent with expectations, higher bank density is associated with a higher incidence of panics, holding all else constant. In addition, the results show that bank size is negatively associated with the incidence of panics. This result suggests that panics were less likely to occur in states with relatively larger banks.

Next we consider the variables that capture shocks to economic fundamentals. Two of these three variables (risk and average commercial failures) are positive and statistically significant at the 10 percent level.[21] This result implies that panics were more likely to take place when underlying economic fundamentals were relatively weak. Thus, the results lend support to the Calomiris and Gorton (1991) asymmetric information theory of the causes of banking panics.

Regarding the state characteristic variables, the regressions indicate that the share of the state's population in agriculture does not seem to be associated with a higher incidence of banking panics. At first, this may seem somewhat surprising. After all, as noted above, previous research has documented that bank failures of the 1920s were more frequent in agricultural states (Alston, Grove, and Wheelock, 1994). The lack of significance, however, is not unexpected if the variables that control for fundamental economic shocks already absorb the adverse effects of exposure to the agricultural industry.

The regressions also indicate that chain banking appears to reduce the incidence of banking panics. Although the estimated coefficient and significance vary somewhat depending

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is computed using the U.S. Bureau of the Census (1975), Series K 17-81; proportion of banks in chains is computed using Willis (1934) data; state total wealth is from the *Statistical Abstract of the United States* (1925), Table 281.

[20] An alternative modeling technique for count variables is the negative binomial regression. With limited dispersion in the dependent variable, the Poisson regression is generally more efficient. Nonetheless, both procedures yielded very similar results. For more on these types of regression, see Hilbe (2011).

[21] The average bank failures variable is positive but not significant at standard levels.

on the regression specification considered, the overall effect seems to be negative. Thus, a higher proportion of banks operating in chains is associated with a lower incidence of panics. This result suggests that chain banking was an effective mechanism for reducing the likelihood of panics. This result is consistent with the notion that banks operating in chains were more likely to support one another in times of panic-driven distress, possibly by channeling funds to institutions that otherwise could have been victims of a run.

Of the two regulatory variables considered, only deposit insurance is statistically significant at the 5 percent level. The fact that the estimated coefficient is negative suggests that deposit insurance appears to be associated with a lower incidence of banking panics. This result is consistent with the findings of Chung and Richardson (2006), who show (as mentioned above) that deposit insurance reduced the number of bank failures due to runs, although it did increase the number of failures due to mismanagement (because of the moral hazard problem it created among state banks).

6. Conclusion

The 1920s saw an unusually high level of bank suspensions. Previous research has documented that the majority of those suspensions were driven by fundamental factors: agricultural sector problems, overbanking, government intervention, lack of appropriate regulation, etc. However, the role of runs and panics in explaining bank suspensions during the 1920s has, generally speaking, not been explored. In the research for this paper, however, access to a unique dataset has allowed us to investigate more deeply the presence of banking panics during the 1920s. Our first step was to construct clusters of bank suspensions that met specific criteria: 4 or more suspensions, each within a 10 mile radius of the preceding one and each 30 days at most after the preceding one. Our next step was to explore the reopening rate of the banks inside those clusters, and the role of runs preceding the suspensions. Those two criteria (reopenings and runs) allow us to argue that at least 40 percent of these clusters likely were episodes of local banking panics. Clusters in which suspensions exhibited relatively fast reopening rates were also much more likely to be identified in newspapers as being the victims of runs.

Our final step was to investigate the determinants of these local banking panics, finding that the incidence of panics was higher under adverse economic shocks. This finding lends support to the Calomiris and Gorton (1991) asymmetric information explanation of banking panics. A second finding is that panics were more likely to take place in states with a relatively high bank density and where banks were relatively smaller. This result is consistent with previous research that finds that overbanking increased banking system vulnerability (O'Hara, 1983). A third finding is that panics were less likely to occur in deposit insurance states, a result consistent with the work of Chung and Richardson (2006). A fourth and final finding is that chain banking was associated with a lower incidence of panics. This last result may be interpreted as indicating the benefit of chain banking in times of distress: the links enabled these banks to help each other out during times of panic, thereby avoiding panic-driven closures.

Our methodology for detecting local banking panics in clusters of 4 or more, and within a radius of 10 miles, can be extended for other cluster sizes and radii. Judging by the incidence of articles about bank runs in newspapers, it is likely that other forgotten panics in the United States also happened during the 1920s. Our plan is to investigate this issue in the course of future research.

