"Loans For the Little Fellow:" Credit, Crisis, and Recovery in the Great Depression*

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Abstract

Credit has large and lingering effects on the health of the economy, especially during financial crises. This paper uses newly-collected data from the Great Depression to document the causal and persistent effect of credit supply on economic activity through a structural transformation channel. The Bank of America did not select into better-performing cities in California before 1929, but cut lending from 1929 to 1934 by 50 percent less than the median California bank. Cities with Bank of America branches in 1929 had smaller contractions and stronger recoveries due to this lending stability. Linked individual data demonstrate local credit supply affected household demand during the financial crisis, leading to increased wages as workers moved from agricultural to retail and service employment. Nontradable occupations were higher-skilled, creating a barrier to convergence for more credit-scarce areas even in 1940.

Keywords: Great Depression, credit supply, branch banking, structural transformation
JEL classification: N22, G01, G21, R11, R23, E44, E51

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1 Introduction

From 2007 to 2009, real GDP fell by 4 percent in the United States. Even when the economy began to expand again, growth remained unusually weak. This sort of severe contraction and slow recovery in output is typical of financial crises. Due to the large welfare costs associated with these crises, a robust literature has studied the effects of credit booms on economic activity.[1] In contrast, little is known about the effect of the credit contraction on the recovery from a financial crisis. Furthermore, existing work primarily focuses on the effect of lending on household and firm spending, leaving open the question of how credit shocks to the local economy propagate through labor market reallocation.

Credit busts may be a product of pre-crisis conditions, or a reaction to the current state of the economy, introducing a host of empirical issues. To address these problems, I employ a new identification strategy to measure the causal effect of credit supply shocks on the economy's contraction and recovery and provide evidence on the importance of labor market adjustments during the Great Depression. First, I use a newly-constructed dataset to measure the dynamic response of local economic activity to a plausibly exogenous decline in credit supply which is unrelated to both the preceding lending boom and contemporaneous economic conditions. Even after the financial sector recovered, I establish that the real effects of crisis credit persisted. Second, using linked worker-level microdata, I isolate the channel through which labor markets mediate credit supply shocks to the real economy.

My empirical strategy takes advantage of the expansion of Bank of America branches in late 1920s California. At the time, most banks were confined to operate in only one

[1] The literature on the effect of credit growth on economic growth is vast. Claessens et al. (2012); Jordà et al. (2013); Romer and Romer (2017); Cerra and Saxena (2008), and Krishnamurthy and Muir (2017) document stylized facts about economic growth around financial crises. Schularick and Taylor (2012) and Reinhart and Rogoff (2009) demonstrate how credit booms are likely to lead to financial crises and deep recessions. For details on the credit boom in the 2000s in particular, and its effects on the economy before and during the financial crisis, see Mian and Sufi (2014) and Di Maggio and Kermani (2017). A newer strand of the literature separately assesses the effect of small business (e.g. Huber (2018), Chodorow-Reich (2014), Greenstone et al. (Forthcoming), Giroud and Mueller (2017) and Chen et al. (2017)) and consumer (Mondragon, 2018; Garcıa, 2017) credit cuts on economic activity and overall employment. Two papers written before the Great Recession, by Peek and Rosengren (2000) and Ashcraft (2005) disagree on whether lending cuts affect the real economy.

city, leaving them wholly exposed to local shocks and with little access to external liquidity once interbank markets froze. In the 1930s, such banks were forced to cut lending to keep enough assets on hand in the case of a bank run. The Bank of America was the only bank in the country to operate in multiple metropolitan areas. As a result, it was sufficiently large and geographically-diversified to weather the financial crisis and promote small business and household loans to its customers in an effort to get, as its advertising slogan went, "back to good times" (Bonadio, 1994). I show that, in 1929, cities with Bank of America branches were indistinguishable from non-branched places in California, the state in which it operated, based on observables and pre-1929 economic growth, resolving the key identification challenge of crisis credit busts. From 1929 to 1933, the Bank of America cut lending by only 30 percent, which was half the size of the average California unit bank's loan contraction. Employing the quasi-random allocation of this bank lending shock, I compare the evolution of economic activity in cities in the 1930s based on whether or not they had a Bank of America branch, and therefore more stable credit, at the onset of the Great Depression. Then, I use the linked worker dataset to measure changes in city labor markets as a function of crisis credit availability. Together, these results illustrate how a period of financial instability has lingering effects on economic activity.

I identify a credit supply shock using this institutional variation. The vast majority of the literature linking credit to the real economy relies on changes in the quantity of lending, which has led to substantial debate on whether credit expansions are a product of changes in credit supply or credit demand.[2] Other recent work has identified several quasi-experimental shocks to either households or firms, but because of the historical context, I have longitudinal data for all workers in the economy, which allows me to link the change in credit supply to economic activity, household demand, and changes in industrial and occupational employment. I show that credit supply shocks restructure the economy through

[2]This discussion centers on whether the run-up in mortgage lending before the Great Recession is a function of a change in bank lending policy, e.g. Mian and Sufi (2014), or the response of credit demand to other macroeconomic variables such as housing wealth (Foote et al., 2012; Adelino et al., 2016).

the household demand channel, as conjectured by Mian and Sufi (2018) due to the link between location-specific credit, household consumption, and the concentration of skilled occupations in nontradable industries.

In order to measure the effect of credit shocks on the real economy, I have assembled a new panel of city-level banking and economic activity data from a variety of archival sources. Research shows that differences in credit access have large effects even across small distances, making it crucial to measure economic activity at a disaggregated level (Nguyen, 2019; Petersen and Rajan, 2002). To measure local economic activity at a fine enough level of spatial disaggregation, I hand-collected annual city-level real estate values and population for all California cities over 20 years from the California Board of Equalization (various years). I measure changes in credit at the city level using both bank balance sheets and, in a new approach, branch-level deposit data published in court hearings and congressional testimony (Transamerica Corporation vs Federal Reserve Board, 1953; 71st Congress, 1931). Finally, I match the same individuals over time using the 1930 and 1940 full count US censuses and automated linking methods in order to examine labor market transitions in both rural and urban places while controlling for other factors in worker outcomes at the locality and individual level (Ruggles et al., 2017; Abramitzky et al., 2012). I use this unique dataset to analyze the effects of the relative credit stability enjoyed by Bank of America cities during the financial crisis of the early 1930s.

I show that credit busts have large and persistent effects on the economy in a series of local projections. Cities with Bank of America branches had ten percent smaller declines in economic activity during the crisis itself. By 1940, Bank of America-branched cities had grown by 25 percent over the course of the preceding decade, while non-branched cities struggled to reach 1929 levels of activity. Because local projections identify the dynamic effects of a shock, as demonstrated in Jordà (2005), I am able to decompose the response of economic activity to credit supply year by year, revealing the source of the divergence. The large difference in economic activity in 1940 has its roots in the start of the recovery. The small differences in the size of the contraction compounded immediately, as economic activity rebounded above pre-crisis levels in 1934 in credit-rich areas and stagnated elsewhere. This divergence comes from crisis-era credit conditions; like the cities which never had a Bank of America branch in this period, locations in which Bank of America opened a branch after 1933 had zero economic growth between 1929 and 1940. In a variety of robustness checks, I rule out competing explanations, such as financial development, branch selection on observables, and New Deal spending. To understand how credit during a financial crisis can create such large, lasting differences in economic activity, I turn to individual-level data covering the labor market during the 1930s.

Labor markets transformed in the face of these differential credit shocks. I compare workers' outcomes based on their exposure to the aggregate credit shock during the 1930s, controlling for pre-crisis characteristics. Levels of unemployment and labor force participation were no different in credit-rich places and credit-scarce places, confirming that even non-branched places had recovered from the Depression by 1940. However, workers in Bank of America-branched places had moved farther the occupational ladder than their non-branched equivalents, and as a result, were earning higher wages. These differences are driven by reallocation of labor away from agriculture and into retail and services. All of these sectors depended on banks for financing, further corroborating that these results are due to changes in credit supply, not credit demand. The decline in the willingness of banks to lend caused large differences in economic outcomes through persistent differences in nontradable employment.

Cities reallocated workers into sectors with very different skill levels based on relative credit availability. In response to a smaller fall in lending, cities with Bank of America branches increased employment in higher-skilled occupations, which were concentrated in the nontradable sector, especially relative to the agricultural sector. The difference in skill level was a barrier to convergence for workers living in credit-scarce areas, even though total employment rebounded. The impact of local demand during the financial crisis, therefore, had effects on wages and occupational upgrading which continued into the recovery. This structural transformation, and its prolonged effect on economic activity, is hard to measure in less granular datasets. Using data on both occupation and industry at the worker level, I confirm results on changes in aggregate nontradable employment due to consumer credit changes by Mondragon (2018) and Garcıa (2017) while providing an explanation for the persistence of credit shocks and controlling for a variety of local and individual-level characteristics. In this sense, I complement Huber (2018) and Chen et al. (2017), who find that firms' difficulty in borrowing during the Great Recession translated into slow county-level growth due to declines in innovation activity and reallocation to costly non-bank credit, respectively. Analysis from the worker side of the labor market illustrates an additional channel for credit to affect the economy during a financial crisis and verify that the patterns seen in the Great Recession occurred before, in another context.

