Financing Capacity and Fire Sales: Evidence from Bank Failures

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Abstract

Theory suggests the loss in financing capacity after the failure of a financial intermediary can reduce the value of financial assets. Forced sales of the intermediary's assets could consume liquidity, depressing the liquidation value of the assets of healthy intermediaries and causing contagious runs. This paper investigates these predictions using a new dataset of bank failures during the farm depression just before the Great Depression. Using regulatory impediments to lending across state borders as a means of identification, we find that the reduction in local financing capacity as a result of bank failures reduces the recovery rates on failed assets of nearby banks, depresses local land prices, renders land markets illiquid, and is associated with subsequent financial sector distress among nearby banks. All this suggests a rationale for why bank failures are contagious.

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In their seminal paper, Shleifer and Vishny (1992) argue that the sale price of an asset may depart from fundamental value if the best users of the asset are heavily indebted. This departure from fundamental value arises because users may be forced to sell the asset to buyers with money but with less capacity to use the asset well. Since then, there has been an explosion of research on the extent to which real assets are discounted when sold by users.[2] What has been less well studied empirically is the extent to which financial fire sales (see Coval and Stafford (2007) and Shleifer and Vishny (2011) for a comprehensive review) occur – the extent to which financial assets might fetch lower value because there is limited capacity to buy financial assets in the market.

To the extent that financial assets represent promises of payment that can be equally well assessed and enforced by anyone in the market, financial assets should not be prone to fire sales. But to the extent that buyers need special knowledge or capabilities to assess, or collect on, the asset, the asset may have a limited set of buyers, and fire sales may occur if the buyers have limited financing capacity. Bank assets such as loans may be especially prone to fire sales. In this paper, we study the liquidation value of the financial assets of failed U.S. banks in the run up to the Great Depression to see how the value realized varied with the financing capacity of the market.

The forced sale of real assets can occur because the owner has too little internal equity to be able to roll over maturing debt. A number of papers since Pulvino (1998) have uncovered a discount on real assets when distressed borrowers sell assets to second best users. The discount here may, however, have little to do with the capabilities of the financier or the availability of

[2] See, for example, Campbell, Giglio and Pathak (2011), Pulvino (1998), Benmelech (2009), Benmelech and Bergman (2008), and Benmelech, Garmaise, and Moskowitz (2005).

external finance, and may instead have to do with the drop in fundamental value as the first best users of an asset give up ownership.

Forced sales of financial assets can similarly occur when a lender, such as a bank, does not have the ability to roll over loans (see Acharya, Shin, and Yorulmazer (2011), Allen and Gale (2000) or Diamond and Rajan (2001)). One alternative for the bank is to sell its loans to healthier banks. If loans are liquid assets with a large market – if there is no specificity between lender and borrower -- there should be no discount from fundamental value in such sales.

Discounts from fundamental value on sold loans can, however, be large if special expertise or knowledge is required to make a loan (see Diamond and Rajan (2001)) and there is too little financing capacity in the market among those with similar expertise or knowledge to take the loans over. Even if the loan sales market is competitive, the limited cash available with knowledgeable banks for loan purchases puts an upper limit on what can be paid for sold loans. A shortage of available, knowledgeable liquidity, sometimes termed *cash in the market* pricing, would ensure that even though the fundamental value of the loans is high, the realized value in a loan sale is lower and depends on available financing capacity (see Allen and Gale (1994) for an early exposition and Allen and Gale (2005) or Brunnermeier and Sannikov (2013) for comprehensive reviews).[3]

An alternative possibility when a bank fails is that its solvent borrowers may also be called upon to repay their loans, especially if they have borrowed short term. Clearly, those that have cash and are liquid will be able to repay the full face value of their borrowing easily. In

[3] Two alternative views of loan sales have somewhat different implications on the role played by financing capacity. In Sharpe (1990) and Rajan (1992), the relationship banker is better informed about a borrower than all other financiers. In that case, when the bank fails, there is a discount on its loans, mitigated somewhat by the fact that the bank is forced to sell all loans rather than an adversely selected few (see Gibbons and Katz (1995)). Note that the financing capacity of loan buyers should have little impact on the "lemons" discount here. Similarly, it may be that all banks other than the failing "relationship" bank have lower ability to collect on transferred loans. Here again, the loans will sell for a discount, but the discount need not be dependent on the aggregate financing capacity of the remaining banks.

contrast, the capacity of illiquid borrowers to repay will depend on their ability to secure new financing from elsewhere. Even though the borrowers may have had the internal equity to continue rolling over loans from the original bank if the latter had adequate financing, once that bank has to recall loans, there may be few financiers that have the same lending skills as the original bank. If so, a number of borrowers may have to go to less capable new lenders and may be able to borrow significantly less. Indeed, loans may dry up and borrower assets may be seized and liquidated (or sold to second-best users at a discount to their value in best use). So if financing capacity is limited, a financially distressed bank may have to force its borrowers to liquidate real assets, with adverse real consequences.

All these possibilities – loan sales, loan refinancing, and asset liquidation – suggest the recovery rate for a failed bank on its assets (that is, its loans) should be affected by the aggregate financing capacity available in the local economy. Furthermore, the depressed value of financial assets can lead to a contagion of bank failures and widespread real effects (see, for example, Allen and Gale (2005), Bernanke (1983), Detriagache, Dell'Arricia and Rajan (2008), Diamond and Rajan (2005), and Klingebiel, Kroszner and Laeven (2007), and Ramcharan, Verani and Vandenheuvel (2012)).

We analyze data on failures of nationally chartered banks in the period leading up to the Great Depression – between 1920 and 1929 – to examine the impact of changes in local financing capacity on recovery rates. With the onset of the Depression, not only did the number of bank failures mount significantly, but the sources of economic distress were more varied, rendering analysis more difficult. We therefore confine our analysis to the period before the onset of the Depression so that we can collect a fairly comprehensive and detailed dataset on failed banks with a common economic source of distress – agricultural loans gone sour.

To measure financing capacity in the market, we make use of the fact that in the early 20th century, physical distance helped to render credit markets local. During this period, few farmers had cars or phones. So proximity to the lender was essential. Indeed, even in the late 20th century, Petersen and Rajan (2002) find that physical proximity was important in determining credit access for small potential borrowers. Operationally then, for a given county, the banks within that county, as well as the banks in proximate counties constitute the local market willing to finance a failed bank's borrowers.

Using the county as the unit of data, we find that the fraction of a failed bank's assets recovered within three years after failure – the three-year recovery rate -- is strongly negatively related to subsequent bank failures in that county. Moreover, the relative size of the failed bank in the county seems related to recovery rates – higher the relative size of the failed bank, and thus lower the relative residual financing capacity in surviving banks, lower the subsequent recovery rate.

There are, however, alternative explanations of this finding than the diminution of financing capacity available in the local market; Recovery rates may have been lower in areas with more subsequent failures only because economic conditions were worse in those areas. In other words, poor economic conditions could be an omitted variable that drive both recovery rates and subsequent bank failures. We have included proxies for local economic conditions, most importantly, an annual index for average crop values in that county. However, as with any such endeavor, we cannot be confident that our proxies correct fully for local economic conditions.

Similarly, economic conditions are likely to be really bad if a large (and well diversified) bank fails. It may then not be surprising if the relative size of the failed bank in the county appears to be negatively correlated with subsequent recovery rates. We do therefore correct for the absolute size of the bank, and the effect of relative size still persists, nevertheless our interpretation could be questioned. More generally, any proxy for a loss of local financial capacity is likely also to be a proxy for local distress. It is therefore hard to disentangle the effects of a loss in financing capacity from the effects of an increase in economic distress on recovery values.

Limitations imposed by bank regulation do, however, offer a way of telling the two effects apart. Consider a county surrounded by other counties. Because the local financing market is likely to extend to neighboring counties, the recovery rate on a failed bank's assets is likely to be depressed by the failure of banks in neighboring counties, and hence the loss of local financing capacity. Of course, because economic conditions are likely to be similar in neighboring counties, bank failures there could be a proxy for economic conditions in the county of interest – thus far we have not solved the basic problem of identification.

