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Community Cohesion and Bank Panics

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## **Abstract**

Bank panics attract scholarly interest because they reflect distrust of each bank that experiences a run as a result of diffusion of information whereby rumors about bank runs trigger additional runs elsewhere. However, the contagion of bank runs is highly selective for reasons that are unrelated to the financial strength of the individual banks. This presents a puzzle that extant theories on institutions and reputations cannot fully explain. To solve this puzzle, we turn to the characteristics of the community in which the banks operate. We develop theory on how communities with diverse affiliation structures and economic inequality have weaker community cohesion and communication, making such communities less likely to experience widespread distrust and hence bank runs. We test hypotheses on the effects of community ethnic diversity, national origin diversity, religious diversity, and wealth inequality using data from the great bank panic of 1893, and find strong community effects on bank runs. The findings suggest that the contagion of distrust in organizations following adverse events is channeled by community differences as well as organizational differences.

Keywords: Diffusion; Distrust; Community Diversity; Demographic Heterogeneity; Bank Panic;  
Bank Run

The recent turmoil in financial markets has been a reminder of how the banking system that sits at the core of modern economies is vulnerable to events involving a breakdown in trust. The economic crisis caused by undisciplined management of financial institutions undermined public trust in the banking system. Indeed, according to the Financial Trust Index (Guiso, Sapienze and Zingales forthcoming), the U.S. public's overall trust in the nation's financial system has significantly declined since the financial crisis in late 2008. Because trust in financial institutions is essential for financial intermediation, actions resulting from distrust, such as increased fund withdrawals from banks and reduced investment activity, have led to a deepening downturn in the economy, with consequences that are still unfolding.

In the past, breakdowns in trust tended to occur between depositors and banks, leading to mass deposit withdrawals—often referred to as a ‘bank run’ (Smith 1991; Wicker 2000). A ‘bank panic’ occurs when a run spreads to a substantial number of banks in a short time period, often triggering an economic crisis. In the 1893 bank panic in the U.S. analyzed here, for example, the subsequent economic crisis caused a decline in real earnings of 18 percent from 1892 to 1894 (Hoffmann 1956). In the modern era, bank panics are less frequent and devastating thanks to deposit insurance policies and other instruments that alleviate the impact of a bank run, but bank runs are by no means extinct. Runs on deposits triggered the nationalization of the U.K. bank Northern Rock in 2007, led to a \$16.7 billion drop in Washington Mutual deposits that eventually resulted in its seizure in 2008, and occurred in Greece, South Korea, and Spain as recently as 2012.

Bank panics are informative for organizational theory because they reflect an abrupt and selective decline in trust in banks, which are members of an organizational form that is taken for granted and hence rarely comes under scrutiny (Meyer and Rowan 1977). Bank panics spread in ways suggesting the *diffusion of information* as an underlying mechanism, but the relative scarcity of banks that experience a run indicates selectivity in the diffusion pattern or in the reaction to the information. Theory on information diffusion and communication shed light to the spread of bank runs in a bank panic, but it does not explain the selective response of depositors to bank runs elsewhere. Other existing theories and evidence also appear to be unable to fully explain this process. Research on deinstitutionalization predicts a gradual process rather than a precipitous decline, and it predicts broad

rather than selective effects (e.g., Ahmadjian and Robinson 2001; Oliver 1992). Research on reputation predicts a decline in trust of the specific firm that has failed to deliver on its promises (Rhee and Haunschild 2006), but does not explain how this leads to a decline in trust of other firms as well. Thus there is one theory explaining spread of distrust but not selectivity, and one theory explaining selective distrust but not spread of distrust. Economics is also split between theory that predicts all-encompassing contagion (Bikhchandani, Hirshleifer and Welch 1992) and theory that predicts single-firm loss of trust (Diamond and Dybvig 1983).

In a bank panic, the contagious nature of bank runs suggests that depositors generalize from an individual bank to banks as a category, even in the absence of evidence of problems at the category level. Thus the contagion of a bank run that leads to a bank panic is informative for theories of categorization and stigmatization (Jonsson, Greve and Fujiwara-Greve 2009; Pontikes, Negro and Rao 2010; Zuckerman 1999). However, not all banks are equally affected by this process; some become the target of a run while others of similar financial standing escape that fate. Indeed, even in the major bank panics, the vast majority of banks do not experience a run. This presents a paradox whereby information diffusion about bank runs triggers additional runs elsewhere, but these runs are highly selective for reasons that are unrelated to the financial strength of the individual banks (Dupont 2007). The paradox deepens with the realization that local banks, which were dominant during the 1893 bank panic, are strongly embedded in their communities (Marquis and Huang 2009; Marquis and Lounsbury 2007), which could (and often did) protect them against loss of trust due to bank runs elsewhere. Our theoretical and empirical task is thus to explain *how broad diffusion of information about bank runs resulted in selective targeting of certain banks*.

To do so, we posit that a breakdown of trust in an organization is caused by a change of opinion at the community level as community members communicate and interpret information about adverse events related to similar organizations elsewhere. Organizations are strongly dependent on the communities in which they are embedded, as the communities provide the resources for the organizations and act as the context in which opinions about them are formed (Audia, Freeman and Reynolds 2006; Marquis and Huang 2009; Schneiberg, King and Smith 2008). This calls for theory on how the individuals in a community come to agree on a changed evaluation of an organization in their

midst based on the information about the events experienced by similar organizations. This theory involves interpersonal diffusion of information, and it must incorporate an explanation for why communities differ in whether the diffusion causes a negative assessment of an organization to spread widely.

We examine how the affiliation structures of communities affect diversity of opinion (Huckfeldt, Johnson and Sprague 2004) and consequently the likelihood that a community will reach a revised view of the organization when it is exposed to newly-acquired information. Individuals have multiple social affiliations that serve as sources of identity, social network hubs, and reference groups for the formation of opinions (Erickson 1988; Friedkin and Johnson 1990; Tajfel and Turner 1986). A community with a low diversity of affiliations is more cohesive, but it implies a potential for a swifter and more complete collective revision of the community's opinion on a focal organization. Thus negative news about a bank is more likely to affect the opinions of the individuals in a homogenous social community, consequently increasing the risk of a run on the bank in that community. We also examine how economic inequality among community members will affect the likelihood of a bank run. Like affiliation structures based on social characteristics, economic stratification reduces cohesion and hence the likelihood that the community will collectively agree on a negative assessment of the bank.

Thus the theory posits a novel process that determines the effect of negative information about banks elsewhere on a local bank. Horizontal and vertical social differences within a community affect the community's trust in the bank. Breakdown in community-bank trust or intra-community trust, in turn, can spur a bank run. In developing this argument, we first discuss the general drivers of decline in trust before focusing on the conditions that produce diversity vs. uniformity in opinions in communities.

### **Diffusion of Distrust**

A bank panic is an event that involves a wide-spread bank runs, but even in major bank panic only a small number of banks are affected. This phenomenon of selective spread of distrust is interesting and potentially important because it points out a gap in our understanding of how

individuals judge organizations after receiving negative information. To fill this gap, we need to examine the predictions and limitations of institutional theory. Institutional theory posits that trust in institutions such as organizational forms is legitimized by societal beliefs in the form of “rationalized and impersonal prescriptions that identify various social purposes as technical ones, and specify in a rulelike way the appropriate means to pursue these technical purposes rationally” (Meyer and Rowan 1977: 343-344). Such beliefs are particularly important for the viability of an organizational form when there are alternative means for performing the same activities, or doubts about whether the activities should even be done by that form of organizations. For example, people can make loans privately and ‘deposit’ money by hiding it away (Ramirez 2009); the early life insurance industry in the US was held back by the view that payment for loss of life was immoral (Zelizer 1978); the debate pitting the profit motive against community self-help divided insurers into a for-profit and a mutual form (Schneiberg et al. 2008).

Legitimacy relies on a logic of good faith in the organization coupled with non-inspection or ceremonial inspection of its activities (Meyer and Rowan 1977). In an environment that has trust in the effectiveness of schools, for example, tests are used for the purpose of evaluating students; when trust breaks down, tests are used to evaluate the schools. This is not just a state’s reaction to apparent problems in a regulated sector, but it is also a reflection of changed societal attitudes, as seen in political debates and parental pressure for more transparency in school test results (Phelps 1998). Legitimacy of the organizational form is thus a strong benefit for individual organizations, as they may otherwise have to submit to closer inspection of their behaviors and outcomes, which in itself consumes attention and resources (e.g., Elsbach 1994; Elsbach and Kramer 1996) and may yield results that further delegitimize them (Jonsson et al. 2009).

Institutional theory makes predictions on delegitimation that relates to the loss of trust in an organizational form. In a classic paper, Oliver (1992) distinguishes between dissipation and rejection of institutions, where dissipation refers to a gradual atrophying, while rejection denotes a rapid drop in legitimacy as a result of direct attacks. She distinguishes between political, social and functional pressures, and notes that functional pressures are present when “dissonant information or unexpected, irrefutable events in the organization’s environment (...) emerge to discredit or challenge the utility of

the operating assumptions of organizations” (Oliver 1992: 574). This approach assumes that the pressures are directed against the institution as a whole rather than against specific organizations because salient negative events raise questions about whether organizational form as a whole can be trusted. This assumption does not match events such as bank panics, which involve in loss of trust for a minority of banks, while leaving most unscathed and preserving the organizational form of banking rather than questioning its utility.

An alternative conceptualization of the process is to view it as a *selective diffusion process* in which negative information is spread and interpreted by the stakeholders of each organization. A formative research tradition deals with how problems in individual organizations spread through a process of stigmatization (Paetzold, Dipboye and Elsbach 2008). Negative information about a member of an organizational form leads to judgments of its efficacy that are not just limited to the specific organization, but affect other organizations of the same form (Yu, Sengul and Lester 2008). The underlying process is that individuals engage in sense-making efforts as a result of diffusion of negative information about organizations belonging to the same form as a specific organization they transact with. Although the individuals may be making judgments about the entire category, it is more plausible to assume that they are simply trying to assess the specific organization that they transact with. To aid the sense-making, they apply information about members of the same category through the same process as in the stigmatization of individuals (Pontikes et al. 2010; Pozner 2008) or organizations that share similar characteristics with negatively valued others (Jonsson et al. 2009). Thus there is a contagion effect from a single or a few adverse events to a potential loss of trust in specific members of the same organizational form (Iyer and Puri 2012; Jonsson et al. 2009).