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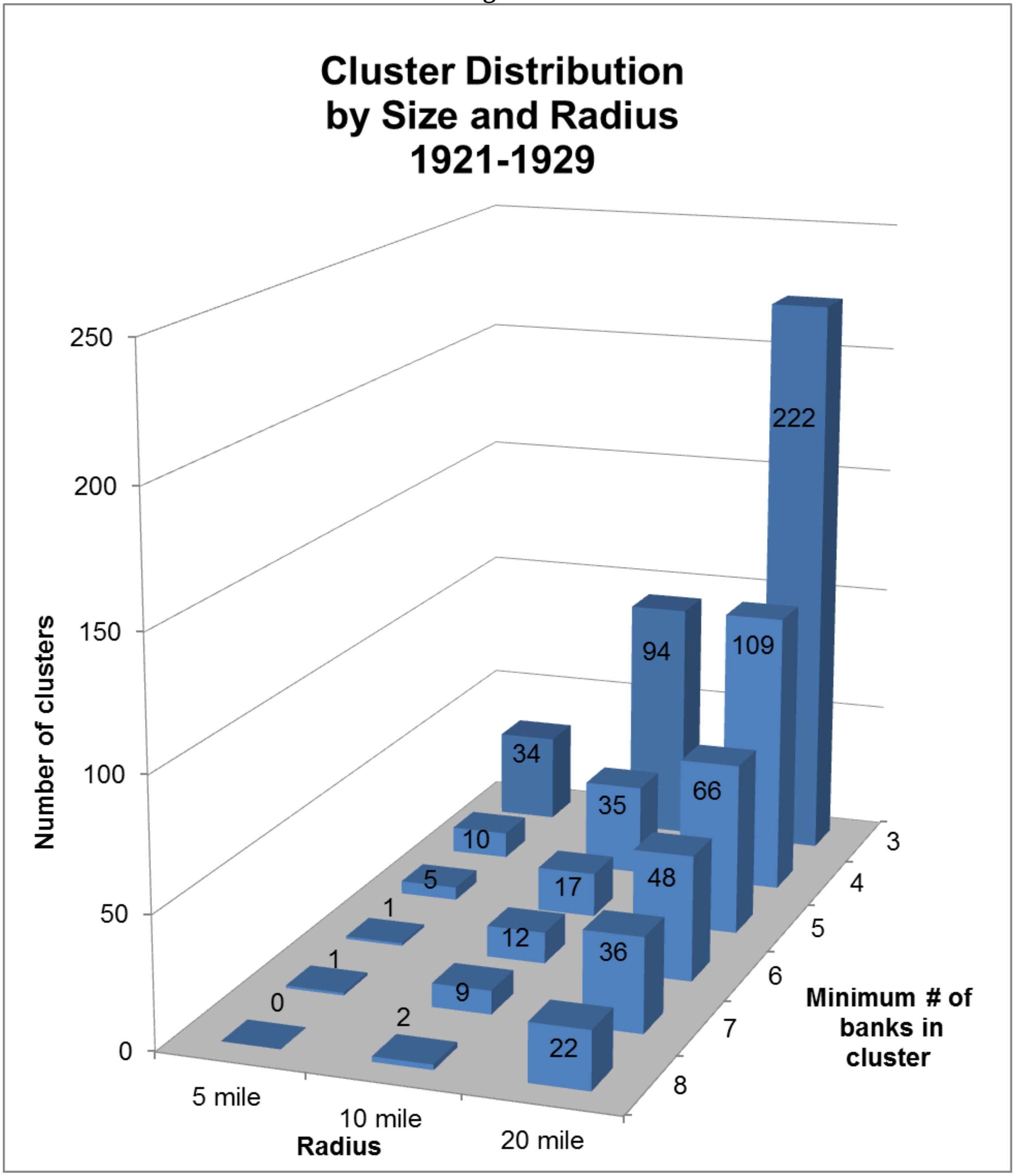
Figure 1



Notes: This figure shows the distribution of clusters by radius (5, 10, and 20 miles), and by minimum number of suspended banks per cluster.