However, in the 1920s and 1930s, states prohibited out-of-state banks from operating branches in their territories (see, for example, Kroszner and Strahan (1999)). Mortgage lending across state borders was prohibited by a number of states, and made significantly more difficult in others through regulations on the registration of collateral and bank director residency requirements. So bank failures in neighboring *in-state* counties proxy both for poor local economic conditions *and* a loss in local financing capacity, while bank failures in neighboring *out-of-state* counties proxy primarily for poor local economic conditions – since out-of-state banks did not lend to borrowers in the county of interest (also see the evidence in Rajan and Ramcharan (2013)). By examining the differential effects of neighboring in-state bank failures and neighboring out-of-state bank failures, we can identify the effect of a loss in local financial capacity.

We find that bank failures in neighboring in-state counties had a significantly more adverse effect on the recovery rate from a failed bank's assets than bank failures in neighboring out-of-state counties. In addition to depressing recovery rates, the prospect of fire sales should lead to both a fall in current asset prices (as investors anticipate the eventual fire sale) as well as a fall in transaction volume (see Diamond and Rajan (2011)). We find evidence consistent with this. Finally, we do find that a reduction in local financial capacity does foretell subsequent bank failures, suggesting the financial contagion predicted by the theory.

Of course, given these results, it would be interesting to know whether future bank failures remove financing capacity and cause low recovery rates or whether low recovery rates cause future bank failures, with contagion taking place through low asset prices. Certainly the last result does suggest the latter channel is at work, but the channels are not mutually exclusive.

One piece of evidence suggests the former channel is also at work. Our basic regression includes the share of assets in the bank relative to deposits in the county (in 1920). This is negatively correlated with the recovery rate, suggesting that relatively large banks consume more of available local financing capacity, and have lower recovery rates. Building on this idea, and our basic identification, we also include the assets in the bank relative to deposits in neighboring counties. Greater assets in a bank relative to bank deposits in neighboring in-state counties should have a negative effect on recovery rates if financing capacity matters, while greater assets in a bank relative to bank deposits in neighboring out-of-state counties should have more limited effect. This is indeed what we find.

Taken together, these findings suggest that the loss of financing capacity can disrupt local asset markets. And they suggest one mechanism through which a real shock might propagate itself through time, as the rapid liquidation of a failed bank's financial assets and the concomitant decline in asset prices engender further bank failures and asset price deflation. The rest of the paper is as follows. In section 1, we describe the historical background and, in section 2, the data; In section 3, we present the main results, and supporting results in sections 4 and 5, after which we conclude.

I. Historical Background

Farm land prices in the United States, and the value of farm output, boomed in the period leading up to 1920. The boom had its roots in strong US growth, but it accelerated as World War I disrupted European agriculture, even while demand in the United States was strong. The Russian Revolution in 1917 further exacerbated the uncertainty about supply, and intensified the commodity price boom, especially the price of wheat and other grains. The widespread belief was that "…European producers would need a very long time to restore their pre-war agricultural capacity…" (Johnson (1973, p178)). The national average of farmland values was 68 percent higher in 1920 compared to 1914, and 22 percent higher compared to 1919.

However, European agricultural production resumed faster than expected after the war's sudden end, and desperate for hard currency, the new Russian government soon recommenced wheat and other commodity exports. As a result, agricultural commodity prices plummeted starting in 1920 and declined further during the 1920s (Blattman, Hwang and Williamson (2007), Yergin (1992)).[4] Farm incomes fell 60 percent from their peak in 1919 to their depth in 1921. Farm incomes did recover steadily after that. Indeed, by 1922, farm incomes were back to the

[4] The price of a bushel of wheat fell from $3.08 in May 1920 to $1.68 in December; corn fell from $2.00 to $0.76 over the same period (Benner (1925)).

level they reached in 1916, before the 1917-1920 spike, and by 1929, were 45 percent higher still (though still short of their 1919 levels). So the “depression” in agricultural incomes was only relative to the heady levels reached in the period 1917-1920 (Johnson (1973), Alston, Grove, and Wheelock (1994)).

Unfortunately, farmers took on substantial amounts of debt as they expanded acreage in the boom times. Mortgage debt per acre increased 135% from 1910 to 1920, approximately the same rate of increase as the per acre value of the ten leading crops (Alston, Grove, and Wheelock (1994) citing Federal Reserve documents). Credit was widely available, as local banks, as well as life insurance companies, joint stock land banks and Federal land banks competed in some areas to provide credit (Alston (1983a, b)). Borrowers often only had to put down 10 percent of the amount, obtaining 50 percent from a bank, and getting a second or junior mortgage for the remainder (Johnson (1973)). Loan repayments were typically bullet payments due only at maturity, so borrowers had to make only interest payments until maturity. And as long as refinancing was easy, borrowers did not worry about principal repayment. The long history of rising land prices gave lenders confidence that they would be able to sell repossessed land easily if the borrower could not pay, so they lent and refinanced willingly. Debt mounted until the collapse in commodity prices put an end to the credit boom.

With borrowers unable to repay, banks started failing. Around 4,500 state chartered banks and 754 national banks were suspended in the period 1921-1929—a time when industry was largely booming. Suspended state banks were generally smaller than national banks, and suspended deposits during this period totaled $30 billion, roughly evenly split between state and national banks. Figure 1 shows the geographic range of the FDIC bank suspension rate across counties in the period 1921-1929. This agricultural depression before the Great Depression, characterized by a spate of bank suspensions concentrated in agricultural counties and compressed over a short period of time, offers us a way to test theories of asset liquidity and liquidation values.

II. Data

We hand-collected annual data between 1921 and 1929 on insolvent national banks placed in receivership as reported by the Office of the Comptroller of Currency (OCC) in its Annual Reports. These OCC Annual Reports identified 587 such banks over this period. By comparison, data from the FDIC, available in electronic form, cover 748 suspended national banks during this period (and also suspended state banks). Banks can be suspended and then possibly reopened without necessarily being placed in receivership, and data from the FDIC are based on this more general measure of banking distress. Nevertheless as Table 1 suggests, there are no systematic differences in coverage across regions between the FDIC data on suspensions, and the OCC's coverage of national banks in receivership. In what follows, we will use both sources of data, the more detailed OCC data for asset recoveries from banks placed into *receivership*, and the broader coverage of the FDIC data for the total number of *suspended* banks (state and national) in a county.

For each bank in receivership, the OCC's Annual Report provides information about the bank at the time of failure: capital stock at the time of the bank's organization; the date of organization; the date of failure; deposits at the time of failure; and total assets at the time of failure. Total assets are further decomposed into the value of assets expected to be recovered—"estimated good assets"; those assets of "doubtful value"; and those viewed to be "worthless" by the appointed receivers. In addition, the OCC reports annual information on asset recovery. For each bank, we collected this information on asset recovery over a three year window, beginning in the year of failure. Once a bank's assets have been collected to the extent possible, the bank is considered resolved.[5] Figure 2 contains pages from the report.

Importantly, we know the county in which the failed bank was headquartered. Because banking sector distress was initially driven by falling agricultural prices, we hand collected data from the 1920 Decennial Census on the acreage in each county devoted to five principal crops: corn, wheat, tobacco, cotton, and grains. Multiplying the share of acres devoted to each crop by the change in the world price of the crop, and then taking the sum of these acreage weighted price changes provides county level variation in the perceived shock to local agricultural fundamentals over the 1920s. Figure 3 depicts this county level variation in the perceived shock to local agricultural fundamentals, averaged over 1921-1929. Counties in the upper Midwest and the South suffered some of the sharpest deterioration in agricultural fundamentals during this period.