When the process is conceptualized as a transition from an individual negative event to scrutiny of specific organizations of the same form, it no longer implies universal or even widespread loss of trust in the organizational form. Sense-making efforts yield different conclusions depending on systematic differences in circumstances as well as chance events, and thus do not predict homogeneous responses. This fits the observation of loss of trust in a minority of banks in a bank panic, but it does not say which ones will be affected. For the next step of making specific predictions on which banks will be affected, it helps to recognize that even a heavily institutionalized

organizational form (at the national level) like banking exists in a local social environment. The trust in each organization is influenced by its local community; thus society-wide diffusion of negative information can produce a wide range of reactions from individual stakeholders, and in turn generates a wide range of aggregations of these individual reactions to community responses. In any given community, opinion formation can result in bank-level effects that may be either harsher or milder than those seen in an average community. Naturally, what matters most for each bank is less the overall bank panic than whether or not it experiences a bank run. Likewise, theoretically it is important to predict individual bank runs because the conditions that drive them describe organizational vulnerability to the diffusion of negative information. Thus the next step in the argument is to consider how individual organizations differ in vulnerability to the diffusion of negative information.

### **Disagreement, Distrust and the Selective Diffusion of Bank Runs**

The central driver of contagion in a broad range of events, including bank panics, is interpersonal influence (Dupont 2007; Ramirez 2009; Smith 1991; Wicker 2000). Individual opinions are subject to social testing and validation through communication with others (e.g., Nisbett, Borgida, Crandall and Reed 1976), and hence interpersonal networks can influence changes of opinion (Erickson 1988). Consistent with this prediction, social networks have been shown to affect the pattern of withdrawals during a bank run (Iyer and Puri 2012; Kelly and O Grada 2000). However, the transition from interpersonal influence through a network to the outbreak of a bank panic or even a run on a local bank is not straightforward. If individuals influence each other through interpersonal networks, why is it that an individual concerned about an adverse event can convince a less-concerned individual to also see the event as serious but not the other way around? If networks selectively direct influence among friends and acquaintances, how can this result in a sufficiently high level of agreement in a community that a bank run ensues? The scarcity of bank runs even in the major bank panics shows that the process is not inevitable. This brings us back to our original question of why the diffusion of information about bank runs leads to runs on some banks but not others. While this outcome may be stochastic or driven by local variations unobservable to researchers, there may also

be variables driving them in a predictable way.

Local community structure has been shown to influence organizing attempts both for and against organizations (Greve, Pozner and Rao 2006; Ingram, Yue and Rao 2010; Marquis and Lounsbury 2007). This structure has two dimensions that influence the diffusion of information within the community. First, communities are connected through geographical space and social or economic ties, and these connections drive diffusion processes (Gaba and Meyer 2008; Greve 1998; Hedstrom 1994). Second, communities differ in their internal social structures along both the demographic dimension and the organizational one, and these differences yield varying degrees of community support for organizational founding and operation (Greve and Rao 2012; Schneiberg et al. 2008; Sorenson and Audia 2000). These differences make investigation of how the community interacts with existing organizations important.

The key question here is thus to understand the circumstances in which people who are concerned about a bank's future influence those who are not (and vice versa), thereby triggering (or halting) a run on the bank. An important clue is found in the literature on opinion formation in political science, where the problem of persistent opinion differences has led to sophisticated theories on the relationship between community structures and interpersonal influence (Huckfeldt et al. 2004). Individuals embedded in multiple social networks often experience a tension between different opinions because each network tends to form a specific opinion. For example, someone who attends a Catholic church but lives in a liberal neighborhood may be exposed to conflicting perspectives on abortion. In such cases, investigations of voting behavior and attitudes show that individuals have significant ability to preserve their original opinion (Huckfeldt, Beck, Dalton and Levine 1995; Huckfeldt and Plutzer 1993). This derives from their control over the frequency of interaction and content within their network—for example, a conservative Catholic may seek to avoid certain conversation topics when interacting with liberal neighbors, or even avoid interaction with them altogether. It is also fostered by the individual's ability to interpret ambiguous information as supportive of their own opinion (Lord, Ross and Lepper 1979; Vallone, Ross and Lepper 1979). Individuals process information selectively; they favor information that confirms their original beliefs but dismiss non-confirming information regardless of whether it is true (Klayman and Ha 1987;

Repenning and Sterman 2002).

Thus interpersonal influence alone does not necessarily lead individuals to change strongly-held opinions or beliefs, let alone alter the views of an entire community or a large part of it. For individuals to change their opinions, the interpersonal influence should be *consistent* across the individuals they communicate with and *persistent* over time. Therefore, to predict whether a community will swing from trusting its banks to not doing so, we need to examine whether a community possesses the characteristics that permit it to form consistent and persistent interpersonal influence.

### **Social Diversity and Economic Inequality Driving Bank Runs**

Research on diversity in communities provides useful insight into the community characteristics that have a direct bearing on the formation of uniform and persistent interpersonal influence (Alesina and La Ferrara 2000). It posits that people generally feel empathy toward individuals who are similar to themselves, and they prefer to interact with others who share similar characteristics such as interests, cultural norms and language. When they find themselves in a heterogeneous group with members of diverse backgrounds, they often self-segregate and choose not to participate in inter-community relationships (Alesina and La Ferrara 2000). Consequently, communities that have a diverse distribution on key demographic dimensions such as ethnicity will have lower rates of participation in community activities as a result of divisions and distrust among the groups.

This research predicts and shows not only lower levels of participation in community-wide activities, which might have been counteracted by higher levels of participation in activities within each demographic group, but it also shows that individual participation in any kind of community activity is lower (Alesina and La Ferrara 2000). Thus the overall collaborative climate is reduced, leading to a lower density of interpersonal ties of the kind that would be formed through interaction in community activities. Diversity has been found to produce lower levels of interpersonal trust and collaboration (Costa and Kahn 2003a; Habyarimana, Humphreys, Posner and Weinstein 2008), less collective action (Okamoto 2003), and lower provision of public goods such as education and

infrastructure (Alesina, Baqir and Easterly 1999; Tsai 2007). Accordingly, while a collaborative and trustful community is denoted as having high social capital, the central claim is that diversity reduces social capital.

It follows from this discussion that community diversity potentially reduces communication, allowing prior beliefs to be maintained. Thus, a highly diverse community provides a weak foundation for developing interpersonal influence that is strong enough to swiftly change the community's beliefs about a local bank even when the community members are presented with threatening rumors about banks, such as rampant bank runs elsewhere. This does not imply that an individual in such a community will not be concerned by the news about bank runs elsewhere, but it lowers the potential for the spread of such evaluations and hence of a run on the banks in the local community.

*Ethnic Diversity.* What type of diversity matters in the diffusion of information? The extant work has focused on ethnic and religious diversity as most likely to lead to cleavages in a community (e.g., Alesina, Devleeschauwer, Easterly, Kurlat and Wacziarg 2003). In particular, ethnic diversity is of great importance to interpersonal influence because it is fundamental to the way individuals identify themselves and develop communication boundaries. Studies of ethnic diversity show that it negatively influences trust and other attitudinal indicators of social cohesion. A high level of ethnic diversity in a community reduces social solidarity and social capital because it discourages reliance on other community members. Consequently, in an ethnically diverse community, individuals develop lower levels of interpersonal trust and exhibit less support for a collective action. Harris et al. (2001) describe a phenomenon they call “the Florida effect” in the context of public school funding, whereby in states with a high ethnic and racial diversity like Florida, the typical taxpayers who contribute to public school funding are white senior citizens, while the beneficiaries of such funding are often children of Hispanic immigrants. In such an ethnically diverse environment, people become less supportive of school funding. Considerable empirical evidence exists to support this line of logic (e.g., Putnam 2007; Stolle, Soroka and Johnston 2008).

*Diversity of National Origin.* It is possible to extend this argument to immigrant societies such as that of the United States in the 19<sup>th</sup> century. Individuals in such societies tend to display an

attachment to their country of origin, as seen in patterns of co-location patterns with co-nationals, use of their mother tongue, and informal activities such as clubs delineated by national origin (Duncan and Lieberman 1959; McPherson, Smith-Lovin and Cook 2001). In their study of the bank panics of 1854 and 1857, Kelly and O Grada (2000) reported that a crucial factor in determining whether individual depositors panicked was the social networks formed by country of origin. Taken together, these arguments suggest that ethnic and national origin diversity will discourage the formation of uniform and persistent interpersonal influence within a community that is required to change the opinion of community members when they are exposed to new information. Thus in a community with high ethnic and national origin diversity, news about a run on a bank elsewhere is less likely to shape a community-level opinion that is strong enough to reduce trust in the local banks. Hence we hypothesize:

H1: Banks in a community with high ethnic diversity are less likely to experience a bank run.

H2: Banks in a community with high national origin diversity are less likely to experience a bank run.

*Religious Diversity.* Scholars of various academic traditions have posited that religion promotes intragroup trust (i.e., interpersonal trust within the religious group) but may discourage intergroup trust (i.e., interpersonal trust across religious groups) (e.g., Iannaccone 1994; Ruffle and Sosis 2006). Religious diversity has a special significance because it involves congregating at regular intervals and hence has a strong influence on associational patterns and the spread of information. Such patterns are important to research on the link between organizational structures for community activism and community-level outcomes (Greve et al. 2006; Schneiberg et al. 2008). Moreover, religious groups can assert a direct pressure on the local community or the actors therein (Tsai 2007), and encourage different cooperative behaviors at the community level (Goldin and Katz 1999).

In a bank panic, religion plays a particularly important role because it not only influences individuals' trust and beliefs, but church services also provide time and physical space for them to meet with other church members and confirm their shared identity, spread news or rumors, and arrive at a common interpretation of ambiguous events. When a community consists of diverse religious

groups, the resulting fragmentation of church services in the community will limit the formation of consistent and persistent community-wide opinions about banks, since each group forms a distinct opinion that members maintain when encountering members of other groups. Such behavior has been seen through effects of religious affiliation on withdrawals in a bank run (Iyer and Puri 2012), though it has not been documented in a larger bank panic. The fact that religious assemblies occur at similar times helps maintain this diversity of opinion because it prevents a cascade of news or interpretations from one religious community to the next (Bikhchandani et al. 1992). Thus we predict:

H3: Banks in a community with high religious diversity are less likely to experience a bank run.