Table 1

Distribution of 4-10 Clusters by State

State	Number	Month/Year			
Alabama	1	6/1929			
Colorado	1	12/1925			
Illinois	1	10/1929			
Indiana	1	2/1929			
Michigan	1	10/1926			
Nebraska	1	6/1929			
New Mexico	1	1/1924			
North Dakota	1	6-7/1929			
Oklahoma	1	11/1929			
Kansas	2	11/1926	2/1927		
Minnesota	2	11/1923	3-4/1926		
Missouri	2	3/1926	11/1926		
S. Carolina	2	11/1926	10/1928		
Georgia	3	7/1926	7/1926	7/1926	
South Dakota	3	1/1924	11/1926	11/1928	
Florida	6	7/1926	7/1926	3/1927; 2/1929;	5/1929; 7/1929
Iowa	8	11/1925; 12/1925	1/1926; 7/1926	11/1926; 11/1926	11/1926; 11/1928

Notes: Two clusters crossed state lines and therefore appear twice in the table.

Table 2
State Banking Laws Providing Flexibility to Reopen After Suspension

California	Whenever regulators have reason to think bank is in unsound condition, they may take possession and retain it until bank resumes business or is liquidated.
Colorado	A bank can voluntarily put itself in possession of commissioner; regulators to take charge of bank until receiver is appointed if bank has refused to pay depositors or is insolvent, However, if bank is only temporarily "embarrassed," regulators can refrain from appointing receiver so that bank can reopen (within 60 days).
Georgia	If a bank appears insolvent, it must be reported to the governor, who will order that it be taken over; if bank cannot resume business or liquidate debts, receiver is to be appointed.
Kansas	Commissioner takes action in a variety of circumstances; commissioner may take immediate possession of bank, or may appoint a special deputy to take charge of bank for not longer than 90 days. If bank cannot resume business, a receiver is appointed.
Michigan	In various circumstances, including failure to pay deposits, commissioner goes through AG to start receivership; commissioner can take control of bank pending receivership, but if stockholders of bank put it in condition to resume business, the court will discharge the receiver.
Missouri	If bank is insolvent, it is to be placed in receivership after immediate closure. But commissioner can appoint special deputy to act as receiver for 60 days; banks can voluntarily put themselves in hands of commissioner—indeed, must do so if threatened with insolvency.
Nebraska	A receiver is appointed under various circumstances, and if a bank is endangering depositors, regulators can take control immediately; but if bank becomes able to resume business, it can be permitted to reopen.
Nevada	A bank can reopen if its credit is repaired. Bank can voluntarily place itself in control of the board by putting a notice on its door.
New Jersey	When the commissioner moves against a bank through a court petition, if the court finds that the bank is insolvent and not able to resume business safely in a short time, the court can issue an injunction.
New Mexico	On closing a bank and examining it, examiner can ask for a receiver, but only if bank cannot resume business. Can have special deputy for 90 days pending receivership.
North Carolina	Commissioner can take over a bank if it is insolvent, unsafe, etc., and can order receivership, but commissioners can grant 60 days to correct irregularities.
Ohio	Failure to pay depositors means closure, but in certain cases the bank may show that allowing it to continue business will not endanger depositors, creditors, and stockholders, in which case receiver is not to be appointed.
Oklahoma	Banks can voluntarily place themselves in hands of commissioner; in general this leads to the bank's being wound up, but only after the examiner is satisfied as to its insolvency.
Oregon	Examiner's report can cause commissioners to take immediate possession of bank; board then investigates condition and recommends whether to proceed to receivership.
South Dakota	If on taking charge of a bank the examiner believes bank is only temporarily embarrassed, the examiner may allow such arrangements as will enable bank to resume business. The bank can voluntarily place itself under control of public examiner by putting notice on door.
Tennessee	The willful suspension of specie payment for 120 days in one year is grounds for forfeiture of charter and for receivership.
Texas	If a bank is operating in an unsound manner (including putting depositors' interests in jeopardy), superintendent institutes proceedings through AG. If condition is serious, superintendent may close bank and take charge of it. Superintendent can appoint special deputy who can take charge of bank for not more than 60 days before receiver appt. The bank may voluntarily put itself in hands of superintendent.
Washington	Examiner can close banks that appear insolvent; if on examination a bank cannot resume business or liquidate debts, receiver is appointed.
Wisconsin	Whenever a bank meets certain criteria, including suspending payment, the commissioner may take possession of bank and retain it until bank resumes business or is liquidated.