We also hand collected data from the US Agricultural Census of 1920 on the average mortgage debt to farm value ratios at the peak of the credit boom in 1920. Additionally we obtained annual data on land prices per acre, to serve as an additional measure of asset price declines. These data are hand collected from the Department of Agriculture (DOA) on actual market transactions of farm land for an unbalanced panel of counties observed annually from 1907-1936. These data are recorded from state registries of deed transfers, and exclude transfers between individuals with the same last name in order to better capture arm's length market transactions. From 1920 onwards, the FDIC provides data in electronic form on the total number of banks and the quantity of deposits in each county within both the state and national banking

[5] The National Bank Act requires receivers to collect "all debts due and claims belong to a bank, and upon the order of a court of competent jurisdiction, to sell or compound all bad or doubtful debts, and to sell all real and personal property in order to pay depositors and creditors, and the balance, if any to stockholders." See the Act of June 30 1876 Sec. 1; 19 Stat L. 63, and Sec 5234.

systems. The FDIC also provides data on the number of suspended state and national banks, as well as the fraction of deposits in suspended banks, in each county every year. We will use these data as a measure of the loss of local financing capacity.

In Figures 4A and 4B, we plot respectively the number of national bank receiverships each year and the median three year recovery rate for bank assets—the ratio of total assets collected over a three year window after the year of failure divided by total assets at the time of failure. The number of bank receiverships over time is bimodal, with peaks in 1924 and 1927. The median recovery rate drops sharply as the number of receiverships rise, reaching its nadir around 1924. The recovery rate then rises, as receiverships decline, but plateaus once receiverships spike again in 1927.

In the top panel of Table 2, we present summary data in 1920 for those counties that had national banks present in 1920, but no national bank suspensions throughout the decade. The bottom panel contains summary data for the subset of counties that experienced at least one national bank suspension in the decade. Across both subsamples, the level of leverage appears similar, as does the local run-up in commodity prices and the subsequent distress in agriculture in the county.

However, consistent with the results in Rajan and Ramcharan (2012), credit availability, as proxied for by either the log number of banks or banks per capita, at the peak of the boom in 1920, is significantly greater in those areas that also suffered greater banking sector distress. It would seem then that pre-existing local economic conditions, along with the local structure of banking, could matter both for subsequent banking fragility and the evolution of asset recovery rates within in a county, and in what follows, we consider a number of ways to control for these and other potential explanations when assessing the importance of local financial capacity in shaping asset recovery.

III. Main Results

III A. Basic Analysis of Liquidation Values

In this subsection, we document some basic correlations between bank suspensions and asset recovery rates. The dependent variable in our basic regression in Table 3 is the fraction of assets that are recovered in a failed national bank within three years after the bank is placed in receivership. The explanatory variable in column 1, which we include along with state indicators, is the sum of deposits in both state and national banks that are suspended in that county over the same three year window, expressed as a fraction of total deposits within the county in the year of failure. Note that in what follows, whenever we measure financing capacity (or the loss of financing capacity due to suspensions), we include both state and national banks in the computation, since aggregate bank financing capacity in the county is what matters.[6]

As predicted, recovery rates are strongly negatively correlated with the share of subsequent failed deposits. As we move from the 50th to the 75th percentile in the share of failed deposits, about a 16 percentage point increase, there is a 3.2 percentage point decline in the three year recovery rate. To put these magnitudes in further context, the median three year recovery rate in the sample is 51.7 percent, suggesting that the economic relationship between local financing capacity and asset recovery might be large.

[6] We do not include other sources of finance in part because our thesis is that bank loans are special and have a limited market, which is why banking capacity matters. Comingling with other sources of finance might be inappropriate. Also, although national banks were larger and may have served somewhat larger clients than state banks, we have not found significant differences between their behavior in previous work on the dimensions we explore here. Therefore, in our view, the combined deposits of state and national banks is the best measure of aggregate financing capacity.

In column 2, we add a number of the failed bank's characteristics that might influence recovery rates. These include the log of the bank's assets (as a measure of absolute bank size), the ratio of the failed bank's assets to total county deposits at the time of failure (as a measure of the relative size of assets that need to be refinanced and, concomitantly, the loss of financing capacity at the time of failure), the bank's capital at the time of set up relative to total assets in the year of failure, as well as the bank's deposit to asset ratio in the year of failure.

Not all of the aforementioned bank level observables are available for each bank, so the sample size in column 2 is lower by about 12 percent. Nevertheless, the negative relationship between suspended deposits in a county over the three year recovery window and the recovery rate of failed banks headquartered in that county remains negative and significant at the one percent level. The theory suggests that relatively large bank failures, with failing bank assets measured relative to total deposits in the county, might overwhelm the financing capacity of a county. These are indeed associated with lower recovery rates. A one standard deviation increase in the ratio of failed bank assets to county deposits is associated with a 0.11 standard deviation decrease in the recovery rate.

We also see that failed banks initially organized with large amounts of capital (relative to assets at the time of failure) tended to have lower recovery rates. This is consistent with our reading of contemporary documents which suggest that capital requirements may have affected bank risk taking incentives. The Economic Policy Commission (1935) observes for example that as the pool of "good business" shrank during the agricultural depression of the 1920s, banks organized with large amounts of capital may have sought lower grade risks in order to generate earnings commensurate with their capital investment.

Thus far, the evidence is consistent with the idea that local financing capacity might feature prominently in shaping recovery rates. But the correlation between recovery rates and subsequent bank failures might also be driven by deteriorating economic fundamentals in the county, as the latter can both depress bank recovery rates and also engender more local bank failures.

In column 3, we attempt to control for some of these fundamentals by including a number of demographic, geographic and economic controls. These controls include the total population in the county; the urban and African-American populations; the number of people between the age of 5-17 years old; the number illiterate; the value of manufacturing added relative to agriculture; the value of crops; the number of farms; the total number of banks in 1920; the area of the county, and the county's distance from key waterways. These variables are observed in 1920 and help measure potentially important pre-existing county characteristics.

Column 3 also includes the commodity index observed both at the time of failure and averaged over the subsequent recovery window. We also include the annual change in imputed state per capita income averaged over the subsequent recovery window. The negative correlation between bank suspensions and asset recovery remains virtually unchanged from column 2. The controls in column 3 may, however, only partially capture economic conditions in a county, and we cannot rule out the possibility that future bank suspensions still continue to proxy for poor economic conditions. We now turn to bank regulations of the era to better identify the role of financing capacity in shaping asset recovery.

III B. In-state and out-of-state neighbors

In 1920, regulatory prohibitions on inter-state bank branching prevented in-state banks from opening branches across state lines in order to originate out-of-state loans. To prevent bankers from simply seeking a bank charter across state lines to gain out-of-state business, some states such as Florida also imposed residency requirements on the directorate of banks (The Bankers Encyclopedia, 1920).[7] Some states, such as New Jersey in its 1909 banking statute, also directly barred out of state banks from originating business in-state, unless there were bilateral arrangements with the states from which the banks were chartered. Other states severely restricted the types of mortgage related transactions that their banks could engage in across state lines, imposing limits for example on the types of properties that could be used as collateral or aggregate limits on out-of state exposures (Barnett (1911)).[8]

State laws also typically required the recording of both real estate and chattel mortgages in both the county in which the property was located, as well as in the county of loan origination. For any bank seeking to originate credit across state lines, these requirements significantly increased origination costs, as seizing collateral in the case of non-repayment, required these often small rural banks to be familiar with judicial practices across state lines, and to retain lawyers able to practice across state lines (The Bankers Encyclopedia, 1920).[9] These regulations made cross-state-border lending more difficult, and provide a relatively powerful test to help distinguish the importance of financing capacity from latent economic fundamentals in shaping asset recovery.

The test builds on the idea that the costs of banking at a distance implies the local lending market for a county includes both in-county banks as well as banks in neighboring counties. These neighboring counties could be *in-state* or *out-of-state*. However, because of the difficulty,

[7] Florida for example required 60 percent of a bank's board to have been state residents the previous year.

[8] Some entities sought to overcome these prohibitions by creating bank holding companies, which could operate banks across state lines, but in this case each bank within the banking group was largely responsible for its own funding and made its own lending decisions**.**

[9] These legal and other impediments to the flow of credit across state lines often had strong political motives. For example, even in the midst of the wave of Depression era banking reforms, a bill introduced by Carter Glass allowing national banks to branch in all states, *and to be able to branch up to 50 miles across the state boundary line* was defeated in 1932, with the opposition led by the famous populist Huey Long (Westerfield (1939)).

if not outright prohibition on cross-state-border lending, while bank suspensions in neighboring in-state counties proxy both for poor local economic conditions *and* a loss in local financing capacity, bank suspensions in neighboring out-of-state counties proxy largely for poor local economic conditions only. That is, although economic conditions are similar across state lines, out-of-state banks would find it difficult, if not impossible, to lend across state lines, and thus the suspensions of out-of-state banks would be unlikely to detract from financing capacity across state lines.