*Economic Inequality.* Inequality in wealth and income levels has also interested research on diversity, which generally sees greater economic inequality as leading to less intragroup trust and community participation (Alesina and La Ferrara 2000). Individuals often develop distrust toward those in other economic classes because they may believe members of different economic classes have conflicting economic interests and will act only according to their own interest, even at the cost of those in other economic classes. Thus, when members with different levels of wealth coexist in a community, they tend to withdraw from collective life and reduce their involvement with community activities such as community service groups or charity. In line with this argument, La Ferrara (2002) found that members of communities with high wealth inequality are less likely to participate in community groups because they perceive those groups to perform poorly due to mismanagement and are concerned about being misinformed by individuals with dissimilar economic interests. Similar findings are reported by Lindert (1996), Goldin and Katz (1999), and Costa and Kahn (2003b) to show that great income inequality leads to low community group membership, volunteering, and trust.

Thus, income inequality increases community members' tendency to sort into more homogeneous groups, which consequently decreases communication across different economic strata. The low level of communication across different economic strata is further reduced by fear of status contamination among the members of higher economic strata when considering social affiliation with the lower ones (Podolny and Phillips 1996). La Ferrara (2002) reported that wealthy people are less likely to participate in community activities than poor people in an economically heterogeneous

community, a finding that is consistent with the notion that higher economic status individuals may limit communication with lower economic status individuals due to the fear of status contamination.

As a result, similar to the social diversity, the economic stratification resulting from high wealth inequality of a community should also reduce the likelihood of a bank run in the community via two mechanisms. First, it will put a brake on the spread of the rumors about bank runs by limiting the communication among the individuals in different economic strata. Second, the fragmentation resulting from economic stratification will reduce the chance of forming a community-wide agreement about the individual banks in the community or banking in general. Taken together, these arguments lead to our final hypothesis:

H4: Banks in a community with high economic inequality are less likely to experience a bank run.

### **The Bank Panic of 1893**

We have proposed a general theory of contagion of decline in trust and its effects on specific organizations. While the theory has potentially broad applications, here we use it to examine the bank panic that occurred in the US between April and August of 1893. This panic was widespread and had significant economic consequences (Hoffmann 1956), yet it is not considered to be among the most serious financial crises in the US economic history (Reinhart and Rogoff 2009). Because the bank correspondence system worked effectively to cushion the blow, the panic on the customer side was not mirrored by financial contagion on the banking system side. Short-term funds were made available for banks that had liquidity problems, which served to slow down and ultimately halted the bank runs (Carlson 2005). These circumstances distinguish the 1893 panic as a customer-driven rather than a bank-driven or financial system-driven bank panic, and thus it is an especially suitable context for testing our hypotheses.

It is worth restating the reasons for bank panics in general, and for the 1893 panic in particular, that have been cited in previous work. Bank runs are generally thought to stem from

illiquidity.<sup>1</sup> In the absence of confidence about whether their bank will have sufficient liquid funds to serve withdrawal requests, depositors may start a run on the bank in order to withdraw their money before it runs out of funds (Diamond and Dybvig 1983). Such runs are in turn influenced by the strength of the customer relationship with the bank and by interpersonal networks (Iyer and Puri 2012). This explains how a run on an individual bank occurs; however, it needs extension in order to explain the spread of bank runs across communities, which occurs in a bank panic. One attempt to make such an extension posits that individual banks act in the same way as depositors with respect to their reserve cities (Smith 1991). This model of how bank runs spread through the financial system is applicable to modern banking and financial crises because of the strong component of financial system contagion. This type of interbank contagion, however, did not occur in the 1893 panic, allowing us to focus on interpersonal contagion.

Alternative explanations center on adverse conditions in other parts of the economy. Banks with much commercial lending business can become insolvent if they have significant exposure to bad loans resulting from the poor economic condition of their clients' industries. Individual investors may not know the actual risk exposure of their bank but may react to this uncertainty by withdrawing their deposits. If the economic crisis is geographically widespread, the bank panic could become similarly widespread. This has been suggested as one cause of the 1893 panic, with business failures being the trigger (Carlson 2005). However, Carlson's investigation relied on aggregate data on firm and bank failures, which may have yielded an incomplete picture of the bank runs during the 1893 panic.

Finally, liquidity concerns or solvency concerns may trigger a run on an individual bank, but a few individual runs turns into a bank panic as depositors hear news of runs elsewhere and assume that their bank is similarly at risk. This is a specific form of the contagion hypothesis formulated above. Contagion among depositors has been implicated in the 1893 bank panic. For example, a study of Kansas, which maintained better public information about banking conditions than other states,

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<sup>1</sup> Illiquidity means having insufficient cash to meet anticipated requirements *now*. Banks lend money for longer terms than they borrow it, making them vulnerable to liquidity problems unless reserve loans or interbank loans can step in. Illiquidity is different from insolvency in that insolvency means that a firm can no longer meet its financial obligations to its lenders. Thus illiquidity may be temporal but insolvency often leads to bankruptcy.

showed that a broad range of variables that would indicate solvency or liquidity differences among banks failed to predict deposit movements, which was taken as evidence of uninformed withdrawals driven by depositors' fear (Dupont 2007). A notable feature of this study is that state-level disclosure rules meant that depositors in Kansas, unlike those in other states, would have been able to compare the financial condition of their local banks by reading the newspaper, yet this information appears not to have influenced the runs. Additional evidence comes from findings on changes in depositor behavior in the areas worst hit by the 1893 bank panic (Ramirez 2009): areas with severe deposit contractions saw an increase in newspaper stories on "hidden money" (money not deposited in the bank), suggesting that the withdrawals represented a general distrust in banking rather than targeting of weak banks. The wide geographical spread of the bank runs also indicates that contagion was an important element of the 1893 panic (Wicker 2000).

The 1893 bank panic has two advantages from the modeling perspective. First, bank runs are typically measured using bank suspensions. Banks faced with a bank run temporarily suspend deposit withdrawals, which is called suspension of convertibility (in short, bank suspension). Bank suspension was introduced to prevent immediate bankruptcy of the banks experiencing bank runs by allowing them to afford time to procure funds to pay back their deposits. Suspended banks are usually allowed to continue their operations that do not reduce their capital level. It is important to note that bank suspension is different from bank failure; a bank suspension occurs when the bank has lost liquidity through mass withdrawals of deposits (e.g., Calomiris and Gorton 1991; Carlson 2005; Dupont 2007), while banks that become insolvent move directly to failure without a preceding suspension.

Although bank suspensions are well-accepted as a way to capture bank runs in finance research and have been used in many prior studies of bank panics in economic history, banking and finance (e.g., Calomiris and Mason 1997; Carlson 2005; Dupont 2007), a suspension does not indicate a panic if it occurs for bank-specific reasons. The 1893 bank panic context greatly alleviates this potential issue. Bank suspension is a rare event that usually does not occur under normal economic conditions, but during the panic of 1893, 503 banks were suspended just during a four-month period (May-August 1893). This abrupt increase in the number of bank suspensions is a unique event in the U.S. banking history. While the abnormally large number of suspensions could in principle have been

caused by factors such as insolvency caused by a bank's poor practices (which was the leading cause of the financial crisis in 2008), banking research and historical reports unequivocally state that the suspensions during the 1893 bank panic were caused by bank runs. The regulating agency reported, for example: "*Many banks after paying out all the money in their vault were suspended and passed into the hands of the Comptroller. With a full knowledge of the general solvency of these institutions and the cause which brought about their suspension, the [suspension] policy was inaugurated...*" (Annual Report of the Comptroller of the Currency, 1893: p. 10). Later, Dupont (2007) found no statistical difference between the suspended banks and surviving banks in the 1893 panic; interestingly, the suspended banks were actually healthier than surviving banks as they had larger deposits and capital and better capital ratios (p. 426). This implies that the banks were not suspended because they were financially weak, but rather because depositors blindly rushed to withdraw their funds. This allows us to unambiguously link bank suspensions with bank runs that in turn occurred in the context of a broader bank panic.

Second, the presence of an effective mechanism such as deposit insurance that protects depositors from loss of their fund could significantly influence our analysis as it could affect how depositors would behave in a bank panic. Before the advent of Federal Deposit Insurance Corporation (FDIC) in 1934, there was no formal deposit insurance plan at the federal level. At the state level, several states experimented with deposit insurance as early as in 1829 to protect communities from the economic disruptions caused by bank failures and to protect depositors against losses. In the majority of cases, however, these deposit insurance plans proved to be ineffective, and most of these programs were discontinued by the state governments by the 1893 Panic. These state deposit guarantee programs were managed in a manner analogous to chapter 7 bankruptcies of non-bank corporations. Insolvent banks were closed and the state banking authority liquidated the assets of the failed bank and repaid the depositors and other creditors of the bank. The average liquidation took more than four years, during which depositors lost access to their funds (DeYoung, Kwalik and Reidhill 2011). For example, depositors of national banks that failed in 1929 received only 66.12 percent of their funds; only about 20 percent of this amount was returned during the first year (Anari, Kolari and Mason 2005). Thus depositors of a failed bank had to bear large costs (in addition to the

direct costs of losing a substantial portion of their actual deposits) even when the bank was under the state deposit guarantee program because they had to establish new banking relationships, pay off their loan from the closed bank, and losing the liquidity in their deposit accounts. For these reasons, research in finance generally suggests that the state deposit guarantee programs were ineffective in deterring banking panics (DeYoung et al. 2011). Given the existing evidence, the stage seems set for more careful investigation of community vulnerability to bank runs in the context of a contagious bank panic.