Source: Welldon (1910). For states not listed, the digest of the laws does not contain a relevant provision. Closer examination of the statutes may yield more information.

Table 3
Rate of Reopenings, 4-10 Clusters
Panel A: Distribution of Reopenings

	0-90 days	91-180 days	181-364 days	1 year or more	**Total**
0-25%	35.71%	7.14%	0.00%	0.00%	42.86%
26-50%	14.29%	14.29%	0.00%	0.00%	28.57%
51-75%	7.14%	0.00%	0.00%	0.00%	7.14%
76-100%	7.14%	7.14%	0.00%	7.14%	21.43%
Total	64.29%	28.57%	0.00%	7.14%	100.00%
Number of clusters with banks reopening					18
Number of clusters					35

Notes: This table presents all clusters with at least 4 banks in them and with each bank in the cluster being within 10 miles of the previous suspension. The first column refers to the percentage of banks in a cluster that reopened. The next four columns report the timing of the reopenings.

Panel B: Reopening Rates of Clusters versus All Other Suspended Banks

	Reopening at any time in future	Reopening within 6 months	Reopening within 3 months
Proportion of clusters with reopening banks	18/35	17/35	17/35
Proportion of suspended cluster banks that reopened	26%	23%	19%
Proportion of suspended non-cluster banks that reopened	15%	12%	9%

Panel C: Probability of Bank Reopening Regression Results

	Reg. 1: Reopening at any time in future	Reg. 2: Reopening within 6 months	Reg. 3: Reopening within 3 months
Bank in 4-10 Cluster	0.681	0.731	0.845
	(0.173)	(0.182)	(0.196)
	[0.000]	[0.000]	[0.000]
Marginal Effect	0.110	0.103	0.098
	(0.033)	(0.032)	(0.029)
	[0.001]	[0.001]	[0.001]
No. of Observations	5621	5621	5621
Chi-2	13.76	14.11	15.74
Prob> Chi-2	0.000	0.000	0.000

Logit regressions of bank reopening on 4-10 cluster indicator variable. Dependent variables: Does the bank reopen at all? (Reg. 1) Does the bank reopen within 6 months? (Reg. 2) Does the bank reopen within 3 months? (Reg. 3) Independent variable: Is the bank in the 4-10 cluster? ("Bank in 4-10 Cluster") "Marginal Effect" is the estimated incremental probability of reopening, given that the bank is in the cluster. Standard errors are in parentheses, p-values in brackets.

Table 4
The Odds That a Bank Suspension Is Identified as the Victim of a Run

	Logistic Regression 1	Logistic Regression 2
Bank in 4-10 cluster	17.816	15.917
	(4.264)	(3.951)
	[0.000]	[0.000]
Log (Deposits)		1.921
		(0.229)
		[0.000]
State Fixed Effects Included?	YES	YES
No. of Observations	3108	3075
Chi-2	270.44	299.11
Prob> Chi-2	0.000	0.000

Notes: This table presents logistic regression results of determinants of a bank run for all bank suspensions during the 1921-1929 period. Dependent variable: Equals 1 if newspaper article indicates that suspended bank experienced a "run" or "heavy withdrawals." Independent variables: "Bank in 4-10 cluster" is an indicator variable equal to 1 if the bank was in one of the 4-10 clusters. "Log(Deposits)" is the log of bank deposits at the time of suspension. Reported coefficients are the estimated odds ratio. Thus, 29.992, for example, indicates that if the suspended bank is in the 4-10 cluster, it is nearly 30 times more likely to be identified as being the victim of a bank run, relative to bank suspensions outside the clusters. Standard errors are included in parentheses under the estimated odds ratios. P-values are included in brackets under the standard errors.

Table 5
Breakdown of Bank Suspensions by "Run" Identification and Cluster Association

		Suspension in Cluster? No	Suspension in Cluster? Yes	Total
Newspaper identifies a run?	No	3,959	132	4,091
	Yes	50	50	100
Total		4,009	182	4,191

Table 6
Bank Reopenings and Bank Runs

	Reg. 1	Reg. 2	Reg. 4
Does Bank Reopen?	2.632	1.269	1.174
	(0.579)	(0.353)	(0.334)
	[0.000]	[0.392]	[0.572]
Does Bank Reopen? x Is Bank in Cluster?		19.976	20.074
		(8.296)	(8.676)
		[0.000]	[0.000]
Log (Deposits)			2.075
			(0.243)
			[0.000]
State Fixed Effects Included?	YES	YES	YES
No. of Observations	3108	3108	3075
Chi-2	157.76	210.58	249.21
Prob> Chi-2	0.000	0.000	0.000