Therefore, by examining the difference in the influence of neighboring equidistant in-state bank suspensions and neighboring out-of-state bank suspensions on recovery rates, we can identify the effect of a loss in local financial capacity on recovery rates. Furthermore, even within a specific state, the influence of in-state bank suspensions on financing capacity should diminish with distance, as informational and other frictions would be expected to hinder the ability of more distant banks to influence financing capacity in the county of interest.[10]

In Table 4 column 1, we restrict the sample to those counties within 90 miles of a state border. We then include in the baseline regression (Table 3, column 3) the suspension rates for banks in neighboring *in-state* counties within 30 miles of the county, within 30-60 miles, and within 60-90 miles of the county in neighboring *out-of-state* counties within 30 miles of the county in which the failed bank is headquartered. Throughout the suspension rate is defined as the total value of suspended deposits (both national and state banks) in neighboring counties within the relevant distance increment over the three years after the failure of a given bank

[10] The role of distance in shaping lending would be expected to be larger in unit banking versus branching states. In the latter, banks could use branches to more easily supply credit to farmers away from major towns. However, about 80 percent of the failed national banks occurred in unit banking states, and we do not have enough data to examine the effects of differences in branching regulations across states.

divided by total deposits in the banking system over the same area at the beginning of the time period.

The evidence suggests that local financing capacity significantly influences asset recovery. The point estimate on the suspension rate within the county remains large and significant at the one percent level. But the coefficient on the suspension rate in counties up to 30 miles away is only slightly smaller and is significant at the five percent level. This coefficient suggests that a one standard deviation increase in the suspension rate is associated with a 0.14 standard deviation decrease in the recovery rate.

These effects also decay with distance. Neither the coefficients on in-state bank failures in the 30-60 mile or the 60-90 mile increments suggest significant adverse effects on recovery rates. Moreover, the coefficient on the suspension rate in counties up to 30 miles away but across state lines is small, statistically insignificant, and different from the corresponding equidistant in-state coefficient at the five percent level (p-value=0.02). These differences across state lines, as well as with distance, are consistent with the idea that the negative relationship between the suspension rate and asset recoveries likely reflects a loss of financing capacity, rather unobserved adverse economic conditions.

We replicate the analysis using different border intervals. In column 2, we include in-state counties within 80 miles of the failed bank's county, broken into 40 mile increments, while in column 3, we include in-state counties within 100 miles of the border, but in 50 mile increments. Throughout, the point estimate on the bank suspension rate within the reference county remains largest, closely followed by the point estimate on the suspension rate in the nearest in-state distance increment. The negative impact of neighboring county bank suspensions on the recovery rate from the failed bank's assets diminish with distance, and is never large or statistically significant when the neighboring counties are across state borders.[11]

In what follows, we will use the regression in Table 4 column 3 (counties within 100 miles) as our baseline regression. The regressions for other distances are available from the authors and are not reported to save on space.

We have the one year recovery rate on failed bank assets. While one year may be too short a time to capture the full recovery on assets, we can combine the three year and one year recovery rates to create a panel. The panel structure in turn allows us to use failed bank fixed effects to control non-parametrically for any time invariant bank level unobservables--geography, bank management and local market structure at the time of failure—that might influence asset recovery, and possibly local financing capacity. We again see evidence of local financing capacity in shaping asset recovery, as the adverse effects of the increase in neighboring county bank suspensions between 1 to 3 years period after a bank's failure on the reduction in asset recovery over that period are seen only for suspensions in nearby in-state counties (see Table 5 column 1).

An issue of independent interest is how much the eventual realizations from assets might be a surprise relative to what was anticipated at the time of the bank's failure. We have data on the estimates made by bank examiners of "good" assets at the time of the bank's failure. In Table 5 column 2, the dependent variable is the ratio of the value of assets recovered over the three year window relative to the value of assets estimated "good" at the time of failure, with all columns also including the standard suite of bank, county and state controls. To control for the

[11] Results are similar –available upon request—if the 100 mile window is decomposed into 25 mile increments as well.

impact of local banking sector distress on the formation of these asset recovery expectations, we control as well for the suspension rate in the county the year before failure.

From column 2 of Table 5, nearby in-state suspensions over the three year recovery window appears to lower asset recovery volumes relative to initial expectations. A one standard deviation increase in the suspension rate at the 0-50 mile in-state radius is associated with a 0.17 standard deviation decline in the ratio of recovered assets relative to assets judged "good" at the time of failure. By contrast, the coefficient on suspensions in out-of-state counties is about 2.5 times smaller than its equi-distant in-state counterpart and statistically insignificant.

IV. Land Prices, Land Transactions and Bank Failures

IVA. Land Prices and Transactions

A fall in financing capacity as a result of bank suspensions should lead directly to more severe fire sale pricing as well as a direct fall in transaction volume (see, for example, Diamond and Rajan (2011)). To test this potential connection between bank suspensions, asset prices and transaction volume, we collected annual data from 1920-1929 on the average price of land for a panel of about 350 counties, as well as data on the number of land transactions in each of those counties. To reduce the impact of noise in the estimation, we collapse the annual data into a panel of three non overlapping periods:1920-1923, 1924-1926 and 1927-1929, averaging the price level in each county in each period.

In Table 6 column 1, we report the results from estimating the impact of the ratio of suspended deposits to total deposits in the previous period on the log of the average price of land in each county, where we report the somewhat more conservative standard errors that cluster by both state and time period (Cameron, Gelbach, and Miller (2011)). We continue to include bank suspensions both in the reference county as well as in nearby in-state and out-of-state counties, computed over various distance increments. We also control for state and time fixed effects, along with the log price of land in the previous period.

There is a large significant negative estimated association between bank suspensions within the county of interest and the log price of land in Table 6 column 1. The coefficient on in-state neighboring county suspensions is also large and negative but measured imprecisely. The coefficient on neighboring out-of-state suspensions is small and statistically insignificant. We repeat the analysis in Table 6 column 2 using US Census data on land prices in 1920 and 1930. These are survey data of land prices, but are available for the full sample of US counties. They thus allow us to estimate coefficients more precisely. The dependent variable in column 2 is the log price per acre of farm land in 1930, and we control for state fixed effects, as well as the log price per acre in 1920 in order to control for any temporary factors that might shape land prices. The point estimate on in-state bank suspensions located in counties up to 50 miles away is now negative and significant and is about 52% larger in magnitude than the coefficient estimate on suspensions in out-of-state neighboring counties.

A decline in financing capacity is expected to lead to not only a decline in asset prices, but also transaction volumes, as the market becomes less liquid amid expectations of future deflation and a lack of credit availability. We focus in Table 7 column 1 on this prediction. The dependent variable is the log of the number of land market transactions within a county. As in Table 6 column 1, we collapse the decade into three non-overlapping panels. The impact of bank suspensions on transaction volume appears sizeable and again this effect is limited to nearby in-state counties. A one standard deviation increase in the ratio of suspended deposits to total deposits in a neighboring in-state county (0-50 miles away) in the previous period is associated with a 0.02 standard deviation decline in the log number of properties transacted in the current period. By contrast, the coefficient on suspensions in similarly distanced out-of-state counties is small, positive, and statistically insignificant.

We also have data on the number of acres transacted, another measure of transaction volume which is less dependent on the size of each transaction. The results in Table 7 column 2, which uses the log number of total acres transacted in a county as the dependent variable, are qualitatively similar to those in Table 7 column 1, but the implied effect of banking sector distress are somewhat larger: a one standard deviation increase in the ratio of suspended deposits to total deposits in a neighboring in-state county (0-50 miles away) in the previous period is associated with a 0.06 standard deviation decline in the log number of properties transacted in the current period

IVB. Bank Failures

Fire sales suggest a channel of contagion. If land prices are depressed because of a loss of financing capacity, it should depress the values of solvent banks, and perhaps lead some of them to fail. This argument would then suggest a positive association between past banking sector distress in a location and subsequent distress within the same location. Moreover, if indeed this positive association reflects a loss of financing capacity and contagion rather than omitted adverse economic shocks, then any positive association between past and current banking sector distress should be considerably smaller across state lines.