## **Data Sources and Variables**

### **Sample and Data**

Data on bank suspensions were obtained from the January 1894 issue of *Bradstreet's*. This issue contains a complete list of suspensions that occurred during the 1893 bank panic, including the information on whether the bank had failed following the suspension or had reopened. All bank suspensions were coded, for a total of 604 nationwide. *Bradstreet's* was also the source for stock and bond values. Data on the banks in the sample were obtained from the 1892 volume of *Rand McNally's Bankers' Directory*. The 1893 bank panic was mainly a mid-western and western phenomenon, with few suspensions in the east relative to its large bank population. Hence, to focus on the bank population most at risk and keep the data collection economical, full bank data were coded for the following 23 states: Arizona, California, Colorado, Idaho, Indiana, Illinois, Iowa, Kansas, Minnesota, Missouri, Montana, Nevada, New Mexico, North Dakota, Ohio, Oklahoma Territories, Oregon, South Dakota, Utah, Vermont, Washington, Wisconsin, and Wyoming. The data source gave the name of the village, town, township, or city of the bank, allowing a name match with census data. However, Oklahoma had to be dropped because the county names and boundaries it had as a territory did not match well with the modern boundaries. Thus our final sample included all the banks that existed in 1893 in 22 Midwestern and Western states, for a total of 6,639 banks.<sup>2</sup>

The county-level demographic data were coded from the 1890 census. These were at the

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<sup>2</sup> Although our sample was drawn from these 22 states, our diffusion model reflects the influence of bank runs that occurred outside these samples states in order to avoid any potential bias that may arise from the omission of such influence.

county level and were assigned to the census-designated places<sup>3</sup> (hereafter, referred to as “places” for simplicity), in which the focal bank was located through a two-step process. First, year 1890 places were matched with year 2000 places (automatically for exact name matches, by hand when names had been changed or mergers/splits had occurred). Similarly, 1890 counties and 2000 counties were matched. Second, the 2000 census place-county file was used to allocate county level demographics to each place through an allocation factor computed by the census. This factor equals one for places fully inside one county (as most places are), but less than one for places crossing county boundaries. This procedure improves the allocation of county demographics to places compared with a procedure of picking the main county of a place, but the use of the year 2000 allocation factor is an approximation guided by data availability.

## Measures

*Diversity Variables.* Three variables were created to measure the social diversity of a community. *Ethnic Diversity* was measured by the Blau index ( $1 - \sum p^2$ , where  $p$  is the category proportion) of the racial distribution among five groups (white, African American, Chinese, Japanese, and American Indian). *National Origin Diversity* was calculated based on the census data on the national origin of the foreign-born individuals. It is the Blau index over the 40 (plus a residual) categories in the census. The categories are fine-grained for European origins and provide information at the country level, but those for non-European origins were more broadly-defined (Asia except China and Japan; Africa; Cuba and West Indies; Atlantic Islands; Pacific Islands; Central America). Some categories are not independent countries (Bohemia, Hawaii, England, Scotland and Wales). However, we used the original categories unmodified because they reflected salient divisions at the time. *Religious Diversity* is a Blau index over the membership of different categories of churches in the county. There are 58 categories of churches in the census data, reflecting the highly diverse religious life at the time and the high priority given to mapping churches accurately in the census. Again, the original categories are used without modification.

*Wealth Inequality* was operationalized by the inequality of farm size based on the census

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<sup>3</sup> A census-designated place is a concentration of population identified by the US Census Bureau for statistical purposes. It refers to a populated area that is not under a separate municipal government.

categorization of farms (less than 10 acres, 10 to 19 acres, 20 to 49 acres, 50 to 99 acres, 100 to 499 acres, 500 to 99 acres, and 1,000 acres and over). It is calculated as a Gini index with adjustment for categorical source data (Gastwirth 1972). The formula is:

$$G = (2\mu)^{-1} \sum_{i=1}^c \sum_{j \neq i} P_i P_j |\mu_i - \mu_j|.$$

Here,  $\mu_i$  is the category center-point,  $\mu$  is the grand mean, and  $p_i$  is the proportion of farms in each category. The Gini index is a measure of inequality of distribution, as it shows the average gain an individual would get if given an opportunity to changes places with someone else. The greater the inequality, the greater the expected gain from changing places, assuming (as the measure does) that only offers of upward moves would be taken. Farms of a given size differ in value depending on their specific crops and husbandry, but within a county the growth conditions should be sufficiently similar that relative farm sizes are sufficiently informative of the economic inequality of farmers. The Blau and Gini indexes take a maximum value of unity and are interpreted such that higher values mean greater diversity/inequality.

*Control Variables.* The following control variables were entered. Five bank-level variables were added to control for the effects of bank characteristics on bank run. *National Bank*, *State Bank*, and *Savings Bank* are indicator variables coded according to the type of banks. National banks were regulated by the Office of Comptroller of the Currency (OCC), created in 1863 when the National Banking Act of 1863 was passed, and state banks were regulated by the state banking authorities. Different types of banks were subject to different rules and regulations, and different regulators had different supervisory philosophies and policies, which in turn could significantly influence bank customers' confidence about their banks. Thus it is possible that different types of banks had systematically different probabilities of being suspended. The omitted category represents the most lightly-regulated commercial banks. The proportion of each bank type in the sample (a bank is the unit of analysis) is 24.1 percent for national banks, 10.5 percent for state banks, 5.7 percent for savings banks, and the remaining 59.7 percent for commercial banks. The proportions in the event data are shown in Table 1 and show a slightly higher portion of national banks because few of them were suspended.

Older banks may be able to instill more confidence among their customers, consequently decreasing the probability of customers starting a run. Thus we included *Bank Age*, the natural logarithm of the bank age. The size of a bank may influence the probability that the bank experiences a run directly by providing varying levels of available resources and indirectly by shaping customer perception. For example, even during a rampant banking panic, the depositors of a large bank may come to believe that their bank is insulated from failure because it is “too big to fail.” To control for the potential effect of bank size we included *Paid-In Capital*, which was measured as the natural logarithm of the paid-in capital of the banks. The capital level of a bank is of particular importance to banks during a banking crisis (Curry, O’Keefe, Coburn and Montgomery 1999), and paid-in capital represents the funds raised by the bank from equity and is closely related to the other indicators of size such as assets and equity capital.

We also included community-level control variables. *Bank density* is the number of banks in the community (measured at the place level), and it was entered along with its squared term (*Bank density squared/100*) to capture an inverse-U shaped relation that would occur if panics were affected by legitimacy and competition in the same way as failures are in organizational ecology (e.g., Carroll and Hannan 2000). *Urbanization* is the proportion of the total population living in urban areas in a given county. *Proportion Farm Families* is the proportion of families in a county that were farmers. A variety of other county-level controls were also considered, such as population density, but they were found to have no significant effects on bank runs and were therefore omitted from the model. We also added a monthly stock value factor to control for the general economic climate during the period based on the following stocks and bonds: Atchinson, Topeka and Santa Fe Railroads; Southern Pacific Company; Western Union Telegraph; Government 4s coupon 1907 expiry; and Government 6s currency 1898 expiry. These securities were chosen because they were the largest in the time period by market capitalization. The *Stock Value Factor* was the first factor that emerged from a principal factors analysis. It explained 0.764 of the total variance, and all variables loaded positively. The positive loading of bonds on the factor is not anomalous, as a financial crisis produces positive correlations of securities (Forbes and Rigobon 2002).

## Methodology

Based on historical accounts and the pattern of suspensions in the data, the bank panic is taken to have occurred between April 1 and August 31 of 1893, a period that captures 391 of the 407 bank suspensions that occurred in the sample states that year. Each bank is at risk of experiencing a run from the first day of that period until it actually experiences a run. The analysis uses an exponential hazard rate model with distance-weighted influence from all prior bank runs (*Distance-weight Runs*). This approach is the same as a multiplicative heterogeneous diffusion model (Strang and Tuma 1993) in which the probability of a bank run is determined by the product of the contagion effect from earlier runs and the susceptibility of each bank.

To avoid bias from our state sample, the influence of bank runs outside the 22 sample states is also included in the model (Greve, Tuma and Strang 2001). It is reasonable to assume that runs are less likely to influence distant communities than communities nearby; indeed a kernel estimate of city-pair fastest-jump infection routes showed a strong reduction in the contagiousness of a run as the distance between city pairs increased. Rather than assuming one specific functional form of this effect, we tried multiple forms and parameter values and chose the one with the best model fit, as shown through the Bayesian Information Criteria (BIC) value (Raftery 1995). We considered power models with different parameter values (e.g.,  $D^{-\gamma}$  where  $D$  is distance and  $\gamma$  is the influence decay parameter), exponential models with different parameter values ( $\exp(-\gamma D)$ ), and an inverse-log model ( $1/\ln(D)$ ). The effects of the hypothesis-testing variables were consistent across these models. The models presented in the paper are based on the best fitting inverse-log specification. Given the exponential model and the distance-weighted influence, the final model is specified as:

$$r(X,t) = \exp(\beta X) \exp(\gamma \sum_p 1/\ln(D)).$$

Here,  $p$  is prior panics,  $D$  is distance, and  $\gamma$  is the influence decay parameter. The influence variable has the associated coefficient  $\gamma$ . To account for stronger influence of the runs that occurred within the same state (as compared with other states) we added a state-specific influence term of the same functional form but with only same-state bank runs (*Distance-weighted Runs in the Same State*). Finally,  $X$  is the conventional regression function of bank and community variables with associated

coefficients  $\beta$ .

In order to keep the contagion term updated at all times, we employed event-based spell splitting (Greve 1995): New spells are created for all banks in the data whenever there is a bank run, and the contagion term is recalculated to reflect all runs that have occurred to date. The spells are also split at the start of each month to update the stock market variable. Because this leads to repetition of the same bank across many spells, the standard errors are adjusted for clustering on the bank. We could alternatively adjust the standard errors for clustering on the county, as our key independent variables are at the county level, and we found that county clustering preserved our findings.

## Results

After deletions of missing data, the analysis data set has 6,639 banks that are at risk of experiencing a bank run for a maximum of 153 days. Of the 6,639 banks, 391 experienced a bank run, giving a 0.059 probability of experiencing a bank run during the study period. Accordingly, the average time at risk is close to the maximum: 149.6. The first event occurs 6 days into the study period. After splitting spells to update covariates, there are 710,751 observations in the data. Table 1 shows the descriptive statistics and zero-order correlations of all the variables used in the analysis.