Unlike earlier studies of the role of credit in the Great Depression, my estimation strategy takes advantage of a nationally representative set of industries and expands the window of analysis to cover the recovery, clarifying the effects of credit on the economy in the 1930s. At the time, California's economy almost exactly duplicated the national distribution of employment across industries, increasing the external validity of my state-wide results. (Department of Education, 1937). Previous work focuses on bank failures in either large, industrialized cities in the Northeast and Midwest or the rural South.[3] In particular, I find evidence that the decline in banks' willingness to lend led to a contraction in bank credit availability, one aspect of the money supply contraction described by Friedman and Schwartz (1963). This decline in financial intermediation during the crisis also prolonged the recession. I find persistent differences in local economic activity until 1940, complementing the empirical test of Bernanke (1983) done by Calomiris and Mason (2003) on state and county responses to contemporaneous lending cuts from 1929 to 1933.

Finally, this study demonstrates the importance of branch banking for stability during

[3]See Benmelech et al. (2019) and Lee and Mezzanotti (2017) for the former and Ziebarth (2013) and Richardson and Troost (2009) for the latter.

financial crises. Starting with Jayaratne and Strahan (1997), research has demonstrated that states which relax branch banking restrictions grow faster during periods of economic expansion, which are often periods of high credit growth (Mian et al., 2019). I illustrate that the first large-scale branch banking network insulated local communities during the 1930s because its reduced risk exposure led to relatively high levels of credit supply during the banking crisis. Contemporary policymakers saw the resilience of Bank of America as an indictment of the American unit bank system, which was unique among advanced economies. In related work, Carlson and Mitchener (2009) find that bank failures were less likely in cities with Bank of America branches as unit banks shored up their asset portfolio to remain competitive. Despite regulators' skepticism about the safety of branch banking, my results indicate that branching led to increased credit availability, and therefore significant differences in economic activity during the Great Depression.

In the next section, I provide background on this bank and historical setting. In section 3, I detail the data sources and identification strategy used in this paper. Section 4 illustrates the effect of a credit supply shock on city-level economic activity in the 1930s. Then, to explain these results, I use linked worker microdata on labor markets in Section 5. Section 6 concludes.

2 Historical Context

2.1 Bank Branching in California

During the Great Depression, California's economy plunged, but its financial sector remained relatively strong. The state suffered a 45 percent contraction in per capita personal income from 1929 to 1933, matching the national average. However, California's banking sector did not mirror the decline in the rest of the country. Only three percent of California's 1929 deposits were in banks that failed during the crisis, as compared to 12 percent in the rest of the nation. Total bank credit fell 34 percent in California from 1929 to 1934, as compared to 50 percent in the rest of the United States. Contemporary explanations for this difference centered on the uniqueness of California's banking system.

At the time, it was the only state with widespread branch banking.[4] One bank, the Bank of America, had over half of the branches active in California in 1929.[5] Rivals called it a "huge financial octopus" with 467 total branches in 232 towns in 1929, stretching all over the state (71st Congress, 1931). Its branches outside of San Francisco and Los Angeles constituted 40 percent of the total branches operating outside of banks' headquarter cities in the nation. Figure 1 plots the number of cities served by the Bank of America and the next three largest bank branching systems in California from 1922 to 1939. Other banks expanded more rapidly in the early 1920s, but did not keep pace with the Bank of America after 1925. From 1926 to 1929, the Bank of America opened branches in 110 new cities. Expansion paused during the early 1930s. However, from 1935 to 1937, the Bank of America acquired a presence in 40 additional cities.[6]

Unlike the Bank of America, the three next largest branching banks operated in at most two parts of the state (e.g. San Diego and Los Angeles), and never in both northern and southern California. Figure 2a maps the cities of California; circles mark places home to at least one Bank of America branch in 1929 and triangles are cities without any Bank of America branches in 1929.[7] The darker the color, the larger the population in 1929. Particularly in the Central Valley, the agricultural region running down the middle of the

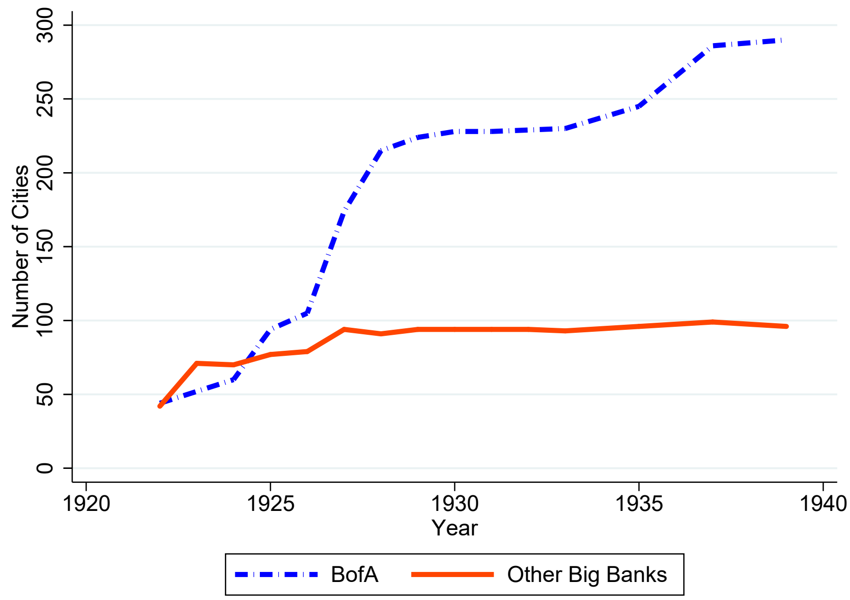
[4]The McFadden Act in 1927 permitted national banks to branch according the statutes in their state of operation, so both national and state banks were subject to the same branching rules in each state. Although other states permitted bank branching, California was the only one with take-up of multi-city branching. At this time, branching across state lines was nationally prohibited.

[5]The bank known now as Bank of America started as the Bank of Italy in 1904. It changed names several times in the 1920s, and became the Bank of America National Trust and Savings Association in 1930. For the sake of expositional convenience, I will refer to the components of the Bank of America National Trust and Savings Association as the Bank of America throughout.

[6]Once the banking sector stabilized in 1934, regulators in Washington, DC permitted the Bank of America to resume branching. In 1937, the US Treasury deemed the bank's dividends too large, and halted the bank's expansion (James and James, 1954).

[7]In total, there are 303 incorporated cities in the state in 1929. I use town and city interchangeably because state law does not distinguish between them. The smallest incorporated city in California in 1929, Tehama, had 204 people. Additionally, there are 179 unincorporated towns with banks and 294 inhabited places in 1929. Unless otherwise noted, I use city and town to refer to both incorporated and unincorporated inhabited places to simplify the exposition.

Figure 1: The Size of California Branch Bank Networks, 1922–1939



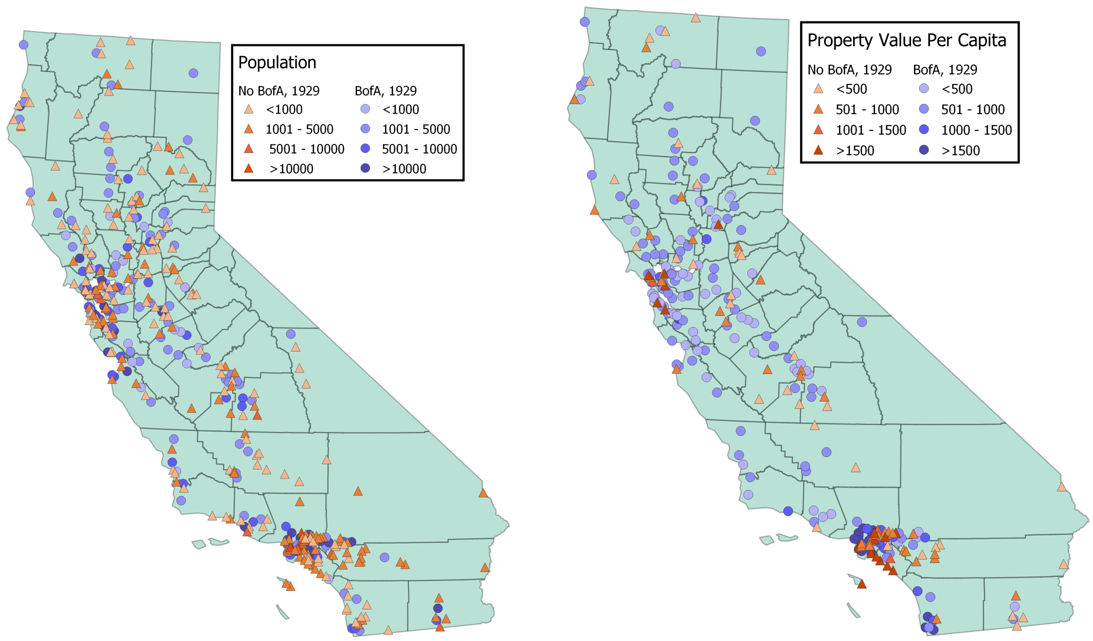
Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), and author's calculations. The other big banks are the only other banks to operate branches in more than four cities in 1929: Security Trust, California Bank, and American Trust Company.

state, cities with similar population levels and location levels had different levels of exposure to Bank of America at the start of the Depression. There is no clear geographic pattern to the bank's locations. Its leaders set a goal of putting a branch in every city in the state, regardless of size or remoteness, and it is clear that they made progress towards that goal, despite steep regulatory opposition.