In Table 8 the dependent variable is the bank suspension rate computed from the FDIC data, in county i observed annually between 1920 and 1929. In column 1, we include the suspension rate within the county in the previous period, as well as the rate computed among nearby in-state and out-of-state counties. Past nearby in-state bank suspensions appear to be positively associated with current bank suspensions. For example, from column 1, a one standard deviation increase in the bank suspension rate in the previous year among in-state counties located 0-50 miles away is associated with a 0.05 standard deviation increase in the suspension rate in the reference county in the current year. The point estimate on suspensions among out-of-state counties is not statistically significant, and is much smaller than its in-state counterparts.

V. Financing Capacity or Contagion

Of course, given these results, it would be interesting to know whether future bank failures remove financing capacity and cause low recovery rates or whether low recovery rates cause future bank failures, with contagion taking place through low asset prices – do our results reflect the loss of financing capacity or contagion. One way to gauge the importance of the reduction in financing capacity rests on examining the relationship between the potential supply of aggregate liquidity in the local area at the peak of the boom, in 1920, and the subsequent asset recovery rates for failed banks in the area. Recovery rates are likely to be high in those areas where the size of the bank that subsequently failed is relatively small compared to the initial available financing capacity in the market. In contrast, asset recovery is likely to be considerably lower when the quantity of assets to be liquidated dwarfs the potential aggregate liquidity available from nearby banks in the area. Indeed, recovery rates are likely to be lowest when there are no nearby banks able to purchase the assets of the failed bank.

In Table 9 column 1, the dependent variable is the three year recovery rate. The explanatory variables (along with those in the baseline regression) are the ratio assets of the failed bank scaled by deposits of banks in the county other than the failed bank, as well as assets of the failed bank scaled by deposits in nearby counties, with all deposits and assets measured in 1920. The right hand side variables are thus a measure of the potential relative financing capacity outside the bank in 1920 for the bank's assets. Large banks would have relatively lower outside financing capacity, as would banks in areas that have little banking in neighboring counties.

The evidence in column 1 of Table 9 suggests that asset recovery rates were higher for those failed banks that were small relative to aggregate liquidity in 1920 in the local area. Also, consistent with the idea that these results are not driven by latent economic factors, these effects are large for banking capacity in neighboring (within 50 miles) counties, but do not extend across state borders. The coefficient on relative banking capacity in neighboring out of state counties is $1/6^{th}$ the size of the coefficient on neighboring in-state counties at the same distance. Thus available banking capacity to buy failed bank assets does seem to matter, and does affect eventual recovery rates.

VI. Conclusion

Can the loss of financing capacity cause assets to sell at a discount relative to fundamental value? Can it also render asset markets more illiquid? And can these forces lead to contagion, propagating shocks through time. This paper has used a new dataset drawn from the epidemic of national bank failures just before the Great Depression in order to shed light on these questions. Banking regulators of the time liquidated the assets of failed banks as quickly as possible. At the same, state regulations, which limited bank branching across state lines, combined with the transactions costs imposed by distance, helped to segment local banking markets. We then have an almost ideal laboratory to study these questions.

We find evidence that recovery rates among failed banks were significantly lower in areas with more banking sector distress. We also find that local financial sector distress was associated with lower land prices and a decrease in land transactions. We also find evidence that bank suspensions were spatially and temporally correlated, but only within those geographically proximate areas in the same state, suggesting that contagion stemming from the effects of asset liquidation on local land prices might be a key channel in transmitting banking sector distress.

We are, of course, not the first to suggest that financial liquidity matters. However, by tying the decline in recovery rates, asset prices, and transaction volume to a loss in local financing capacity, this paper may provide tentative evidence in favor of theories that emphasize aggregate liquidity, or equivalently, "cash in the market" pricing, as an important source of financial distress and crises.

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Figures and Tables

Figure 1. Bank Suspension Rate (FDIC data).

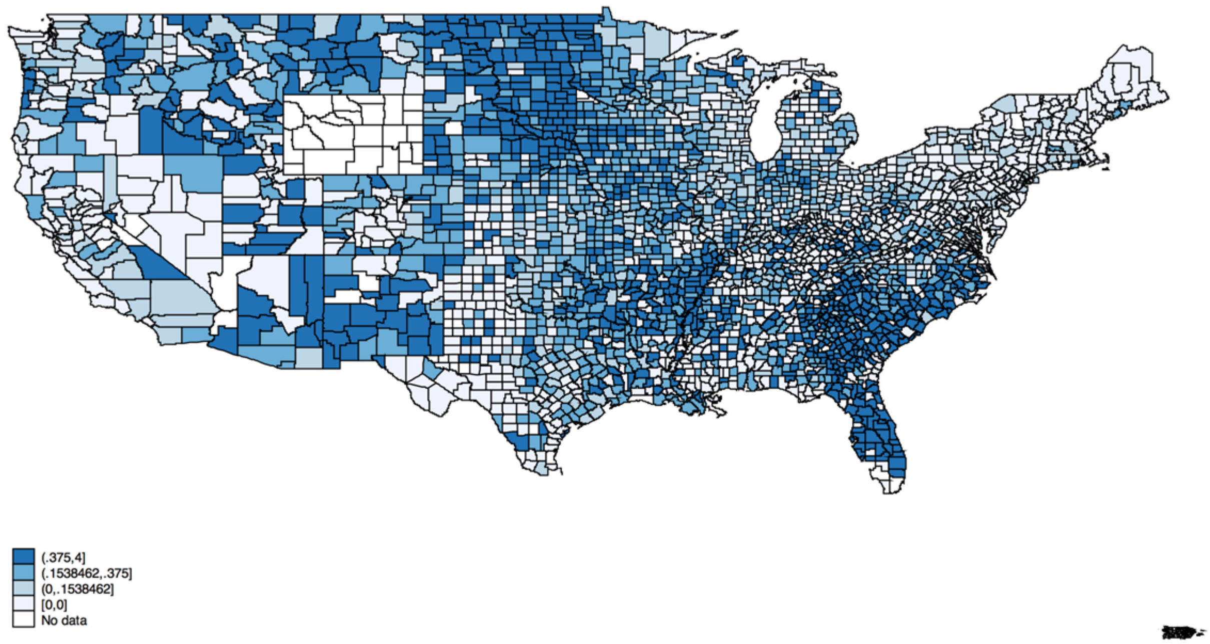

Figure 1 shows the bank suspension rate—the total number of banks suspended from 1921-1929 divided by the total number of banks in 1920—for US counties. The data are from the FDIC dataset.

Table 1. OCC Failures and FDIC Suspensions, by Census Regions.

Region	OCC Failed Banks 1920-1929	FDIC Suspended Banks 1920-1929	Number of National Banks in 1920
New England	3	3	410
Mid Atlantic	12	19	1593
East North Central	39	49	1386
West North Central	259	308	1598
South	102	140	1306
Border	49	73	805
Mountain	99	125	480
Pacific	24	31	442

Table 1 reports the number of OCC recorded failed banks, FDIC suspended banks, and the number of national banks in 1920, by Census geographic regions.