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Insert Table 1 about here  
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Table 2 shows the results of the exponential hazard models on bank runs. We estimated models with two types of fixed effects to account for heterogeneity that may exist at different levels: Model 1 and 2 are specified with state level fixed effects, and Model 3 and 4 shows results based on county level fixed effects. In Models 1 and 2, the variation used to estimate the coefficients comes from within-state differences in the community characteristics variables as well as the change in the diffusion influence over time. This specification allows the identification of the main effects of the community level variables while the county fixed effects will absorb those effects. However, state level fixed effects models may yield biased estimates if there are unobserved differences among communities. Hence, in models 3 and 4, the state level fixed effects are replaced with county level fixed effects, which provide stronger controls for unobserved heterogeneity than state level fixed

effects because the variation used to estimate the coefficients relies on the temporal change of community-level independent variables. In this specification, the main effect estimates shown in Models 3 and 4 are omitted along with the control variables for urbanization and proportion farm families; they are absorbed by the fixed effects because they are measured at the county level. Hence, we test the hypotheses with the interactions of the community variables and the distance-weighted runs in the same state. These interactions directly test how community characteristics variables influence the contagion from nearby communities, and thus give a strict test of the hypotheses. Since the interactions are a more direct test of our theories and the county level fixed effects offer stronger controls for unobserved heterogeneity among communities, we use Model 4 to test the hypotheses.

Model 1 and Model 3 are diffusion models that do not take into account community characteristics, and the community characteristics variables and their interactions with the same-state bank runs are added to Model 2 and 4 respectively. For all models, likelihood ratio tests are performed relative to a non-diffusion model with all the control variables, and show strong explanatory power from the two contagion variables (*Distance-weighted Runs* and *Distance-weighted Runs in the Same State*), as well as strong additional explanatory power from the community variables and their interactions with *Distance-weighted Runs in the Same State* that test the hypotheses. In addition, for Model 2 and Model 4 likelihood ratio tests against Model 1 and Model 3 are performed, and show strong additional explanatory power from the interaction variables that test the hypotheses.

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Insert Table 2 about here  
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Models 1 and 2 show that the coefficient estimate of *Distance-weighted Runs* is positive and significant, and *Distance-weighted Runs in the Same State* is also positive and significant; these results provide strong evidence of the contagion of bank runs. For ease of interpretation, the coefficient estimate of Model 1 can be used to calculate the average effect strength of the diffusion variables before taking into account community differences. A coefficient estimate of 0.572 of *Distance-weighted Runs* corresponds to a 71 percent increase in the risk of a bank run for a two standard deviation change in *Distance-weighted Runs* ( $=\exp[0.572 \times 2 \times 0.47] - 1$ ). Because all within-state bank runs are also in the all-bank-runs influence vector, the coefficient estimate of *Distance-*

*weighted Runs in the Same State* shows how much *more* influential than same-state runs are. Thus, for the coefficient estimate of 1.609, a two standard deviation increase in this variable further increases the risk of a bank run by 67 percent, for a total of 186 percent increase when taking both effects into account ( $1.71 \times 1.67 - 1$ ; a calculation that represents a community that experienced exactly a two standard deviation increase in both variables).

Model 2 with state level fixed effects and the main effects provide support for Hypothesis 1 and 3, as both ethnic diversity and religious diversity of a community significantly decrease the likelihood that banks in the community experience a run. However, Model 2 also provides a surprising finding, as the national origin diversity has a weak positive link with the bank run risk, inconsistent with the negative effect posited in Hypothesis 2. For inequality, the positive and significant estimate suggests that the effect of internal community distrust among economic classes is stronger than that of community distrust of the bank. However, these results should be viewed with caution because state level fixed effects are not sufficient to control for unobserved community characteristics along such dimensions as spatial concentration of residences within the community, density of voluntary organizations, or industry composition. The magnitudes of the coefficients suggest strong effects, but we defer calculation until the final Model 4 because the coefficient estimates may be biased by the weaker state-level controls.

To test the hypotheses with stronger controls, we proceed to Models 3 and 4 with county level fixed effects. Model 3 shows similar effects of nationwide and statewide contagion as Model 1, but the effect of within-state contagion is stronger in Model 3. A two standard deviation increase in *Distance-weighted Runs* results in an increase in the risk of a bank run of 67 percent, comparable to Model 1. A two standard deviation increase in distance-weighted runs within the state increases the risk of a bank run by 196 percent (triple the risk), for a total increase of 392 percent if we take both effects into account.

Model 4 provides support for Hypotheses 2 through 4, as it shows negative and statistically significant coefficient estimates for national origin diversity, religious diversity, and wealth inequality. It does not, however, support Hypothesis 1, as the coefficient estimate for ethnic diversity is positive and marginally significant. The coefficient estimates show that a two standard deviation increase in

the interaction of the within-state contagion and the national origin diversity of a community decreases the risk of a bank run by 94 percent. A two standard deviation increase in the interaction of within-state contagion and the religious diversity decreases the risk of a bank run to practically zero. A two standard deviation increase in the wealth inequality decreases the risk of a bank run by 45 percent. The result for religious diversity is not consistent with the one obtained from state level fixed effects model shown in Model 2. Because this result is from a model with stronger controls than Model 2, we conclude that Hypothesis 4 is supported. Also, because the significant finding for ethnic diversity in Model 2 is reversed in Model 4 with stronger controls, but fails to reach full significance, we conclude that the support for Hypothesis 1 obtained from Model 2 is spurious.

The effect of national origin diversity is very strong, and is consistent with the previous study on the 1857 bank panic (Kelly and O Grada 2000). However, the past work was done on an event that had occurred more than a generation before the 1893 panic and focused on personal networks; hence it did not capture community-wide diversity as in our analysis. Our analysis has thus rolled the evidence for community divisions by national origin forward by more than a generation, and it has shown that the effect can be documented for community-wide demographic distributions, not just within-network contagion.

The effect of religious diversity is negative as expected, indicating better diffusion of information within each denomination than across denominations. An interesting feature of the effect of religious diversity is that it has two potential mechanisms. One is that churches shape identity and interaction patterns in communities (Borgonovi 2008; Lichterman 2008), which can directly affect a community's view of organizational forms (King and Haveman 2008). In this view, ongoing communication through interpersonal networks is more cohesive and persistent among coreligionists than among individuals who do not share the same religious beliefs, and it significantly influences the diffusion process. The other mechanism is that the church is an assembly point that convenes individuals to exchange information and discuss its interpretation, as in the chat that would have taken place during post-mass assemblies such as the "church coffee." Both mechanisms could be at work simultaneously. However, they differ subtly in their theoretical implications and may leave different traces empirically as well. Theoretically, the network explanation is rooted in ideas of coreligionists

as an in-group that develops a common identity from the religion and is more wary of interactions outside their group than within it. The assembly point explanation sees the church as a community organization that brings people together and that has side effects unrelated to their shared identities or even the purpose of the church assembly. Empirically a trace of these explanations should be found in the distribution of bank runs by the days of a week: since most church members in the data belong to Christian churches, the assembly would have taken place on Sundays, which would lead to an increased rate of bank runs on Mondays. The network explanation makes no such prediction, though one could argue that there would be more runs on Mondays even under the network explanation because individuals would have not been able to act on their information on Sundays when banks were closed.

In fact, the data do show only one bank suspension on a Sunday. The full weekday distribution of suspensions is found in Table 3. There is some concentration of suspensions on Mondays, but the increase does not seem large enough to conclude that the church assembly is the main mechanism driving bank runs. Thus the interpersonal communication and networks explanation remains plausible in light of the weekday distribution of runs shown in Table 3.

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Insert Table 3 about here  
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*Supplementary Analysis: Separate Estimation for Failed and Reopened Banks.* Although we do not hypothesize a systematic difference between bank runs against financially weak and strong banks in our theory, testing for such differences is relevant to the claims made by the economic historians who posited that uninformed withdrawals were important for this bank panic (Dupont 2007; Ramirez 2009). We can address this question by distinguishing between banks that failed after experiencing a run and banks that survived a run. In principle, a solvent bank should be able to successfully reopen after a suspension caused by a bank run, while an insolvent one will fail. In practice, the relation is more complicated because a bank run can topple even a healthy bank by forcing the bank to suffer from fire-sale costs of assets and loss of deposits of non-returning customers, but when viewed as a stochastic process with some error term, the relation should hold. This suggests an analytical strategy of treating suspension-to-failure and suspension-to-reopen as

competing risks and examining the coefficient estimates for differences. Variables that predict suspension-to-failure better will either indicate informed withdrawal or some spurious relation such as a selectivity effect. Hence, we estimated models that differentiate suspension-to-failure and suspension-to-reopen.

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Insert Table 4 about here  
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The models are shown in Table 4. As in Table 2, we show models with both state and county level fixed effects, but we focus our interpretation on the final models 7 and 8 with the stronger county fixed effects, and display models 5 and 6 only for comparison. Model 7 and Model 8 mirror the results on the hypothesis tests of Model 4, as the same variables have the same directional effects and are significant at comparable levels. The foreign-born diversity has lower significance in Model 8, but the magnitude is nearly unchanged, and very similar to Model 7. It seems likely that the difference in significance levels can be attributed to the fewer events in Model 8. Most coefficients have similar magnitudes for bank runs to reopen and bank runs to failure, suggesting that the bank runs did not differentiate among banks based on the variables in our specification. The coefficient estimates on religious diversity differ for runs to reopen and runs to failure, and in a direction that suggests that religious diversity had a greater effect on the risk of runs on reopened banks. This might suggest that religiously homogeneous communities were more risky for financially healthy banks, but the difference is small compared to the standard deviation of each estimate.

### **Discussion and Conclusion**

Recent research on contagious distrust of organizations following adverse events (e.g., Jonsson et al. 2009; Yu et al. 2008) has raised two salient questions. First, how does distrust become contagious? Second, which organizations are more likely to suffer its consequences? We have focused on the second of these questions because we find the selective targeting of certain organizations to be a greater puzzle than the overall spread of distrust. Because contagious distrust is a community reaction against organizations that may not have done anything wrong, we have answered it by turning our theoretical lens to the community level characteristics. Although we focus on the second

question, our theory and evidence speak to both of these questions. First, our assumption that interpersonal diffusion of information had a role in the 1893 bank panic is validated at the macro level by the strong effects of geographically weighted bank runs, especially those within the same state. Second, applying the same assumption within communities, but adding theory on when diffusion is more efficient and likely to cause joint action, we also find that banks in less diverse communities were more likely to experience bank runs.