California branching rules in the 1920s and 1930s occupied a middle ground between the strict prohibition in other states at the time and the modern branching model. Due to state banking policy, bank branching expansion occurred through purchasing and converting existing banks, not establishing new branches. In order to open a branch in a city outside its headquarters, the expanding bank first had to purchase a bank in that city. Once a bank was acquired, regulators had to approve it as a branching office.[8] *De novo*, or brand-new, branch

[8]Unfortunately, Bank of America's branch permit applications cannot be located by archivists at the California State Archive. Statistics on permit acceptance rates do not exist either, but a comparison of a former superintendent's memoirs and the state banking department's annual report indicate that even the

Figure 2: 1929 City Characteristics



(a) Population (b) Property value per capita

Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), Minnesota Population Center (2016), California Board of Equalization (various years), Durham (1998), and author's calculations. Triangles are cities without a Bank of America branch in 1929 and circles are cities with at least one Bank of America branch in 1929. The darker the symbol, the larger the level of population or economic activity. Economic activity is only available for incorporated cities. Population includes all settled places in California in 1929.

offices outside the bank's headquarter city, were only allowed in special cases such as a town without any banking services. In either case, branching permits were only issued under the aegis of "public convenience and advantage." Because there was no consistent definition of this criterion, branching permit issuance was an uncertain business unless the branch was in the same city as bank headquarters.

Regulators' attitude towards geographic diversification in general and the Bank of Amer-

most generous superintendent granted under one-third of applications (Wood, n.d.). State banking records do not indicate the process by which they chose which branches to approve. Will C. Wood, the former superintendent, recollected only that he visited Los Angeles and San Francisco to see several locations in person but gave no reasons for his decisions on permits in other areas (Wood, n.d.). In court testimony, Bank of America executives recalled writing letters or visiting unit banks every month for ten years before the bankers acquiesced to selling their bank to the Bank of America, suggesting substantial uncertainty even before the permit process (Transamerica Corporation vs Federal Reserve Board, 1953).

ica more specifically, therefore were of paramount importance. To the alarm of the unit bank-dominated banking agencies, branch networks relied on acquisition, so branch expansion directly decreased unit banks' market share by construction. The Bank of America, which was the only bank in the nation attempting widespread branch banking, attracted the bulk of regulators' dislike. Bureaucrats in the California banking department were particularly intransigent; in a 1926 lawsuit to overturn the *de novo* rule, the Bank of America alleged that regulators rejected any Bank of America permit where another big bank wanted to open a branch (Dana, 1947). In the late 1920s, the state superintendent of banks wrote that "positively all of [his employees] were prejudiced against the Bank of [America]" (Wood, n.d.). Throughout the 1920s, the Bank of America's statewide expansion was hampered by regulatory skepticism about its plans to open branches all over the state. Despite it being legal, the very idea of branch banking was considered dangerously un-American by most state and national regulators, particularly branching across multiple cities (James and James, 1954). These aspects of the branch opening process imposed significant checks on Bank of America's ability to choose where to expand. In Section 3.4, I demonstrate that the push and pull between the bank and its regulators led to no significant differences in observables between cities with and without Bank of America branches during the 1920s, allowing me to take the bank's location as quasi-random.

2.2 Lending in the Great Depression

By converting banks into branches in cities all over California, the Bank of America could amass deposits from dozens of towns with very different seasonal money demand. With such a large deposit base, the bank was able to lend widely. The *American Banker* noted that the Bank of America "never deviate[d] and it never [gave] up" on trying to lend as much as possible, like a tobacco company selling cigarettes (quoted in James and James (1954)). Officers at the bank's headquarters in San Francisco monitored branch loan officers, most of whom were holdovers from when the branch was a unit bank, closely; if a disproportionate number of loans were going to the local elite, the bank's founder, A.P. Giannini, was likely to show up unannounced to question why the branch manager had refused to grant loans (James and James, 1954).[9] A contemporary remarked that the Bank of America "kicked the top hat off of California banking," by lending to people outside of the elite group which had traditionally attracted credit (quoted in Posner (1956)).[10] These lending habits, though established in the 1920s, differentiated Bank of America from other California banks during the 1930s.

In comparison to other California banks, the Bank of America remained willing to lend during the 1930s. Figure 3d illustrates that in contrast to loan-deposit ratios before 1929, which were parallel, the Bank of America's loan-deposit ratio remained stable at 0.64 from 1929 to 1933. At the same time, the average for the rest of the state which fell from 0.70 in 1929 to 0.54 in 1933. Deposits remained stable throughout the state, due to the paucity of bank failures, as can be seen in Figure 3b. The Bank of America responded to the national financial crisis, and changes in the level of deposits, by cutting lending by less than California unit banks, as plotted in Figure 3a.[11]

When the 20 largest cities in the state are excluded, Bank of America's lending policy is even more striking. On average, all other California cities experienced a decline in unit bank lending from 1929 to 1934 of 60 percent, roughly twice the Bank of America decline.[12] The distribution of the change in city-level unit bank lending is displayed in Figure 4a. Many

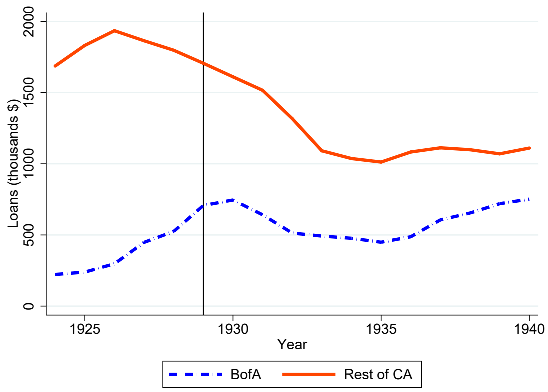
[9] Unlike Berger and Udell (2002), the Bank of America kept acquired unit banks' soft information in the system, minimizing losses in loan evaluation quality as the branch network grew.

[10] Anecdotal evidence indicates that the Bank of America did continue to lend to a broad swathe of society, which would indicate that Bank of America's presence could affect credit availability for both rich and poor people. For example, the chairman of the Reconstruction Finance Corporation, Jesse Jones, lauded Giannini for its cooperation with the RFC in small business lendiing during the 1930s (James and James, 1954). Without loan-level data, I cannot distinguish if the Bank of America experienced less of a flight to quality in lending than other California banks during the Great Depression.

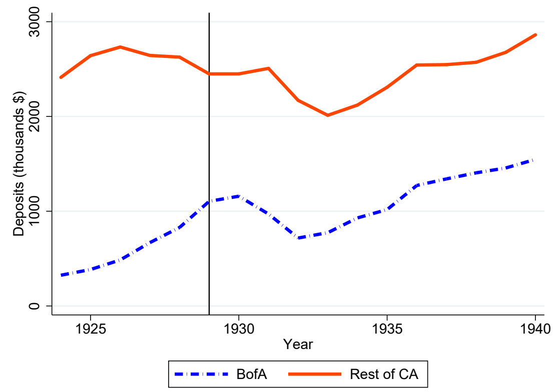
[11] The steep increase in Bank of America's lending and deposits before 1929 relative to the rest of the state is a function of unit banks ceasing independent operation and becoming branches of Bank of America. The loan-deposit ratio line controls for this category switch and demonstrates that before 1929, there is no differential credit shock before 1929, but during the early 1930s, the Bank of America cut lending by substantially less.

[12] As discussed in the next section, I drop the 20 largest cities by population in 1929 from the analysis whenever possible. Figures 3a through 3d use California aggregates, so they still include banks in those large cities.