Notes: This table presents logistic regression results of determinants of a bank run for all bank suspensions during the 1921-1929 period. Dependent variable: Equals 1 if newspaper article indicates that suspended bank experienced a “run” or “heavy withdrawals.” Independent variables: “Does Bank Reopen?” is an indicator variable equal to 1 if the bank reopens within a year, 0 otherwise. “Bank in Cluster?” is an indicator variable equal to 1 if the bank was in one of the 4-10 clusters. “Log(Deposits)” is the log of bank deposits at the time of suspension. Reported coefficients are the estimated odds ratio. Standard errors are included in parentheses under the estimated odds ratios. P-values are included in brackets under the standard errors.

Table 7
Identified Local Banking Panics

State	Begin Date	End Date
Minnesota	26/Nov/1923	26/Nov/1923
South Dakota*	11/Jan/1924	25/Jan/1924
New Mexico*	28/Jan/1924	29/Jan/1924
Missouri*	4/Mar/1926	15/Mar/1926
Georgia*	12/Jul/1926	16/Jul/1926
Florida*	15/Jul/1926	16/Jul/1926
Iowa*	9/Nov/1926	27/Nov/1926
South Dakota	10/Nov/1926	7/Jan/1927
Florida*	24/Feb/1927	14/Mar/1927
Kansas	24/Feb/1927	24/Feb/1927
Indiana*	13/Feb/1929	14/Feb/1929
Alabama*	27/Jun/1929	6/Jul/1929
Florida*	17/Jul/1929	17/Jul/1929
Illinois*	10/Oct/1929	18/Oct/1929

Note: An asterisk indicates that at least one bank in the cluster is identified as being the victim of a run according to newspaper reports. The Georgia and Iowa panics are a combination of 3 clusters taking place within a few days of each other. They are therefore classified as one local panic.

Table 8
Determinants of Banking Panics

	Regression 1	Regression 2
	Coefficients	Coefficients
Bank Density	0.482	0.474
	(0.271)	(0.261)
	0.076	*0.070*
Bank Size	-4.181	-3.699
	(1.580)	(1.431)
	0.008	*0.010*
Risk	0.378	0.428
	(0.204)	(0.226)
	0.065	*0.058*
Bank Failures	0.692	0.599
	(0.519)	(0.483)
	0.182	*0.215*
Commercial Failures	0.520	0.560
	(0.313)	(0.327)
	0.097	*0.087*
Ag Pop	-1.038	-0.981
	(0.641)	(0.659)
	0.105	*0.136*
Chain Prop	-0.869	-0.770
	(0.456)	(0.443)
	0.057	*0.083*
Dep Ins	-0.474	-0.468
	(0.190)	(0.191)
	0.013	*0.014*
Branch	0.295	
	(0.318)	
	0.355	
No. Obs	44	44
Chi-Sq	36.23	35.58
Prob>Chi2	0.000	0.000

Notes: Poisson regressions. Dependent Variable: number of banking panics between 1921 and 1929 per state. Independent variables: "Bank Density" equals the average (computed over the 1921 to 1929 period) of the total number of banks in the state divided by the state's population in 1920. "Bank Size" equals total bank assets divided by total number of banks, averaged over the 1921 to 1929 period. "Risk" is the spread of the state interest rate over the mean interest rate for all states, averaged over the 1921 to 1929 period. "Bank failures" is the total liabilities of failed banks divided by total deposits at the state level, averaged over the 1921 to 1929 period. "Com. Failures" is the total liabilities of failed commercial establishments divided by total state wealth in 1920, averaged over the 1921 to 1929 period. "Ag Pop" is the proportion of the state's population in 1920 involved in agriculture. "Chain Prop" is the total number of banks in chains divided by the total number of banks in the state. "Branching" is an indicator variable equal to 1 if the state permitted branch banking, 0 otherwise. "Deposit Insurance" is an indicator variable equal to 1 if the state had a deposit insurance scheme, 0 otherwise. Standard errors are presented in parentheses under the coefficients, and the p-values are reported in italics under the standard errors. All independent variables have been standardized; thus, the coefficients are comparable.