These findings stand in stark contrast to the premise of earlier work seeking to explain bank runs by differences in the financial conditions of each bank—i.e., the financial health of a bank has little influence on its probability of experiencing a bank run. This might seem surprising because it seems reasonable to expect that the financial health of a bank has a strong influence on the probability that it will experience a run. However, the internal characteristics of individual banks have been shown to be imperfect predictors of a bank run at best (Calomiris and Gorton 1991; Dupont 2007). During a system-wide bank panic, a substantial number of financially-strong banks experience a bank run, while the majority of financially-weak banks do not. This apparent paradox can be explained by turning the attention to the characteristics of the community to which a bank belongs, and especially how the group structure affects information diffusion. This is because individuals make decisions based on the information and interpretations available to them. When events are threatening and fast-moving, as in the diffusion of adverse information about a key organizational form such as banks, information from peers may be more readily available and more salient than the internal characteristics of a bank (Kim and Miner 2007).

Thus, to explain why runs occurred selectively for some banks and not for others, we show a link between the community structure and organizational vulnerability. Here we turn to theory on the organization-community relationship (Freeman and Audia 2006; Marquis and Lounsbury 2007). We argue that cohesive communities increase the risk of a bank run because they can more easily come to a common understanding of the adverse information, leading to a community-wide loss of trust. Consistent with this theory, we found that bank runs were more likely in communities with national origin, religious, and economic homogeneity. The effects were statistically significant and of substantive magnitude.

These results signify our theory that community diversity limits the diffusion of bank runs in a bank panic because the fragmentation resulting from community diversity decreases the communication within the community, decelerates the spread of rumors about bank runs, and lessens the probability that negative opinions about the banks in the community is formed at the community level. Thus, our findings provide support for the assertion that community diversity negatively influences the diffusion of information. We argued that the primary mechanism driving this relationship is the distrust among the members of different ethnic, religious, and/or economic groups—i.e., distrust results in lower communication, which in turn limits diffusion of information.

The findings are noteworthy because arguments on individual attachment to organizations would suggest the opposite prediction. Organizations are collective action projects that sustain themselves by providing sufficient rewards to stakeholders to justify their participation (March and Simon 1958), but may unravel if the benefits are below a participation constraint. In collective action, heterogeneity in costs and benefits renders a joint effort more difficult (Stinchcombe 1965). High social diversity and high economic inequality will reduce knowledge of the costs and benefits obtained by others and increase the likelihood that the benefit distribution is not perceived to be fair (Heckathorn 1993; Molm, Peterson and Takahashi 2003). It is well-documented that members of a heterogeneity community do not participate in community activities because the benefits of such activities are distributed unfairly among different groups (e.g., Alesina and La Ferrara 2000; Harris et al. 2001). Mutual recognition of potential differences in interests might create the suspicion that members of other groups will start a run. For example, affluent business owners and poor farmers would use a different range of bank services and have different costs of establishing a business relation with a new bank, creating perceived differences in the cost of bank failure that in turn could make the bank vulnerable to a run started by the subgroup that valued the bank less.

Thus, a second-order effect of distrust among diverse social or economic groups is the uncertainty about how the other groups will act when an important community organization is under scrutiny. If the uncertainty is high, community members may try to act first before others do. This countervailing effect of distrust may make highly diverse communities vulnerable to bank runs. Our findings contradict this alternative perspective, but further study might reveal interactions between

these countervailing forces.

Our evidence has some limitations owing to the lack of information on the customer base of the different banks. For example, one might wonder whether banks differentially drew their customers from different groups in the community. To some extent we can identify the most likely customer groups of the suspended banks by inspecting their names. German National Bank and Stockgrower's National bank, for example, were chartered with an intention to serve German immigrants (national origin) or stock growers (occupational group) respectively. However, such specific names were rare in the data, and the dispersed settlements in the Western U.S. in this period meant that many communities had one or only a few banks, often named after the geographical location. Different groups having different banks would work against our hypotheses because agreement among members of one group would then be enough to trigger a run on its bank even if the community diversity were high, whereas we hypothesize that runs are more likely when the community diversity is low. Another possible confounding factor is that distance may have been a proxy for homophily in our data; for example if communities with the same occupational distribution are close to each other, they will have stronger influence on each other because individuals with same occupation see each other as more relevant. Such an effect cannot be ruled out with our data, but it concerns the interpretation of a control in the model (geographical distance) rather than a hypothesized effect.

The implications for understanding the contagion of loss of trust through stigmatization processes are clear (Jonsson et al. 2009; Pontikes et al. 2010; Zuckerman 1999). Because each event spreads the distrust further, it is important to understand which organizations fall victim. The ability to link this risk to community characteristics, as we have done, makes the outcome much more predictable. Note that this is a different approach from searching for organizational characteristics that make an individual organization especially prominent in a stigmatizing event, such as its status. Distrust can be spread through two routes; one involving a few highly contagious organizations as sources, and the other involving many highly susceptible organizations falling like dominos. In our data we found no strong evidence of organizational characteristics driving their influence on others, but we did find strong vulnerability effects. Thus the 1893 bank panic appears to have been a domino effect rather than a result of a few highly influential organizations. This is in contrast to current policy

discussions that focus on the “too large to fail” idea of banks that are so influential that they would shake the entire financial system, thus neglecting the possibility of an equally-damaging event driven by contagion among smaller banks.

The implications for organizations are also clear. The bond of trust between a customer and an organization can be broken by events outside the control of the management of the organization, and such events may be especially consequential for organizations that rely greatly on symbolic sources of legitimacy, like banks. Organizations can, however, assess their vulnerability to such processes. This vulnerability has two dimensions: (1) the likelihood that a related organization will be a “trigger” through behavior that reduces trust in the form, and (2) the characteristics of its community that may make its loss of trust more likely. Recognizing key community characteristics that increase the vulnerability of the organizations in the community to an outbreak of delegitimizing events provides insight on how they can counteract such vulnerability. Organizations operating in a homogenous community can establish a strong relationship with influential groups within the community and actively manage their image to prevent the formation of negative opinions—after all, homogeneity can give rise positive opinions as well as negative opinions.

Bank panics are representative of a broad class of events involving loss of trust in organizations. The underlying process of information diffusion has important consequences at the level of the organizational form and the level of individual organization. When it involves a cornerstone organization in the modern economy such as banks, it also has broad consequences for economic activity. Despite this importance, there are still major gaps in our knowledge of the drivers of such events, especially the apparent selectivity to which organizations are most vulnerable. We have focused here on community characteristics because it seems reasonable to conceptualize trust in an organization at the community level, but complementary approaches for studying this phenomenon are clearly possible. Further investigation of contagious loss of trust as a diffusion process with heterogeneous vulnerability may yield important new insights.

## REFERENCES

- Ahmadjian, C.L., P. Robinson. 2001. Safety in numbers: Downsizing and the deinstitutionalization of permanent employment in Japan. *Admin. Sci. Quart.* **46**(December) 622-654.
- Alesina, A., R. Baqir, W. Easterly. 1999. Public goods and ethnic divisions. *The Quarterly Journal of Economics* **114**(4) 1243-1284.
- Alesina, A., A. Devleeschauwer, W. Easterly, S. Kurlat, R. Wacziarg. 2003. Fractionalization. *Journal of Economic Growth* **8**(2) 155-194.
- Alesina, A., E. La Ferrara. 2000. Participation in heterogeneous communities. *Quarterly Journal of Economics* **115**(3) 847-904.
- Anari, A., J. Kolari, J. Mason. 2005. Bank asset liquidation and the propagation of the US Great Depression. *J Money Credit Bank* **37**(4) 753-773.
- Audia, P.G., J.H. Freeman, P. Reynolds. 2006. Organizational foundings in community context: Instrument manufacturers and their interrelationship with other organizations. *Administrative Science Quarterly* **51**(September) 381-419.
- Bikhchandani, S., D. Hirshleifer, I. Welch. 1992. A theory of fads, fashion, custom, and cultural change as informational cascades. *Journal of Political Economy* **100**(5) 992-1026.
- Borgonovi, F. 2008. Divided we stand, United we fall: Religious pluralism, giving, and volunteering. *American Sociological Review* **73**(1) 105-128.
- Calomiris, C.W., G. Gorton. 1991. The origins of banking panics: Models, facts, and bank regulation. R.G. Hubbard, ed. *Financial Markets and Financial Crises*. University of Chicago Press, 109-174.
- Calomiris, C.W., J.R. Mason. 1997. Contagion and Bank Failures During the Great Depression: The June 1932 Chicago Banking Panic. *The American Economic Review* **87**(5) 863-883.
- Carlson, M. 2005. Causes of Bank Suspensions in the Panic of 1893. *Explorations in Economic History* **42**(1) 56-80.
- Carroll, G.R., M.T. Hannan. 2000. *The demography of corporations and industries*. Princeton University Press, Princeton, N.J.
- Costa, D.L., M.E. Kahn. 2003a. Cowards and Heroes: Group Loyalty in the American Civil War. *The Quarterly Journal of Economics* **118**(2) 519-548.
- Costa, D.L., M.E. Kahn. 2003b. Understanding the American decline in social capital, 1952-1998. *Kyklos* **56**(1) 17-46.
- Curry, T.J., J.P. O'Keefe, J. Coburn, L. Montgomery. 1999. Financially distressed banks: How effective are enforcement actions in the supervision process? *FDIC Banking Review* **12**(2) 1-18.
- DeYoung, R., M. Kwalik, J. Reidhill. 2011. A theory of bank resolution: Technological change and political economics.
- Diamond, D.W., P.H. Dybvig. 1983. Bank runs, deposit Insurance, and liquidity. *Journal of Political Economy* **91**(3) 401-419.