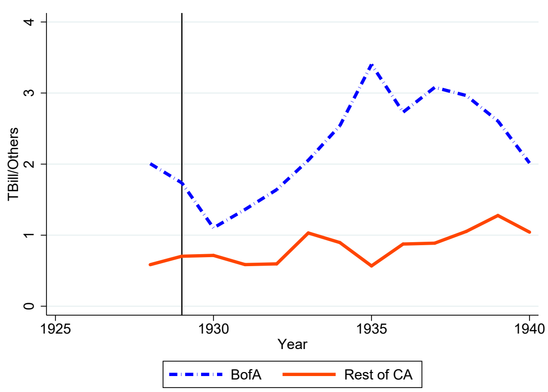
Figure 3: Loans, Deposits, and Investments, 1924–1940



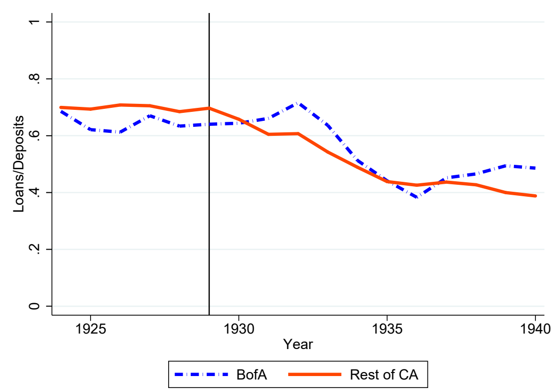
(a) Outstanding Loans



(b) Total Deposits



(c) US Treasuries-Other Securities Ratio

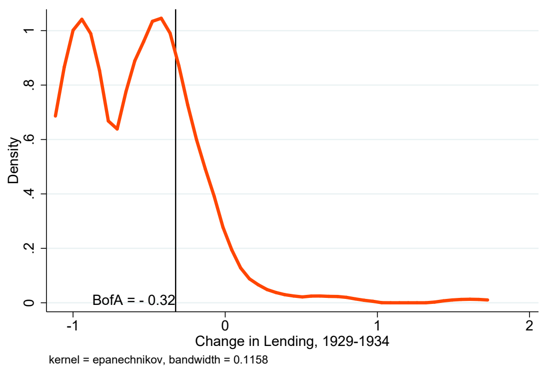


(d) Loan-Deposit Ratios

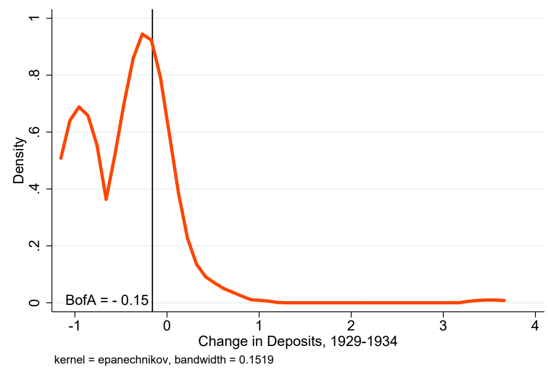
Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), and author's calculations. The BofA line plots Bank of America's total in each year while the Rest of CA line is the aggregate for each variable for all other banks operating in California in each year.

cities experienced credit losses near 100 percent. These lending declines were not wholly driven by bank failures. Figure 4b plots the deposit equivalent to Figure 4a. There is some mass near -1, indicating unit bank deposits in that city fell to 0 in 1934. However, Bank of America's change in deposits was approximately equal to the median city change in deposits, indicating that banks across California contracted lending by far more than their deposit losses would have indicated. The Bank of America also expanded lending faster after the crisis relative to other banks, but in robustness checks, I show that it is the difference in credit supply from 1929 to 1933, not the expansion during the recovery which drives my

Figure 4: The Distribution of Changes in Unit Bank Activity, 1929–1934



(a) Outstanding Loans



(b) Total Deposits

Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), and author's calculations. For each city, I totaled up the number of unit bank loans in deposits in both 1929 and 1934 using bank balance sheets. Each observation is the change in either lending or deposits done by unit banks for a given city between 1929 and 1934. The black vertical line marks the change made by the Bank of America in the same period at the bank level. The 20 largest cities in 1929 in California by population are excluded.

results.

Other California banks were substantially more exposed to local economic shocks without the geographic diversification of branching when banking panics caused tightening in the interbank lending market. (Mitchener and Richardson, 2019).[13] When the Bank of America's San Francisco headquarters got wind of a potential bank run in Sacramento in 1933, for example, they chartered an airplane and several limousines to transport $13 million in gold to the main Sacramento branch, preventing a panic (Dana, 1947). Other banks were forced to hold more assets as cash, instead of loans, in the fear of bank runs. Bank branches had lower fixed costs, so the Bank of America could invest in Treasury bonds, instead of riskier securities and still break even (Carlson and Mitchener, 2009). Figure 3c demonstrates that the Bank of America had a substantially higher ratio of US Treasury bond holdings to all other security holdings for Bank of America than other California banks. In the face of

[13] A 1936 analysis of all state bank failures between 1929 and 1933 by the California State Banking Department found that the two most important reasons for bank suspensions were local depression and cash withdrawals. Without the interbank lending market, unit banks were particularly susceptible to these local shocks and bank runs (California State Banking Department, various years). Interbank deposits in California fell 28 percent from 1929 to 1933 (Board of Governors of the Federal Reserve System, 1928).

higher risk exposure, unit banks deviated significantly more from pre-crisis lending policies than the Bank of America.

3 Data and Empirical Strategy

This paper's identification rests on the comparison of cities with and without access to Bank of America's relatively generous bank lending policies during the Great Depression. Assessing the validity and impact of this exogenous credit supply shock requires information on each city's banking and economic environment during the branch expansion period of the 1920s and the Depression of the 1930s. Therefore, I have assembled a panel of city-level financial and economic data from a variety of archival sources. In addition, I have constructed a linked worker-level dataset using the 1930 and 1940 censuses to decompose the mechanisms behind my city-level results. Except where otherwise noted, these data were hand-collected. More detailed information on the construction of this dataset can be found in the data appendix.

3.1 Banking

To understand cities' banking markets, I aggregate annual balance sheets for every bank in California during this period up to the city level. Expanding on data originally collected by Carlson and Mitchener (2009), I use bank-level variables from California State Banking Department (various years) and Office of the Comptroller of the Currency (various years), starting with the opening of the Bank of America in 1904 and ending in 1940. These reports record the opening and closing dates of banks and branches in all California cities every year as well as every bank's overall balance sheet every year.[14] I am therefore able to measure cities' exposure to Bank of America in every year. Cities appear to be the correct contemporary banking market definition in this case; Federal Reserve and California bank

[14] Although the California Superintendent of Banks recognized that the spread of branch banking made bank-level reports inaccurate for local conditions at the time, they did not rectify the situation. For example, Bank of America operated in over 200 cities but since its headquarters were in San Francisco, all branches' loans and deposits are part of the San Francisco county totals in commonly-used sources.

superintendent comments on Bank of America's branching applications indicate that they considered each city to be its own banking market in this period (Delano, 1945; Wood, n.d.).[15]

In addition to these standard banking sources, I also digitized branch-level deposit data from a new source. The Federal Reserve brought anti-trust charges against Transamerica Corporation, the bank holding company then associated with the Bank of America, in 1946. Lawyers presented city-level biennial deposit market share data as evidence of the Bank of America's monopoly power in archival court records. I transcribed these deposit data for all cities in California from the court exhibits (Transamerica Corporation vs Federal Reserve Board, 1953). Deposit share has been used as a measure of bank market presence in the modern banking literature (e.g. Chen et al. (2017)) but this court case provides a unique historical window into city-level banking markets.

Despite the legality of branch banking in California, most banks were small unit banks. Only ten percent of the 400 banks operating in 1929 had any branches at all. No bank other than the Bank of America operated in more than 45 cities. Table 1 presents a breakdown of cities by whether or not they had access to Bank of America or any other bank office.[16] Of the cities without a Bank of America branch in 1929, 56 had no banks at all, while 212 cities had some other type of bank. Just over 15 percent of cities only had Bank of America branches. The remaining 27 percent had both Bank of America and another bank operating at the onset of the Great Depression.

In the 1920s, there was not much difference between the average California bank and the Bank of America in terms of lending relative to deposits, as seen in Figure 3d. However,

[15]In both cases, records indicate that regulators would accept or deny branch applications based on banking facilities only within that city. While many studies demarcate banking markets at the county level (e.g. Jaremski and Wheelock (2018)), this does not appear to be accurate in this context, perhaps because California rural populations tended to cluster in populous farm towns (McWilliams, 1999). For this definition to be incorrect, lenders would have to issue more credit to borrowers outside their city than inside it. In effect, this is a no-defiers assumption about relationship lending. In Section 5, I provide evidence for this assumption with geocoded individual-level data.

[16]These counts include both incorporated and unincorporated cities. As discussed in the economic activity section below, California had over 200 unincorporated cities during the 1920s and 1930s.