Figure 2. A Sample of Raw Data

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TABLE No. 43.—*National banks in charge of receivers, dates of organization, amounts collected from all sources, loans paid and other disbursements, losses on assets returned to stockholders to year ended October 31, 1924*

	Title and location of bank	Date of organization	Capital stock	Receiver appointed
400	Pynchon National Bank, Springfield, Mass	Apr. 7, 1865	$200, 000	June 24, 1901
469	Farmers and Drovers National Bank, Waynesburg, Pa	Feb. 25, 1865	200, 000	Dec. 12, 1906
513	First National Bank, Billings, Mont	Dec. 27, 1883	150, 000	July 2, 1910
515	Mount Vernon National Bank, Mount Vernon, N. Y	Dec. 11, 1906	200, 000	Apr. 19, 1911
523	Second National Bank, Clarion, Pa	Sept. 12, 1883	50, 000	June 21, 1912
531	Traders National Bank, Lowell, Mass	June 10, 1892	200, 000	Oct. 20, 1913
533	Mesa County National Bank, Grand Junction, Colo	May 31, 1905	100, 000	Nov. 29, 1913
542	First National Bank, Pensacola, Fla	Aug. 10, 1880	500, 000	Jan. 22, 1914
549	First National Bank, Sutton, W. Va	Aug. 17, 1902	50, 000	Aug. 29, 1914
554	First National Bank, Uniontown, Pa	Feb. 20, 1864	100, 000	Jan. 19, 1915
582	First National Bank, Bowling Green, Ohio	May 23, 1889	50, 000	Jan. 5, 1917
587	First National Bank, St. Cloud, Fla	Mar. 24, 1912	50, 000	Jan. 2, 1918
590	First National Bank, Bluffton, Ohio	Nov. 19, 1900	50, 000	Nov. 17, 1919
591	First National Bank, Newman, Calif	May 29, 1910	50, 000	Jan. 31, 1920
593	First National Bank, Eureka, S. Dak	Nov. 28, 1919	50, 000	Aug. 20, 1920

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appointment of receiver, and closing, with amounts of nominal and additional assets, assets, expenses of receiverships, claims proved, dividends paid, and remaining

Nominal assets at date of suspension			Additional assets received since date of suspension	Total assets	Offsets allowed and settled	Loss on assets compounded or sold under order of court	
Estimated good	Estimated doubtful	Estimated worthless					
$755, 664	$942, 113	$8, 482	$124, 059	$1, 830, 318	$39, 884	$280, 140	400
814, 783	2, 013, 406	130, 499	2, 060, 394	5, 019, 082	546, 299	1, 422, 242	469
1, 087, 304	505, 016	552, 201	629, 583	2, 774, 104	218, 280	131, 667	513
158, 243	413, 533	199, 574	225, 397	996, 747	39, 047	594, 714	515
126, 110	294, 805	19, 304	52, 807	493, 026	49, 067	83, 630	523
1, 610, 081	1, 603, 429	30, 913	130, 168	3, 374, 591	148, 383	379, 443	531
200, 412	248, 785	165, 264	52, 069	666, 530	32, 124	209, 679	533
1, 488, 390	507, 052	401, 444	1, 072, 359	3, 469, 245	647, 368	690, 698	542
310, 050	80, 899	27, 210	35, 199	453, 358	12, 883	16, 668	549
1, 080, 785	2, 388, 710	47, 999	970, 193	4, 487, 687	330, 370	193, 610	554
580, 259	283, 028	46, 827	179, 140	1, 089, 254	202, 146	289, 986	582
98, 696	138, 332	210, 960	35, 281	483, 269	46, 715	27, 629	587
453, 226	121, 751	6, 352	93, 369	674, 698	117, 300	13, 441	590
260, 893	454, 549	510, 587	195, 190	1, 421, 219	195, 097	579, 534	591
750, 777	192, 169	32, 304	122, 116	1, 097, 366	92, 811	23, 499	593
279, 978	78, 894	125, 972	62, 271	547, 115	164, 770	90, 151	594

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TABLE No. 43.—*National banks in charge of receivers, dates of organization, amounts collected from all sources, loans paid and other disbursements, losses on assets returned to stockholders to year ended October 31, 1924*—Continued

	Nominal value of remaining assets	Collected from assets	Collected from assessment upon shareholders	Total collections from all sources	Loans paid and other disbursements	Dividends paid	Legal expenses	Receivers' salary and other expenses
400	------------	$1, 510, 294	$44, 483	$1, 554, 777	$353, 507	$1, 130, 337	$22, 377	$39, 298
469	$1, 456, 909	1, 593, 632	149, 271	1, 742, 903	283, 472	1, 286, 325	51, 749	66, 155
513	560, 204	1, 863, 953	7, 500	1, 871, 453	299, 448	1, 387, 675	25, 975	137, 632
515	1	362, 985	81, 730	444, 715	102, 544	272, 397	39, 765	26, 916
523	63, 764	296, 565	28, 736	325, 301	8, 107	269, 707	9, 226	22, 323
531	158, 531	2, 688, 234	91, 071	2, 779, 305	31, 588	2, 659, 658	15, 851	66, 302
533	105, 652	319, 075	35, 135	354, 210	28, 192	239, 033	5, 789	29, 183
542	318, 593	1, 812, 586	73, 748	1, 886, 334	293, 584	1, 472, 354	32, 934	67, 863
549	29, 255	394, 552	25, 180	419, 732	24, 132	315, 272	39, 166	25, 716
554	612, 850	3, 350, 857	------------	3, 350, 857	1, 033, 139	1, 665, 079	55, 986	129, 234
582	------------	597, 122	41, 695	638, 817	15, 183	562, 519	20, 339	39, 877
587	253, 556	155, 369	45, 161	200, 530	25, 315	139, 774	4, 288	21, 367
590	68, 539	475, 418	47, 900	523, 318	34, 039	422, 775	7, 913	30, 577
591	------------	646, 588	44, 772	691, 360	224, 189	415, 502	10, 395	35, 063
593	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Figure 2 reproduces an excerpt of the 1924 Report of the Comptroller of Currency.

Figure 3. Change In Commodity Price Index

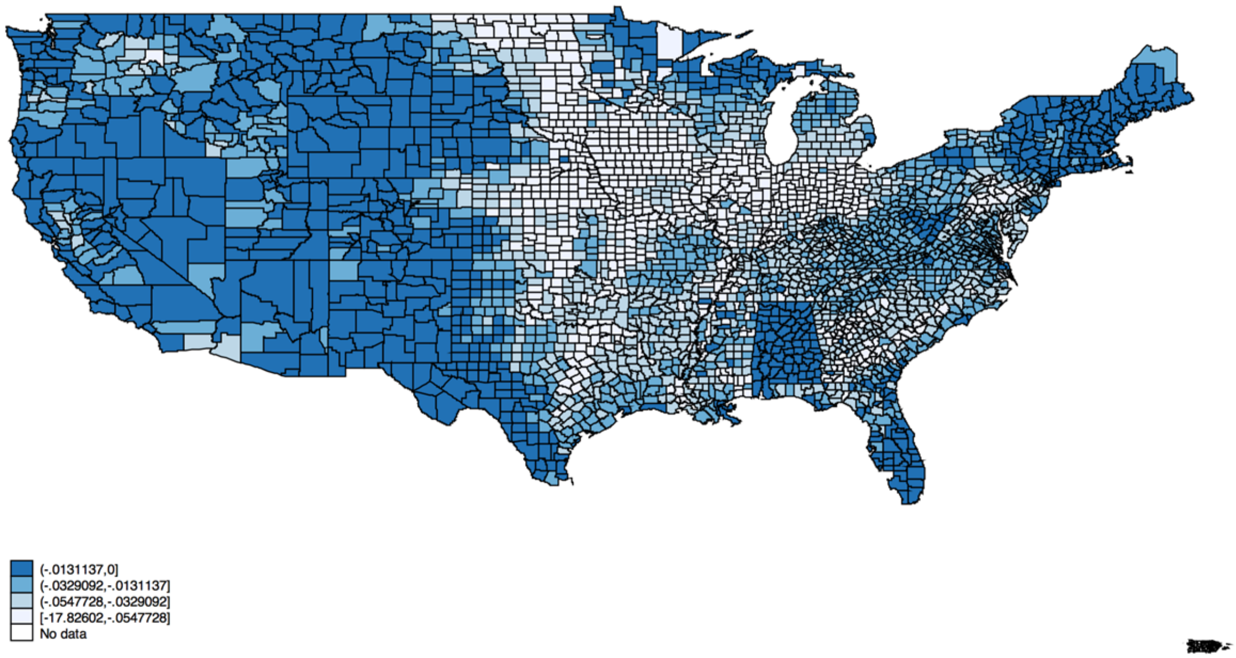

Figure 3 plots the change in the commodity index, based on prices in 1920-1929, and acreage shares in 1920—see appendix for detailed description.