- Duncan, O.D., S. Lieberman. 1959. Ethnic segregation and assimilation. *American Journal of Sociology* **64**(4) 364-374.
- Dupont, B. 2007. Bank Runs, Information and Contagion in the Panic of 1893. *Explorations in Economic History* **44**(3) 411-431.
- Elsbach, K.D. 1994. Managing organizational legitimacy in the California cattle industry: The construction and effectiveness of verbal accounts. *Admin. Sci. Quart.* **39**(March) 57-88.
- Elsbach, K.D., R.M. Kramer. 1996. Members' responses to organizational identity threats: Countering the Business Week Rankings. *Admin. Sci. Quart.* **41**(September) 442-476.
- Erickson, B.H. 1988. The relational basis of attitudes. B. Wellman, S.D. Berkowitz, eds. *Social structures: A network approach*. Cambridge University Press, New York, 99-121.
- Forbes, K.J., R. Rigobon. 2002. No Contagion, Only Interdependence: Measuring Stock Market Comovements. *Journal of Finance* **57**(5) 2223-2261.
- Freeman, J.H., P.G. Audia. 2006. Community ecology and the sociology of organizations. *Annual Review of Sociology* **32** 145-169.
- Friedkin, N.E., E.C. Johnson. 1990. Social influence and opinions. *Mathematical Sociology* **15**(3-4) 193-205.
- Gaba, V., A.D. Meyer. 2008. Crossing the organizational species barrier: How venture capital practices infiltrated the information technology sector. *Academy of Management Journal* **51**(5) 976-998.
- Gastwirth, J.L. 1972. The estimation of the Lorenz curve and Gini index. *Review of Economics and Statistics* **54**(August) 306-316.
- Goldin, C., L.F. Katz. 1999. Human capital and social capital: The rise of secondary schooling in America, 1910-1940. *Journal of Interdisciplinary History* **29**(4) 683-723.
- Greve, H.R. 1995. Jumping ship: The diffusion of strategy abandonment. *Administrative Science Quarterly* **40**(September) 444-473.
- Greve, H.R. 1998. Managerial cognition and the mimetic adoption of market positions: What you see is what you do. *Strategic Management Journal* **19**(October) 967-988.
- Greve, H.R., J.-E. Pozner, H. Rao. 2006. Vox populi: Resource partitioning, organizational proliferation, and the cultural impact of the insurgent micro-radio movement. *American Journal of Sociology* **112**(3) 802-837.
- Greve, H.R., H. Rao. 2012. Echoes of the past: Organizational foundings as sources of an institutional legacy of mutualism. *American Journal of Sociology* **118**(3): 635-675.
- Greve, H.R., N.B. Tuma, D. Strang. 2001. Estimation of diffusion processes from incomplete data: A simulation study. *Sociological Methods and Research* **29**(4) 435-467.
- Guiso, L., P. Sapienze, L. Zingales. forthcoming. The determinants of attitudes towards strategic default on mortgages. *Journal of Finance*.
- Habyarimana, J., M. Humphreys, D.N. Posner, J.M. Weinstein. 2008. Why does ethnic diversity undermine public goods provision? *American Political Science Review* **101**(4) 709-725.

- Harris, A.R., W.N. Evans, R.M. Schwab. 2001. Education spending in an aging America. *Journal of Public Economics* **81**(3) 449-472.
- Heckathorn, D.D. 1993. Collective action and group heterogeneity: Voluntary provision versus selective incentives. *American Sociological Review* **58**(3) 329-350.
- Hedstrom, P. 1994. Contagious collectivities: On the spatial diffusion of Swedish trade unions, 1890-1940. *American Journal of Sociology* **99**(5) 1157-1179.
- Hoffmann, C. 1956. The Depression of the Nineties. *The Journal of Economic History* **16**(2) 137-164.
- Huckfeldt, R., P.A. Beck, R.J. Dalton, J. Levine. 1995. Political environments, cohesive social groups, and the communication of public opinion. *American Journal of Political Science* **39**(4) 1025.
- Huckfeldt, R., P.E. Johnson, J. Sprague. 2004. *Political disagreement: The survival of diverse opinions within communication networks*. Cambridge University Press, Cambridge.
- Huckfeldt, R., E. Plutzer. 1993. Alternative contexts of political behavior: Churches, neighborhoods, and individuals. *Journal of Politics* **55**(2) 365.
- Iannaccone, L.R. 1994. Why strict churches are strong? *American Journal of Sociology* **99**(5) 1180-1211.
- Ingram, P., L.Q. Yue, H. Rao. 2010. Trouble in store: Probes, protests, and store openings by Wal-Mart, 1998-2007. *American Journal of Sociology* **116**(1) 53-92.
- Iyer, R., M. Puri. 2012. Understanding Bank Runs: The Importance of Depositor-Bank Relationships and Networks. *American Economic Review* **102**(4) 1414-1445.
- Jonsson, S., H.R. Greve, T. Fujiwara-Greve. 2009. Undeserved loss: The spread of legitimacy loss to innocent organizations in response to reported deviance. *Admin. Sci. Quart.* **56**(June) 195-228.
- Kelly, M., C. O Grada. 2000. Market Contagion: Evidence from the Panics of 1854 and 1857. *American Economic Review* **90**(5) 1110-1124.
- Kim, J.-Y.J., A.S. Miner. 2007. Vicarious learning from the failures and near-failures of others: Evidence from the US commercial banking industry. *Acad. Management J.* **50**(3) 687-714.
- King, M.D., H.A. Haveman. 2008. Antislavery in America: The press, the pulpit, and the rise of antislavery societies. *Administrative Science Quarterly* **53**(3) 492-528.
- Klayman, J., Y.-W. Ha. 1987. Confirmation, disconfirmation, and information in hypothesis testing. *PsychologR* **94**(2) 211-228.
- La Ferrara, E. 2002. Inequality and group participation: theory and evidence from rural Tanzania. *Journal of Public Economics* **85**(2) 235-273.
- Lichterman, P. 2008. Religion and the construction of civic identity. *American Sociological Review* **73**(1) 83-104.
- Lindert, P.H. 1996. What limits social spending? *Explorations in Economic History* **33**(1) 1-34.
- Lord, C.G., L. Ross, M.R. Lepper. 1979. Biased assimilation and attitude polarization: The effects of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology* **37**(11) 2098-2109.

- March, J.G., H. Simon. 1958. *Organizations*. Wiley, New York.
- Marquis, C., Z. Huang. 2009. The contingent nature of public policy and the growth of U.S. commercial banking. *Academy of Management Journal* **52**(6) 1222-1246.
- Marquis, C., M. Lounsbury. 2007. Vive la resistance: Competing logics and the consolidation of U.S. community banking. *Academy of Management Journal* **50**(4) 799-820.
- McPherson, M., L. Smith-Lovin, J.M. Cook. 2001. Birds of a Feather: Homophily in Social Networks. *Annual Review of Sociology* **27**(ArticleType: research-article / Full publication date: 2001 / Copyright © 2001 Annual Reviews) 415-444.
- Meyer, J.W., B. Rowan. 1977. Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology* **83** 340-363.
- Molm, L.D., G. Peterson, N. Takahashi. 2003. In the eye of the beholder: Procedural justice in social exchange. *American Sociological Review* **68**(1) 128-152.
- Nisbett, R.E., E. Borgida, R. Crandall, H. Reed. 1976. Popular induction: Information is not always informative. J.S. Carroll, J.W. Payne, eds. *Cognition and Social Behavior*. Erlbaum, Hillsdale, NJ, 227-236.
- Okamoto, D.G. 2003. Toward a Theory of Panethnicity: Explaining Asian American Collective Action. *American Sociological Review* **68**(6) 811-842.
- Oliver, C. 1992. The antecedents of deinstitutionalization. *Organization Studies* **13** 568-588.
- Paetzold, R.L., R.L. Dipboye, K.D. Elsbach. 2008. A new look at stigmatization in and of organizations. *Acad. Management Rev.* **33**(1) 186-193.
- Phelps, R.P. 1998. The demand for standardized student testing. *Educational Measurement: Issues and Practice* **17**(3) 5-23.
- Podolny, J.M., D.J. Phillips. 1996. The dynamics of organizational status. *Industrial & Corporate Change* **5**(2) 453-471.
- Pontikes, E., G. Negro, H. Rao. 2010. Stained Red: A study of stigma by association to blacklisted artists during the "red scare" in Hollywood, 1945 to 1960. *American Sociological Review* **75**(3) 456-478.
- Pozner, J.E. 2008. Stigma and Settling Up: An Integrated Approach to the Consequences of Organizational Misconduct for Organizational Elites. *Journal of Business Ethics* **80**(1) 141-150.
- Putnam, R.D. 2007. E pluribus unum: Diversity and community in the twenty-first century the 2006 Johan Skytte Prize Lecture. *Scandinavian Political Studies* **30**(2) 137-174.
- Raftery, A.E. 1995. Bayesian model selection in social research. P.V. Marsden, ed. *Sociological Methodology*. Blackwell, Cambridge, MA, 111-163.
- Ramirez, C.D. 2009. Bank Fragility, 'Money under the Mattress', and Long-Run Growth: US Evidence from the 'Perfect' Panic of 1893. *Journal of Banking and Finance* **33**(12) 2185-2198.
- Reinhart, C.M., K.S. Rogoff. 2009. *This Time is Different: Eight Centuries of Financial Folly*. Princeton University Press, Princeton.