Table 1: California Cities by Type of Banking Office, 1929

	No Other Offices	Other Offices	Total
No BofA Branches	56	212	268
BofA Branches	79	133	212
Total	135	345	480

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), and author's calculations. Other offices include all branches not operated by the Bank of America and unit banks in California. This table includes both incorporated and unincorporated places, as defined in the 1930 Census, except those dropped throughout the body of the paper.

when the nation plunged into financial crisis, several key aspects of the Bank of America balance sheet allowed it to continue making credit available. Its scale was vastly larger than its competitors, particularly those banks operating outside of San Francisco and Los Angeles. First, only the Bank of America was geographically diversified across the state. No other bank operated in multiple regions of the state. Its competitors were unable to hedge against negative local demand shocks due to the limited (if any) scope of their branching networks. Second, it was by far the largest bank in the state, so it was more insulated in a tightening market. Table 2 lists profits, loans, deposits, assets, number of cities served, and the ratio of Treasury bonds to other securities for the fifteen largest banks in the state, along with the state average excluding the Bank of America. In 1929, the Bank of America had almost four times the assets of the next largest bank in the state and 200 times the state average. Its larger scope helped mitigate fixed costs, which gave it more breathing space.[17] Even in June 1929, the average California bank reported zero profits. Third, it had less exposure to private securities than other banks due to its Treasury bond holdings. Due to these risk-mitigating factors, the Bank of America cut its lending by 30 percent from 1929 to 1934. In the same period, California unit banks cut lending by 60 percent on average. These banks suffered large deposit losses as customers took their accounts to banks they perceived as safer. On average, Bank of America increased its deposit market share by 10 percent from 1928 to

[17] See Carlson and Mitchener (2009) for details on how branching was more cost-effective than unit banking.

1933 in each city in which it operated. Having a Bank of America branch, therefore, granted cities access to a much larger and more-diversified bank than the alternative.

Table 2: The Ten Largest California Banks in 1929

Bank	*Assets*	*Loans*	*Deposits*	*Profits*	*Investment Ratio*	*Cities Served*
Bank of America	1,198	674	989	3	1.684	232
Security Trust	350	202	308	0	1.353	44
American Trust	282	166	226	1	0.944	35
Anglo National	152	87	117	0	0.953	1
Wells Fargo	143	86	110	3	0.670	1
Citizens National	141	76	117	0	0.871	1
San Francisco	125	69	119	0	0.405	1
Bank of California	114	73	88	0	0.493	1
California Bank	112	71	91	2	0.382	18
Crocker First	90	47	69	0	2.944	1
Hibernia	84	47	76	0	0.528	1
Anglo Californian	77	49	67	1	0.379	1
Farmers National	70	45	60	0	5.696	1
Oakland	65	41	54	1	0.379	1
Central Savings	37	25	31	1	1.700	1
State Avg.	6	4	5	0	0.342	1.322

Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), and author's calculations. Calculations include all 428 state and national banks in California in 1929. Balance sheet totals are in millions of dollars. Investment ratio refers to the ratio of US securities to other securities on each bank's balance sheet. Cities served is defined as the number of cities in which the bank has branches, including the bank's headquarters. This table does not drop the 20 largest cities in California in 1929. State average includes all banks besides Bank of America.

3.2 Economic Activity

I complement these banking data with other city economic variables. It is important to measure economic outcomes on the city level because at the time, all banking was relationship-based, so close proximity was key for credit access.[18] Because I am interested in the dynamic effects of credit supply, I assembled a panel of all incorporated cities from 1923 to 1940 from archival reports authored by the California Board of Equalization. I digitized nominal total property values as of March 1 in each year for all California cities from 1923 to 1940.[19] These property values are the total dollar value of all commercial, agricultural and residential assets, including land, structures, and capital, held by all individuals and non-financial firms in a given city in a given year. The state government strove to make these assessments as accurate as possible because they were the basis for school funding in this period. I supplement this information with annual city population estimates from Bleemer (2016) over the same period. In each year, roughly 250 cities, split equally across Bank of America branch status, report property values, but due to the amount of population churn at the time, cities enter and leave the dataset as they get annexed or unincorporate, making it an unbalanced panel. Because I cannot directly observe the effects of these annexations, I divide total property value in a city by its population every year to control for changes in city boundaries. Figure 5 plots the average total property value per capita for cities with and without Bank of America branches in 1929. Both types of cities experienced growth during the 1920s, peaking in 1929, followed by a decline during the 1930s.

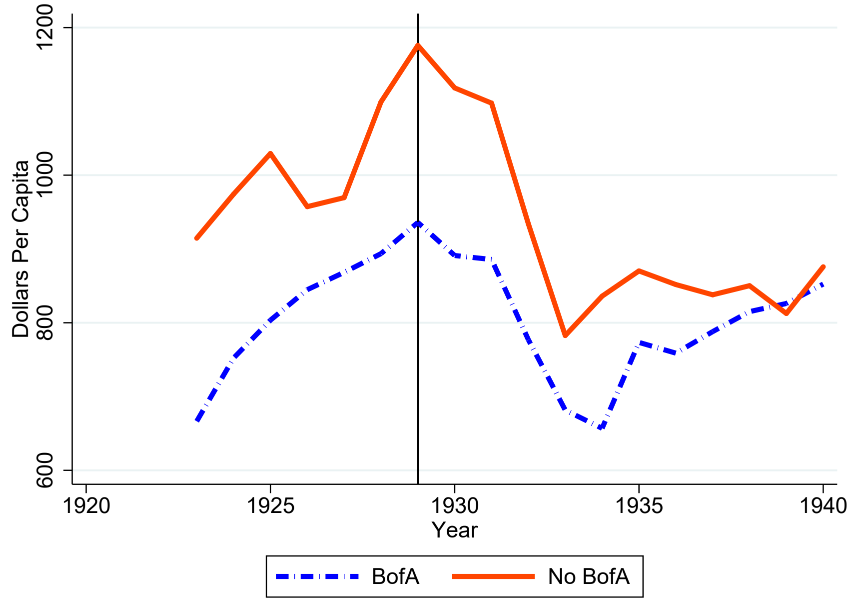
Unlike many other Great Depression-era studies, I measure outcomes for both rural and urban places, allowing for a more complete accounting of the real economic effects of banking crises. Unincorporated communities were sizable in California, and were home to 40 Bank of America branches in 1929.[20] For rural places, I use the enumeration district, which is

[18] This was particularly true of the Bank of America. According to the bank's handbook, "character [was] the best basis of all for credit," indicating an organizational emphasis on soft information (Bank of America, 1942).

[19] For more detail on property value sources and definitions, see the data appendix.

[20] According to a contemporary survey done by the California State Chamber of Commerce, 56 unincorpo-

Figure 5: Average Private Property Value Per Capita Based on 1929 Branch Locations



Sources: California Board of Equalization (various years), Bleemer (2016), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), and author's calculations. Property value includes all non-financial and personal assets, including land, structures, factory equipment, and investments.

the historical census decade-specific equivalent to a census tract. I convert enumeration districts into a standardized unit of observation across the 1920, 1930, and 1940 censuses using definitions scraped from Morse et al. (n.d.). With these definitions in hand, I measure non-financial characteristics for the entirety of the state.

Appendix Table 32 and Appendix Table 31 summarize the occupation employment shares and demographics on the city level in 1930. The average city had a population of 3,082 in 1930, with approximately 3 in 8 people employed. The workforce was evenly divided into skilled, agricultural, professional, sales and unskilled work in 1930. Between ten and 15

rated towns had populations of over 1,000 people in 1927. Unincorporated communities ranged in size from 100 to 66,800 people (State Chamber of Commerce, 1928). To account for these communities, I digitized the "unincorporated place" field of each 1930 census form which was not in an incorporated city. This yielded geocodable cities for 8,439 enumeration sheets out of 30,388 candidates. The 1930 enumerator instructions indicate that unincorporated towns with populations over 500 must be enumerated separately from rural areas. Based on my data collection, California enumerators often enumerated places with populations under 500 apart from the rest of the (rural) enumeration district. The remainder of these sheets cover people living outside of a populated place. Further information on this process is available in the data appendix.

percent of employment was in each of manufacturing, agriculture, services, and retail trade.[21] Smaller sectors included mining and government work. Manufacturing establishments were balanced in 1929 in terms of incorporation status, log wages, and log earnings, as displayed in Appendix Table 9, though sales were smaller. For a more detailed discussion of the balance of these characteristics across Bank of America status over time, see the appendix.

3.3 Labor Markets

In order to measure changes in the labor markets as a response to credit availability, I use employee-reported information from the 1930 and 1940 population censuses digitized by Ruggles et al. (2017). Due to concerns about compositional changes in labor markets during the 1930s, I use automated machine linking to match individuals living in California in the 1940 census with a 1930 record. Following the same individual across time helps control for endogenous differences in city labor markets. Changes in city employment shares neglect migration flows and shifts in firms' capital-labor ratio due to credit scarcity which may be functions of local lending levels. Structural unobservables, like workers' resilience to shifts in labor demand, may also affect responses to macro shocks and bias estimates. Individual-level data instead record how a given worker responded to a shock in the 1930s by observing their labor market choices in 1940, controlling for a variety of pre-crisis characteristics.