Figure 4A. Number of failed national banks

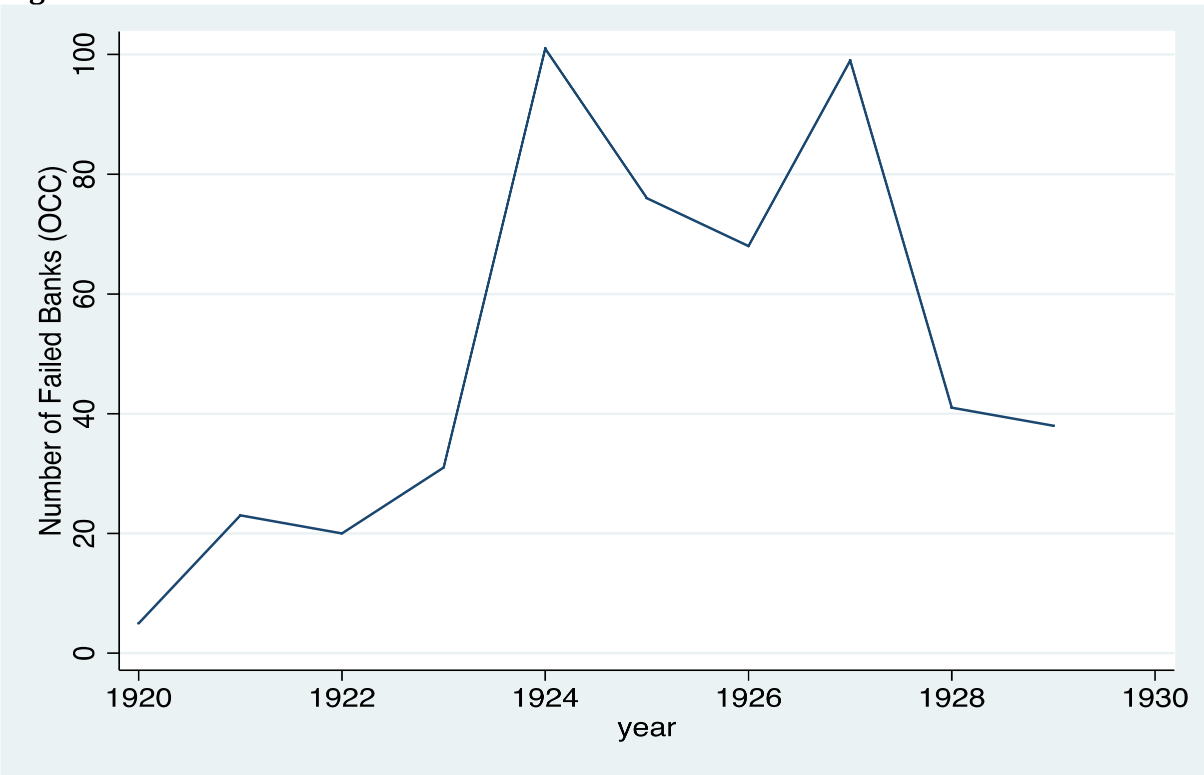

Figure 4B. Three year recovery rates of failed national banks

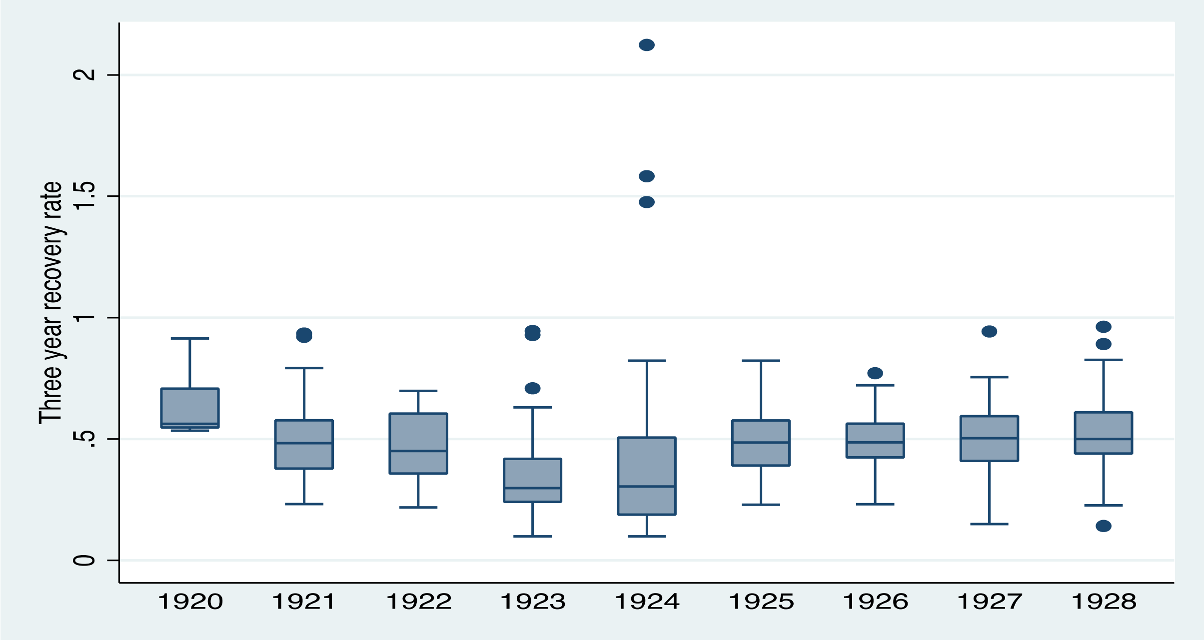

Figure 4A plots the number of national banks placed in receivership by the OCC. Figure 4B shows the box plot of three year recovery rates of national banks. The shaded rectangles represent the interquartile range of recovery rates, while the solid line within the rectangle depicts the median recovery rate. The solid line at the end shows the 1 and 99 percent values, while the dots are extreme observations.

Table 2. Selected Summary Statistics

	National banks present in county, no national bank suspensions in county, 1920-1929			
	Mean	Median	Standard deviation	Number
Debt per acre, 1920	30.15	21.54	39.29	1689
Log banks	2.27*	2.30	0.64	1775
Banks per area	8.21	6.48	7.18	1759
Banks per capita	0.47*	0.38	0.33	1761
Commodity Shock, 1917-1920	4.14	3.76	3.03	1735
Commodity Shock, 1921-1929	-0.06	-0.03	0.44	1777
Bank suspension rate	1.41*	0.26	2.13	1772
Deposit suspension rate	0.90*	0.00	1.69	1772
	At least one national bank suspension in county, 1920-1929			
	Mean	Median	Standard deviation	Number
Debt per acre, 1920	30.83	23.21	28.01	473
Log banks	2.53*	2.56	0.60	506
Banks per area	8.13	6.96	6.33	497
Banks per capita	0.74*	0.63	0.44	497
Commodity Shock, 1917-1920	4.38	4.23	3.20	559
Commodity Shock, 1921-1929	-0.04	-0.03	0.11	642
Bank suspension rate	5.43*	4.63	3.78	498
Deposit suspension rate	4.98*	4.07	3.92	498

* denotes that the means across the two subsamples are statistically different at the one percent level or better.

Table 3. Basic Analysis of Asset Recovery.
Dependent Variable: Three Year Asset Recovery Rate

	(1)	(2)	(3)
VARIABLES	no controls	bank controls	bank&county controls
bank (deposits) suspension rate	-0.201***	-0.170***	-0.162***
	(0.0287)	(0.0312)	(0.0331)
capital asset ratio		-0.177**	-0.182**
		(0.0717)	(0.0808)
deposit asset ratio		0.0492	0.0451
		(0.0365)	(0.0361)
assets to county deposits		-0.0273***	-0.0222*
		(0.00715)	(0.0114)
log of bank assets		0.0141	0.0152
		(0.0101)	(0.0133)
Area, log			0.00105
			(0.0202)
Mississippi distance, log			0.0167
			(0.0110)
Atlantic distance, log			0.0147
			(0.0379)
Great lakes distance, log			-0.0737**
			(0.0309)
Pacific distance, log			-0.0864***
			(0.0209)
Black population, log			0.0101
			(0.00734)
Urban population, log			0.00158
			(0.00178)
Illiterate population, log			-0.0112
			(0.00766)
Population 5-17 years, log			-0.159
			(0.117)
Total population, log			0.125
			(0.134)
Manufacturing share			-0.0381
			(0.0691)
Value of crops, log			0.0102
			(0.0173)
log number of farms			0.0209
			(0.0195)
commodity index in year of failure			-0.0271
			(0.0327)
log number of banks, 1920			0.0149
			(0.0282)
the commodity index, over three year window			0.00605
			(0.257)
change in state per capita income			-0.233
			(0.359)
Observations	433	379	363
R-squared	0.376	0.428	0.488

Standard errors clustered at state level (in parentheses): *** p<0.01, ** p<0.05, * p<0.1. All regressions include state fixed effects, and year dummies based on year of failure.