- Repenning, N.P., J.D. Sterman. 2002. Capability traps and self-confirming attribution errors in the dynamics of process improvement. *Admin. Sci. Quart.* **47**(2) 265-295.
- Rhee, M., P.R. Haunschild. 2006. The liability of a good reputation: A study of product recalls in the U.S. automobile industry. *Organ. Sci.* **17**(1) 101-117.
- Ruffle, B.J., R. Sosis. 2006. Cooperation and the in-group-out-group bias: A field test on Israeli kibbutz members and city residents. *Journal of Economic Behavior & Organization* **60**(2) 147-163.
- Schneiberg, M., M. King, T. Smith. 2008. Social movements and organizational form: Cooperative alternatives to corporations in the American insurance, dairy, and grain industries. *American Sociological Review* **73**(4) 635-667.
- Smith, B.D. 1991. Bank panics, suspensions, and geography: Some notes on the "contagion of fear" in banking. *Economic Inquiry* **29**(2) 230.
- Sorenson, O., P.G. Audia. 2000. The social structure of entrepreneurial activity: Geographic concentration of footwear production in the U.S., 1940-1989. *American Journal of Sociology* **106**(2) 424-462.
- Stinchcombe, A.L. 1965. Social structure and organizations. J.G. March, ed. *Handbook of organizations*. Rand McNally, Chicago, 142-193.
- Stolle, D., S. Soroka, R. Johnston. 2008. When does diversity erode trust? Neighborhood diversity, interpersonal trust and the mediating effect of social interactions. *Political Studies* **56**(1) 57-75.
- Strang, D., N.B. Tuma. 1993. Spatial and temporal heterogeneity in diffusion. *American Journal of Sociology* **99** 614-639.
- Tajfel, H., J.C. Turner. 1986. The social identity theory of intergroup behavior. W.G. Austin, S. Worchel, eds. *The Social Psychology of Intergroup Relations*, 2nd ed. Nelson-Hall, Chicago.
- Tsai, L.L. 2007. Solidarity groups, informal accountability, and local public goods provision in rural China. *American Political Science Review* **101**(2) 355-372.
- Vallone, R.P., L. Ross, M.R. Lepper. 1979. The hostile media phenomenon: Biased perception and perceptions of media bias in the coverage of the "Beirut Massacre.". *Journal of Personality and Social Psychology* **49** 577-585.
- Wicker, E. 2000. *Banking Crises of the Gilded Age*. Cambridge University Press, Cambridge, UK
- Yu, T., M. Sengul, R. Lester. 2008. Misery loves company: The spread of negative impacts resulting from an organizational crisis. *Acad. Management Rev.* **33**(2) 452-472.
- Zelizer, V.A. 1978. Human Values and the Market: The Case of Life Insurance and Death in 19th-Century America. *American Journal of Sociology* **84**(3) 591-610.
- Zuckerman, E.W. 1999. The Categorical Imperative: Security Analysts and the Legitimacy of the Corporate Product. *American Journal of Sociology* **104**(5) 1398-1439.

**Table 1: Descriptive Statistics and Correlations (N = 710,751)**

	Variable	Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	National Bank	0.25	0.43															
2	State Bank	0.09	0.29	-0.18														
3	Savings Bank	0.06	0.23	-0.14	-0.08													
4	Bank Density	5.90	15.61	0.05	-0.06	0.08												
5	Bank Density Squared/100	2.78	17.69	0.01	-0.04	0.03	0.96											
6	Bank Age	8.44	8.38	0.20	-0.13	-0.04	-0.02	-0.04										
7	Paid-in Capital	55.67	133.5	0.23	-0.06	0.01	0.37	0.30	0.11									
8	Urbanization	0.09	0.24	0.04	-0.05	0.14	0.66	0.51	-0.01	0.39								
9	Proportion Farm Families	0.49	0.21	-0.17	0.16	-0.15	-0.46	-0.33	-0.10	-0.32	-0.64							
10	Stock Value Factor	-0.68	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01						
11	Distance-weighted Runs	0.56	0.47	0.00	0.00	0.00	0.05	0.04	0.00	0.02	0.03	-0.02	-0.36					
12	Distance-weighted Runs in Same State	0.04	0.16	0.01	-0.01	0.01	0.15	0.14	0.00	0.06	0.11	-0.09	-0.07	0.36				
13	Ethnic Diversity	0.03	0.05	0.06	-0.08	0.06	0.05	0.00	0.04	0.16	0.17	-0.38	0.00	0.00	0.02			
14	National Origin Diversity	0.73	0.13	-0.02	-0.01	0.06	0.14	0.10	-0.12	0.08	0.16	-0.11	0.00	0.01	0.02	0.12		
15	Religious Diversity	0.86	0.08	0.00	0.01	0.03	0.11	0.07	0.07	0.07	0.17	-0.09	0.00	0.00	0.03	-0.08	-0.02	
16	Wealth Inequality	0.34	0.14	0.07	-0.16	0.12	0.24	0.17	0.16	0.24	0.37	-0.59	0.00	0.01	0.06	0.37	-0.10	0.15

**Table 2: Exponential Models of Bank Runs**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
<i>Control Variables</i>				
National Bank	-0.329* (0.150)	-0.310* (0.148)	-0.361** (0.129)	-0.405** (0.133)
State Bank	-0.166 (0.233)	-0.146 (0.235)	-0.199 (0.214)	-0.060 (0.213)
Savings Bank	-0.341 (0.289)	-0.346 (0.284)	-0.403† (0.227)	-0.410† (0.220)
Bank Density	-0.036*** (0.010)	-0.036*** (0.010)	-0.134*** (0.026)	-0.031 (0.035)
Bank Density squared/100	0.001* (0.000)	0.001* (0.000)	0.072** (0.023)	0.007 (0.030)
Bank Age	-0.301*** (0.052)	-0.308*** (0.050)	-0.034*** (0.008)	-0.026*** (0.008)
Paid-in Capital	0.240*** (0.041)	0.245*** (0.040)	0.032 (0.025)	0.031 (0.025)
Urbanization	0.304 (0.388)	-0.024 (0.423)		
Proportion Farm Families	-2.369*** (0.514)	-2.356*** (0.525)		
Stock Value Factor	-0.429*** (0.123)	-0.436*** (0.124)	-0.112 (0.133)	-0.282† (0.162)
Fixed effects	State	State	County	County
<i>Distance-weighted Bank Runs</i>				
Distance-weighted Runs	0.572*** (0.127)	0.566*** (0.127)	0.543*** (0.149)	0.290 (0.189)
Distance-weighted Runs in the Same State	1.609*** (0.165)	1.650*** (0.169)	3.390*** (0.265)	51.883*** (6.552)
<i>Research Variables</i>				
Ethnic Diversity		-3.272* (1.499)		
National Origin Diversity		1.233† (0.688)		
Religious Diversity		-1.392* (0.621)		
Wealth Inequality		2.076* (0.892)		
<i>Interactions</i>				
Ethnic Diversity X Runs in the Same State				3.577† (2.017)
National Origin Diversity X Runs in the Same State				-11.015*** (2.427)
Religious Diversity X Runs in the Same State				-43.230*** (7.381)
Wealth Inequality X Runs in the Same State				-4.120*** (0.858)
Likelihood Ratio Test	1912.96***	1,928.10***	2569.36***	2900.36***

Degree of Freedom	2	6	2	6
Likelihood Ratio Test		15.14**		331.00***
Degree of Freedom		4		4

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Notes: † $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; Standard errors are clustered by the bank and shown in the parenthesis; 710,751 spell segments; 391 events; 6,639 banks with a total of 992,794 days at risk, ranging from 6 to 153 (end of study); mean 149.6; no gaps.

**Table 3: Runs per Weekday**

<b>Weekday</b>	<b>The Number of Banks with runs</b>	<b>Percent of weekly runs (%)</b>
Monday	82	20.7
Tuesday	60	15.2
Wednesday	70	17.7
Thursday	65	16.4
Friday	71	17.9
Saturday	47	11.9
Sunday	1	0.3
Sum	396	100.0

Note: Percentages may not sum up to 100 because of rounding.

**Table 4: Exponential Models of Bank Runs: Failed and Reopened Banks**

	<b>Model 5 Failed</b>	<b>Model 6 Reopened</b>	<b>Model 7 Failed</b>	<b>Model 8 Reopened</b>
<i>Control Variables</i>				
National Bank	-1.061*** (0.209)	0.517* (0.217)	-1.067*** (0.199)	0.617** (0.223)
State Bank	-0.375 (0.337)	0.049 (0.399)	-0.217 (0.249)	0.382 (0.412)
Savings Bank	-0.786* (0.374)	-0.213 (0.424)	-0.329 (0.280)	-0.300 (0.395)
Bank Density	-0.058*** (0.014)	-0.016 (0.012)	-0.006 (0.053)	-0.061 (0.049)
Bank Density Squared/100	0.000 (0.000)	0.001 (0.000)	-0.006 (0.044)	-0.006 (0.045)
Bank Age	-0.068 (0.052)	-0.216*** (0.063)	-0.040*** (0.011)	-0.006 (0.013)
Paid-in Capital	0.060 (0.040)	0.145** (0.046)	0.034 (0.030)	0.037 (0.047)
Urbanization	-1.334† (0.730)	0.252 (0.804)		
Proportion Farm Families	-1.976** (0.675)	-2.250* (0.918)		
Stock Value Factor	-0.385* (0.157)	-1.103*** (0.268)	-0.063 (0.186)	-1.539*** (0.405)
Fixed Effects	State	State	County	County
<i>Distance-weighted Bank Runs</i>				
Distance-weighted Runs	0.345† (0.184)	0.794*** (0.235)	0.167 (0.250)	0.597* (0.295)
Distance-weighted Runs in the Same State	9.098*** (0.647)	6.613*** (0.690)	48.812*** (8.956)	59.331*** (12.521)
<i>Research Variables</i>				
Ethnic Diversity	-8.535*** (1.408)	-5.232*** (1.166)		
National Origin Diversity	-3.007*** (0.623)	-2.155** (0.721)		
Religious Diversity	-5.230*** (0.637)	-3.995*** (0.587)		
Wealth Inequality	0.077 (0.320)	0.255 (0.227)		
<i>Interactions</i>				
Ethnic Diversity X Runs in the Same State			4.053 (2.847)	4.728 (3.399)
National Origin Diversity X Runs in the Same State			-10.879*** (2.958)	-11.647† (6.182)
Religious Diversity X Runs in the Same State			-39.610*** (9.246)	-51.150** (17.624)
Wealth Inequality X Runs in the Same-			-4.656**	-4.378***

state			(1.503)	(0.933)
Likelihood Ratio Test	1465.30***	780.96***	1931.02***	936.20***
Degrees of Freedom	6	6	6	6

Note: † $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; Standard errors are clustered by bank and shown in the parenthesis; 710,751 spell segments; 267 failures and 124 reopening events; 6,639 banks with a total of 992,794 days at risk, ranging from 6 to 153 (end of study); mean 149.6; no gaps.

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