Each observation is one person, and includes information on city of residence, wage and salary income, industry and occupation, and many demographic variables from both the 1930 census and the 1940 census. I restrict my sample to men living in California aged 26 to 65 in 1940. I count 1930 and 1940 records as matched if they are the only two to report an individual born in the same state with the same spelling-standardized first and last names, and birth years within the same five-year window, as established in Abramitzky et al. (2012).[22] This process results in a panel with one period before the shock and one

[21] Department of Education (1937) cites widespread demand across many locations for canning and packing product and automobile parts manufacturing as key drivers of the state's geographically-distributed manufacturing sector.

[22] Further details on the linking process can be found in the data appendix. All following results are robust

after.[23] Following research on the granularity of local credit markets, e.g. Petersen and Rajan (2002) and Nguyen (2019), I assign Bank of America branch treatment to all individuals living within a five-mile radius of a city centroid with a pre-Depression Bank of America branch in 1940. I geocode individuals in 1930 and 1940 using city of residence, or for rural areas, the enumeration district. Fifty-two percent of the resulting sample of 364,341 men are treated. Using this comprehensive dataset on banking, economic activity, and labor markets in 1930s California, I next provide evidence for my identification assumption.

3.4 Identification

To use pre-Great Depression bank locations to identify the effects of loan supply, the expansion of the Bank of America branching network must not be related to town characteristics in the 1920s. If, for example, Bank of America-branched towns were ex ante different than towns without branches, then treatment may reflect these qualities, not Bank of America's lending during the Great Depression. If on the other hand, Bank of America's arrival altered local economic conditions during the 1920s in a way that affected initial Depression severity, then the crisis lending channel would be mis-identified. I evaluate these two concerns in turn.

If Bank of America selected banks to acquire as branches based on future growth prospects, then interpreting increases in activity as a consequence of a branch opening would be incorrect. First, I drop the twenty largest cities in California by 1929 population due to concerns that Bank of America did not randomly acquire those branches.[24] Because these cities were

to a variety of linking procedures, as also covered in the appendix.

[23] I use 1930 census information to measure pre-crisis variables. The 1930 census was taken in April 1930, which is as near as possible to the traditional start of the Depression. In 1940, California personal income reached its 1929 level, making that census a useful one for measuring recovery. In addition, the start of World War II and the Pacific front mobilization make later years less comparable with the 1930s.

[24] I drop, in descending order of population, Los Angeles, San Francisco, Oakland, San Diego, Long Beach, Sacramento, Berkeley, Pasadena, Glendale, Fresno, San Jose, Stockton, Santa Monica, San Bernardino, Alameda, Santa Ana, Alhambra, Riverside, Bakersfield, Richmond, and Pomona. The next-largest city, Vallejo, had a population of 19,995 in 1929. Appendix Figure 12 plots the propensity of all cities in California to have a Bank of America branch using Equation 1 in 1929 for non-branched cities, branched cities in the sample, and the twenty largest cities in California. There is a clear difference in the probability of treatment

so large, they were especially likely to be branching targets. In fact, five of them served as headquarters for the bank during the 1920s, indicating their desirability. Furthermore, non-bank lending, such as building and loan societies were overwhelmingly concentrated in these cities, complicating measurement of credit availability (California Building and Loan Commission, 1929). To ensure I can measure levels of local loan supply using Bank of America branch locations as of 1929, I first assess the observables on which towns with and without Bank of America branches differ in an extension of the city selection regression in Carlson and Mitchener (2009). Formally, I regress the probability of a city c in county $\mathcal{C}$ receiving its first Bank of America branch between 1922 and 1929 on both city and county-level characteristics:

$$P(BofA_c) = \beta_0 + \gamma DEMOG_{c,1922} + \alpha BANK_{c,1922} + \delta ECON_{C,1920} + \epsilon_{\mathcal{C}c}. \quad (1)$$

City variables include a dummy for having any banks, having a national bank, average capital per bank in the city in 1922, a quadratic in distance to a large city, log 1922 population, banks per 1,000 people in 1922, and the average loan to deposit ratio of existing banks in 1922 . The county controls are the percent growth rate of agricultural output 1910–1920 , the percent of income from agriculture in 1920, whether the county is in northern California, county manufacturing and agricultural income per capita in 1920, and the percent of the population in 1920 which was born abroad.[25] Results are listed in Table 3.[26] The majority of these financial, economic, and demographic variables fail to predict selection into the Bank of

for these cities.

[25] Regression results are robust to constructing city-level equivalents in population growth and foreign-born share, but the sample size is greatly reduced. These tables are available upon request.

[26] The lack of predictors of Bank of America branch status precludes the use of an instrumental variable approach. Because available city-level observables are not correlated with Bank of America branch locations, there is no way to construct a first-stage regression. A similar bank-level regression in Carlson and Mitchener (2009) indicates that few bank-level observables predict eventual Bank of America acquisition as well. The only significant predictors are (negative) net worth to asset ratio, having a bank in the town (due to the state's refusal to let Bank of America *de novo* branch), and having a state bank (negative, because of McFadden Act restrictions). In contrast, other large banks bought banks with a lot of assets, high cash-deposit ratios, high security to interest-bearing asset ratios, high net worth to asset ratios, low city populations and banks per capita (due to their permission to branch *de novo*).

America branch network in 1929. While average capital per bank is statistically significant, it indicates that a one standard deviation increase in capital per bank, equivalent to a capital increase of $50,000 in each bank, would increase the chance of Bank of America opening a branch by 4.9 percent. The impact of the number of banks per capita in 1922 is similarly small in economic significance. Moving from the 25th to the 75th percentile in number of banks per 1,000 people, the equivalent of 1.4 banks per 1,000 people, would increase the probability of Bank of America branch status in 1929 by 3.5 percent. The growth rate of agricultural income is expressed in percentage points, so the coefficient indicates that a 10 percent increase in the growth rate of agricultural income is associated with a 0.68 percent decrease in likelihood of Bank of America entry. Clearly, though, population did play a part in Bank of America branching, as moving from the 25th to the 75th percentile in log population, roughly equal to increasing the population by 1,500, is equivalent to a 13 percent increase in the likelihood of Bank of America acquisition. I will control for population in my results. Finally, a city being located north of the Tehachapi Mountains, the informal boundary between southern and northern California at the time, increases its probability of being a Bank of America branch. Despite the fact that the southern California population exploded in the 1920s, regulators were unwilling to allow the San Francisco-headquartered Bank of America too much entry into southern markets. In part, their reluctance stemmed from their strong Los Angeles bank ties. Through exploitation of loopholes and sheer persistence, Giannini did manage to open branches in many parts of the state. Figure 2a demonstrates that population and city location were not the sole determinants of whether cities received a Bank of America branch.

Although branching status did not vary based on city-level observables in the early 1920s, there is still the possibility that cities' observable quality changed within the decade or that something uncorrelated with the variables in Equation 1 but correlated with economic activity motivated Bank of America's network locations. I test if there is a trend in local economic activity driving the timing and location of branch acquisition in a difference-in-

Table 3: Determinants of Getting BofA from 1922 to 1929

	1(Get BofA branch)	1(Get BofA branch)
1922 banks per 1,000	0.021***	0.023***
	(0.01)	(0.01)
1(Bank in 1922)	-0.12	-0.096
	(0.09)	(0.08)
1(National bank in 1922)	0.099*	0.092*
	(0.05)	(0.05)
Log 1920 city population	0.14***	0.17***
	(0.03)	(0.02)
Distance to large city (miles)	0.000031	0.00037
	(0.00)	(0.00)
Distance to large city sq.	-0.0000014	-0.0000028
	(0.00)	(0.00)
1(County seat)	0.076	0.17
	(0.11)	(0.10)
Percent county income from ag, 1920	0.14	0.13
	(0.16)	(0.16)
Percent growth county ag income, 1910-20	-0.00068*	-0.00066*
	(0.00)	(0.00)
County income per capita, 1920	0.00010	0.00011
	(0.00)	(0.00)
Percent county population foreign-born 1920	0.0088	0.0091
	(0.01)	(0.01)
Percent growth county population, 1910-20	0.00082	0.00074
	(0.00)	(0.00)
1(County in northern California)	0.13*	0.15**
	(0.07)	(0.07)
Average loan/deposit ratio	-0.060	
	(0.04)	
Average capital per bank ($1000s)	0.0018***	
	(0.00)	
Constant	-15.1	-13.8
	(16.05)	(16.12)
Observations	366	366

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), Carlson and Mitchener (2009), and author's calculations. Standard errors clustered at county level in parentheses. County variables are from 1910 and 1920 censuses. City and banking variables measured in 1922 when possible. Both regressions include all incorporated and unincorporated places for which population data in 1920 exist which do not have a Bank of America branch in 1922 and are not one of the 20 largest cities in California in 1929 (see setion 3.1 for details). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

difference approach using the following:

$$Y_{ct} = \Sigma_{\tau=-3}^{3} \delta \cdot 1(BofA, t = \tau) + \alpha_c + \gamma_t + \epsilon_{\mathcal{C}ct}. \tag{2}$$