Table 4. Recovery Rates and Bank Suspensions across Borders and at a Distance
Dependent Variable: Three Year Asset Recovery Rate

	(1) 30 miles	(2) 40 miles	(3) 50 miles
bank (deposits) suspension rate over failure horizon	-0.104***	-0.173***	-0.128***
	(0.0288)	(0.0304)	(0.0353)
In-State, bank suspension rate, 0-30 miles	-0.0943**		
	(0.0450)		
In-State, bank suspension rate, 30-60 miles	-0.0579		
	(0.0400)		
In-State, bank suspension rate, 60-90 miles	0.123		
	(0.100)		
Out-of-State, bank suspension rate, 0-30 miles	0.0377		
	(0.0499)		
In-State, bank suspension rate, 0-40 miles		-0.0875**	
		(0.0417)	
In-State, bank suspension rate, 40-80 miles		0.136	
		(0.114)	
Out-of-State, bank suspension rate, 0-40 miles		0.0108	
		(0.0404)	
In-state,bank suspension rate, 0-50 miles			-0.115**
			(0.0494)
In-state,bank suspension rate, 50-100 miles			0.110
			(0.0685)
Out-of-state,bank suspension rate, 0-50 miles			0.0174
			(0.0314)
Observations	252	226	259
R-squared	0.603	0.670	0.625

Standard errors clustered at state level (in parentheses): *** p<0.01, ** p<0.05, * p<0.1. All columns include the bank and county level controls from Table 3, column 3. Columns 1-3 restrict the sample to banks in counties up to 90,80 and 100 miles from a state border respectively.

Table 5. Recovery Rates and Bank Suspensions across Borders and at a Distance: Further Checks.

	(1) Panel	(2) Expected Recovery Rate
In county bank suspension rate	-0.204***	-0.605*
	(0.0725)	(0.345)
In-state, bank suspension rate, 0-50 miles	-0.127*	-1.767*
	(0.0725)	(0.918)
In-state, bank suspension rate, 50-100 miles	0.0168	0.410
	(0.0465)	(0.749)
Out-of-state, bank suspension rate, 0-50 miles	0.0700	-0.709
	(0.0665)	(0.550)
Observations	251	264
R-squared	0.47	0.599

The dependent variable in column 1 is the realized asset recovery rate. The panel consists of data both in the year of failure as well as three years after failure. The panel includes bank fixed effects, and allows for state by year fixed effects. In column 2, the dependent variable is the ratio of the value of assets recovered over the three year window relative to the value of assets estimated "good" at the time of failure. Column 2 includes the bank and county level controls from Table 3, column 3, as well as the suspension rate in the county before the year of failure. Standard errors clustered at state level (in parentheses): *** p<0.01, ** p<0.05, * p<0.1

Table 6. Land Prices and Bank Suspensions

	(1)	(2)
	land price	
	Market transactions	US Census
price per acre, previous period	0.911***	0.874***
	(0.0115)	(0.0372)
ratio of suspended deposits in county to total deposits in county, previous period	-0.791***	-1.408***
	(0.102)	(0.241)
In-state,50 miles, ratio of suspended deposits in counties to total deposits in counties, previous period	-0.597	-1.966**
	(0.614)	(0.922)
In-state,50-100 miles, ratio of suspended deposits in counties to total deposits, previous period	0.0847	-1.749**
	(1.015)	(0.862)
Out-of-state,50 miles, ratio of suspended deposits in counties to total deposits, previous period	-0.0278	-1.295***
	(0.0962)	(0.350)
Observations	378	1,310
R-squared	0.963	0.883

The dependent variable in column 1 is the log market price of land available for an annual panel of counties. Column 1 collapses this panel into three non overlapping periods: 1920-1923, 1924-1926 and 1927-1929, averaging the price level in each county in each period. Over each period, we also compute the sum of bank suspensions, and divide this sum by the value of deposits at the beginning of the period. Time and state fixed effects are included, and standard errors are clustered across both state and time. Column 2 uses the log price of land observed in the 1930 cross-section from the US Census as the dependent variable. The suspension variables are the sum of suspended deposits over the period 1920-1929 at the relevant geographic unit, divided by deposits in 1920. State fixed effects along with the log price level in 1920 are also included and standard errors are clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1.

Table 7. Transactions and Bank Suspensions

	(1) properties transacted	(2) Acres transacted
Properties transacted, log, previous period	0.670***	
	(0.0720)	
ratio of suspended deposits in county to total deposits in county, previous period	-0.490*	-0.496
	(0.278)	(0.402)
In-state,50 miles, ratio of suspended deposits in counties to total deposits in counties, previous period	-3.482***	-2.837***
	(0.192)	(0.880)
In-state,50-100 miles, ratio of suspended deposits in counties to total deposits, previous period	1.179	0.759
	(1.838)	(0.972)
Out-of-state,50 miles, ratio of suspended deposits in counties to total deposits, previous period	0.384	0.523
	(0.639)	(0.677)
Acres transacted, log, previous period		0.608***
		(0.0851)
Observations	378	377
R-squared	0.783	0.786

The dependent variable in column 1 is the log number of properties transacted in an annual panel of counties located within 100 miles of a state border. The dependent variable in column 2 is the log number of acres transacted in an annual panel of counties, again located within 100 miles of a state border. In both columns, the panel is based on three non overlapping periods: 1920-1923, 1924-1926 and 1927-1929, taking the sum of the dependent variable in each county in each period. Over each period, we also compute the sum of bank suspensions, and divide this sum by the value of deposits at the beginning of the period, over the relevant distance increment. Time and state fixed effects are included, and standard errors are clustered across both state and time. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 8. Bank Failures and Contagion

	(1) bank suspensions
ratio of suspended deposits in county to total deposits in county, previous year	0.0621***
	(0.0130)
In-state,50 miles, ratio of suspended deposits in counties to total deposits in counties, previous year	0.130***
	(0.0434)
In-state,50-100 miles, ratio of suspended deposits in counties to total deposits in counties, previous year	0.121**
	(0.0586)
Out-of-state,50 miles, ratio of suspended deposits in counties to total deposits in counties, previous year	0.0241
	(0.0157)
Observations	11,839
R-squared	0.080

The dependent variable in column 1 is the ratio of suspended deposits in a county, defined as the total value of suspended deposits in a county divided by total deposits the previous year. The data are observed annually from 1920-1929 for an unbalanced panel of 2600 counties located within 100 miles of a state border. State and year fixed effects are included. *** p<0.01, ** p<0.05, * p<0.1.

Table 9. Recovery Rates and Relative Outside Financing Capacity in 1920

VARIABLES	(1)
bank (deposits) suspension rate over failure horizon	-0.155***
	(0.0352)
assets scaled by deposits in county net of own deposits, log	-0.144*
	(0.0782)
assets scaled by deposits in in-state counties up to 50 miles, log	-0.0131***
	(0.00334)
assets scaled by deposits in in-state counties 50-100 miles, log	-0.196
	(0.155)
assets scaled by deposits in out-of-state counties up to 50 miles, log	-0.00215**
	(0.000973)
Observations	238
R-squared	0.542

The dependent variable is the three year recovery rate. Controls inlcude the bank and county level variables from Table 3, column 3, as well as state fixed effects. Standard errors are clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1.