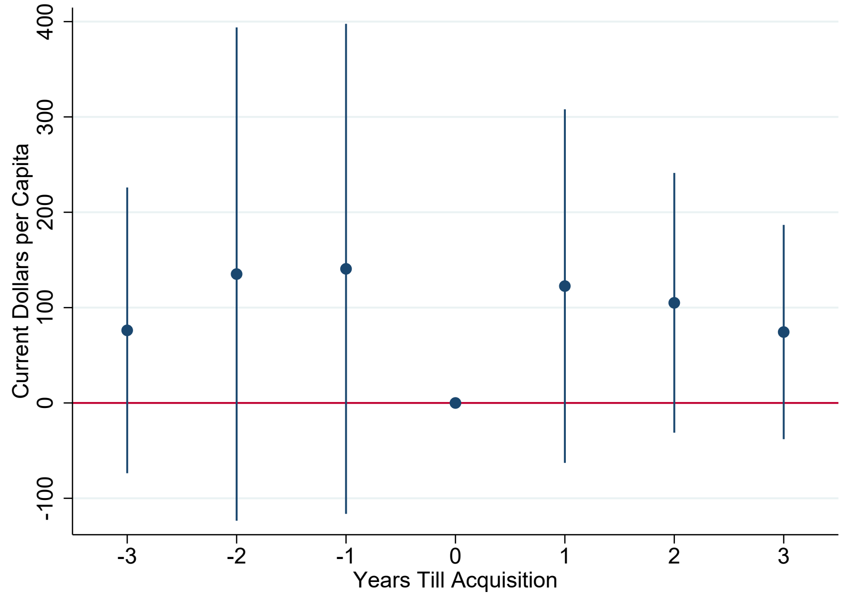
The plotted coefficients measure levels of economic activity in each incorporated town which acquired a Bank of America branch relative to the city and year averages.[27] A positive coefficient would indicate that property values per capita were higher in that specific year relative to other cities and the level of economic activity for that city in the year in which the branch was acquired ($\tau = 0$). Figure 6 plots the δ coefficients. Once again, standard errors are clustered at the county level. The lack of a positive trend in property value per capita around Bank of America arriving in a given city in Figure 6 suggests that regulators did not permit the bank to open branches in systematically better-performing towns. A joint test of the δ coefficients all equally zero is rejected at all conventional levels of significance.[28] Furthermore, there is no upward trend after Bank of America opened in a new town, which indicates first, that having a Bank of America branch did not improve local outcomes before the divergence of the Bank of America's loan-deposit ratio from the state average in the early 1930s, and second, that the timing of branch openings is uncorrelated with a pre-trend in economic growth.[29] For the bank to have chosen a town based on its local economy, these characteristics would have to be uncorrelated with the evolution of property prices in the 1920s, as well as the banking and demographic variables analyzed in Table 3. Also, Figure 2b indicates that Bank of America branches were not systematically located in higher property value per capita cities in 1929, nor were these locations geographically clustered.

[27] Because local economic activity is only available for incorporated cities, in the city-level analysis which follows, I am forced to restrict my sample. Previous results are not driven by incorporation status.

[28] Event studies for total property value and population, the numerator and denominator of my measure of local economic activity, also do not show an upward trend and also have large p-values in a joint test of significance of the δ coefficients.

[29] By 1922, the Bank of America was 35% larger than the second-largest bank by assets in the state, so the lack of effect after the Bank of America's arrival indicates that bank size on its own did not affect local economic activity. This also suggests that the Bank of America's internal capital markets did not improve economic conditions during the 1920s, unlike in Stein (1997), providing further support for interpreting the Bank of America's presence in 1929 as a crisis credit supply proxy.

Figure 6: Event Study Coefficients



Sources: California Board of Equalization (various years), Bleemer (2016), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), and author's calculations. Standard errors clustered at the county level. Coefficients are the δ estimates from Equation 2.

Based on the lack of significant differences in observables, I treat Bank of America branch status as exogenous to Great Depression outcomes conditional on city size. For Bank of America branching locations to proxy for an unobservable driver of 1930s economic growth, this variable would have to be uncorrelated with 1920s economic growth trends and other city-level observables but somehow still correlated with economic activity after 1929. Therefore, I take Bank of America branching locations to be as good as random, conditional on population, in the following analysis. Furthermore, I use Bank of America's locations as a proxy for a smaller credit supply contraction–city variable balance minimizes the threat that credit demand was different in Bank of America branched versus un-branched cities. Based on the parallel trends in loan-deposit ratios before 1929 and banking market and regulatory robustness checks in Section 4.1, the effect of Bank of America's presence in 1929 operated largely through a credit supply channel. Because Bank of America bank acquisitions were statistically quite similar to non-acquired banks, network membership represents a well-defined counterfactual to the unit bank lending contraction. In the next section, I investigate the 1930s more closely.

4 Aggregate Effects of Credit

First, I compare the change in local economic activity during the 1930s based on 1929 Bank of America branch locations. If the availability of credit in a city matters during a financial crisis, then I expect to see that places with Bank of America branches on the eve of the Great Depression had higher growth in local economic activity throughout the 1930s. Using local projections, I construct empirical impulse responses of local economic activity to local credit shocks (Jordà, 2005). Specifically, I model the cumulative change in economic activity from 1929 to each year, ending in 1940, as a function of Bank of America branch status in 1929.[30] This yields estimates of the year-by-year response to the differential lending shock from 1929 to 1933 as proxied by Bank of America's network locations in 1929, conditional on 1929 observables. I estimate, for $h = 1, ..., 11$ the cumulative effect of Bank of America branch status on activity from 1929 to 1940 for a given city c in county $\mathcal{C}$:

$$\begin{aligned}\log y_{c,1929+h} - \log y_{c,1929} = \beta_1 BOFA_{c,1929} + \beta_2 NOBOFA_{c,1929} \\ + \gamma X_{c,1929} + \epsilon_{\mathcal{C}c}.\end{aligned} \tag{3}$$

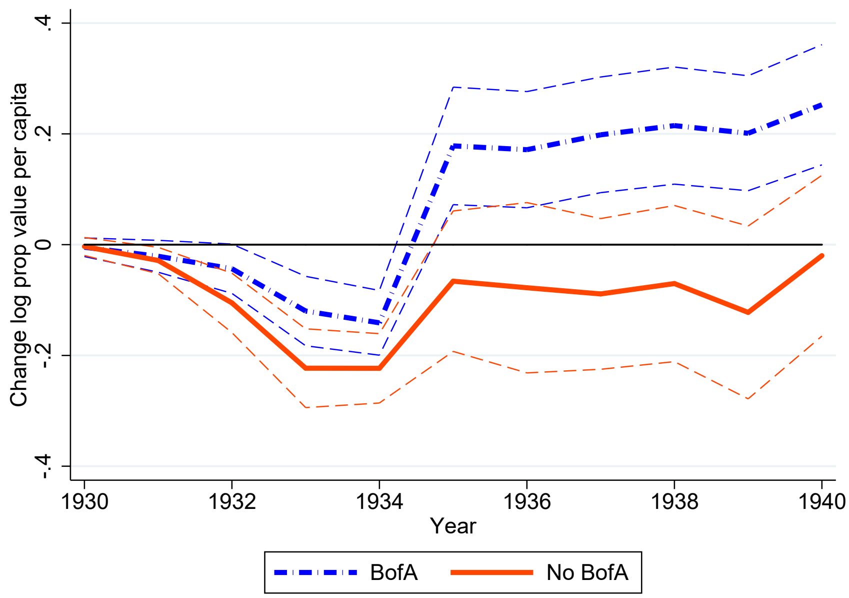
I plot the β coefficients for each year from Equation 3 in Figure 7. β_1 is the dashed blue line and β_2 is the solid red line. Standard errors for each horizon are clustered at the county level. As is common in the literature, I plot 90% confidence bands, which are the thin dashed lines in red and blue. These coefficients and standard errors, along with an F-test for coefficient equality, are displayed for each year in Table 4. The role of local loan supply was

[30] This form of impulse response function is agnostic to the data-generating process, unlike vector autoregressions. Unlike a difference-in-difference approach, local projections allow for a multi-year shock to have dynamic effects which cumulate over time, conditional on the preceding responses.

indistinguishable from 0 based on any standard statistical threshold from 1929 until 1932, when non-branched cities shrank by 10 percentage points more than cities in the Bank of America branch network. In 1933, when the California banking crisis was most intense and state per capita personal income reached its trough, cities all over the state contracted.[31] As in Calomiris and Mason (2003), cities with Bank of America branches had smaller declines in property value per capita during the banking crises of the early 1930s. Unlike Calomiris and Mason (2003), however, this comes strictly from a change in lending, not bank failures. California suffered a decline in lending without many bank closures, and this change in loan supply had real effects on the contraction. On average, no matter a city's branch status, economic activity declined at a statistically significant rate. While cities with more access to credit from 1929 to 1933 shrank by 12 percent, the decline was smaller than the average contraction in the rest of the state. The ten percentage point difference in the magnitude of the contraction is associated with a p-value of 0.009, indicating that there is a simultaneous effect of credit on output during a financial crisis.

[31] California implemented a banking holiday the week before the national holiday. State banking regulators worried that bad weather during the winter would endanger agricultural loans and set off the state's first big bank run of the Depression (Starr, 1996)

Figure 7: Baseline Estimates of Credit Supply Effects on Economic Activity



Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Standard errors clustered at the county level. Thick lines plot the β coefficients from Equation 3 and thin lines are 90% confidence intervals. In each year, the dependent variable is the log change in economic activity from 1929 to that year.

Table 4: Cumulative Growth in Economic Activity, 1929 to 1940

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
BofA, 1929	-0.005	-0.021	-0.044	-0.120***	-0.141***	0.178***	0.171***	0.198***	0.215***	0.201***	0.252***
	(0.010)	(0.018)	(0.027)	(0.038)	(0.035)	(0.064)	(0.064)	(0.063)	(0.064)	(0.063)	(0.066)
No BofA, 1929	-0.005	-0.030**	-0.109***	-0.227***	-0.229***	-0.074	-0.086	-0.096	-0.077	-0.129	-0.026
	(0.011)	(0.015)	(0.034)	(0.044)	(0.040)	(0.081)	(0.097)	(0.086)	(0.089)	(0.097)	(0.091)
BofA - No BofA	0.000	0.009	0.065	0.107	0.087	0.252	0.257	0.294	0.292	0.330	0.279
F-test	0.002	0.381	3.829	7.415	3.833	7.851	5.584	8.421	8.283	9.401	8.188
p-value	(0.968)	(0.540)	(0.056)	(0.009)	(0.056)	(0.007)	(0.022)	(0.005)	(0.006)	(0.003)	(0.006)
N	246	246	246	246	246	246	246	246	246	246	246

Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Standard errors clustered at county level. F-test and p-value refer to an F-test of equality of BofA and NoBofA coefficients, plotted in Figure 7, at each horizon. * $p<0.1$, ** $p<0.05$, *** $p<0.01$

This initial divergence in economic activity during the financial crisis immediately compounded when higher loan supply cities rebounded more strongly. The smaller contraction experienced due to smaller loan supply cuts was followed by an accelerated recovery. After the financial environment stabilized in late 1933, local economic activity grew in Bank of America-branched towns by 30 percentage points between 1934 and 1935, 17 percentage points higher than the non-Bank of America-branched average, the single largest annual difference in the decade.

As recovery set in, this difference persisted. The 25 percentage point difference in economic growth established by March 1935 lasted until 1940. Although one may not reject that non-Bank of America-branched cities recovered back to 1929 levels, those cities did not match the economic growth of branched places. An F-test of equality between β_1 and β_2, also displayed in Table 4, rejects the hypothesis that economic growth was the same, on average, in Bank of America and non-Bank of America cities. In modern terms, this gap is equivalent to the difference in house price growth from 2006 to 2017 between San Jose, which had a strong recovery on the back of the technology sector, and Phoenix, which had one of the worst-performing metropolitan housing markets during the recession. Both phases of economic activity were statistically different based on crisis lending availability. Credit during a financial crisis softens the blow of the aggregate recession while also spurring a recovery, unlike expansion-era credit booms, which hasten financial crises after encouraging growth. The data indicate that relatively plentiful credit availability during the financial crisis leads to smaller contractions, a stronger rebound, and a steeper recovery.

4.1 Other Explanations

To ensure these effects are the product of a Bank of America lending shock during the financial crisis, I rule out several competing explanations. In particular, I argue Bank of America's branching network changed cities' economies solely through its willingness to lend from 1929 to 1933, not its pre-Depression policies, location selection criteria, or correlated city characteristics.[32]

I first assess whether these results are driven by long-run financial development associated with the arrival of the Bank of America in the 1920s. Bank of America implemented several programs to increase access to finance for the community, so the difference in Great Depression outcomes may be a function of financial development, instead of credit supply during the 1930s. Jayaratne and Strahan (1997) demonstrate that states with looser bank branching restrictions had higher subsequent real growth rates. I estimate the following equation from 1923 to 1940 but measure Bank of America branch status based on the year the bank first opened a branch in that city:

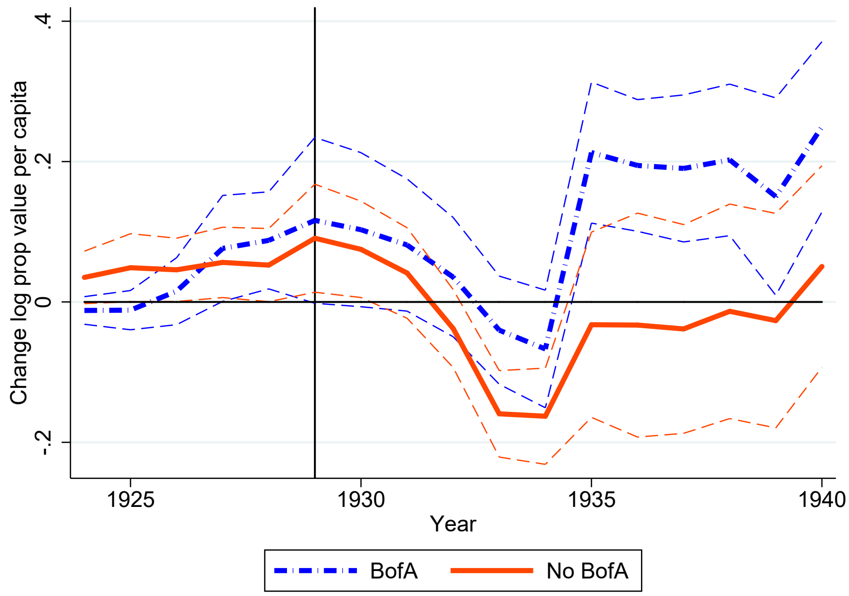
$$\begin{aligned}\log y_{c,1923+h} - \log y_{c,1923} = \beta_1 BOFA_{c,1923+h} + \beta_2 NOBOFA_{c,1923+h} \\ + \gamma X_{c,1923} + \epsilon_{\mathcal{C}c}.\end{aligned} \tag{4}$$

For example, Bank of America acquired First National Bank of Red Bluff in 1927 and opened it as a branch that same year, so Bank of America status is set to 0 before 1927 and 1 from 1927 on for Red Bluff. Figure 8 plots the β coefficients from 1923 to 1940 with 90% confidence intervals based on county-clustered standard errors. F-test statistics for the null hypothesis of $\beta_1 = \beta_2$ are not significant at any standard significance level until the mid-1930s, as presented in Appendix Table 17. Cities with and without Bank of America branches had grown the same amount during the 1920s. Both peak in 1929, but cities with a Bank of America branch have a smaller contraction followed by an immediate recovery, as in the baseline results. I find that divergence in outcomes does not occur until the Great Depression, suggesting that local loan supply, not prior financial development, drove

[32] These differences derive from changes in property value, not population, as demonstrated in the separate local projections for each variable in Appendix Figure 15. Furthermore, placebo estimates of the Bank of America effect, which estimate Equation 3 beginning in 1923 in Appendix Figure 16 and Appendix Table 15 fail to reject that the effect of having a Bank of America branch is different from not having a branch until after the start of the Great Depression. The year-by-year contour of that growth did not vary depending on Bank of America's network. The bank did not systematically access cities based on either stronger-than-average booms or weaker-than-average busts, indicating that local business cycles before the Depression were not correlated with my measure of credit stability in the 1930s.

differences in local economic activity during the 1930s.

Figure 8: Estimates of Financial Development Effects on Economic Activity, 1923–1940



Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Standard errors clustered at the county level. Thick lines plot the β coefficients from Equation 4 and thin lines are 90% confidence intervals. Bank treatment assigned based on whether Bank of America was present in that specific year.

Although Bank of America's lending remained elevated relative to other California banks' policies throughout the Depression, it was credit supply during the financial crisis that mattered. After 1933, the Bank of America resumed its expansion across the state, entering 40 new cities between 1933 and 1940. By that time the overall banking recovery had begun in earnest: survey results displayed in the appendix of Carlson and Rose (2015) indicate that California banks and chambers of commerce felt that the credit shortage was over by 1934.

Using branch location records collected from Transamerica Corporation vs Federal Reserve Board (1953), I split the non-branched cities in 1929 into two mutually exclusive groups: those which gained access to a Bank of America branch during the 1930s and those which did not. I estimate Equation 4 starting in 1923 for cities which had Bank of America branches in 1929 and those which gain a Bank of America branch between 1929 and 1940 and plot the three β coefficients in Figure 9. Places which had Bank of America branches in

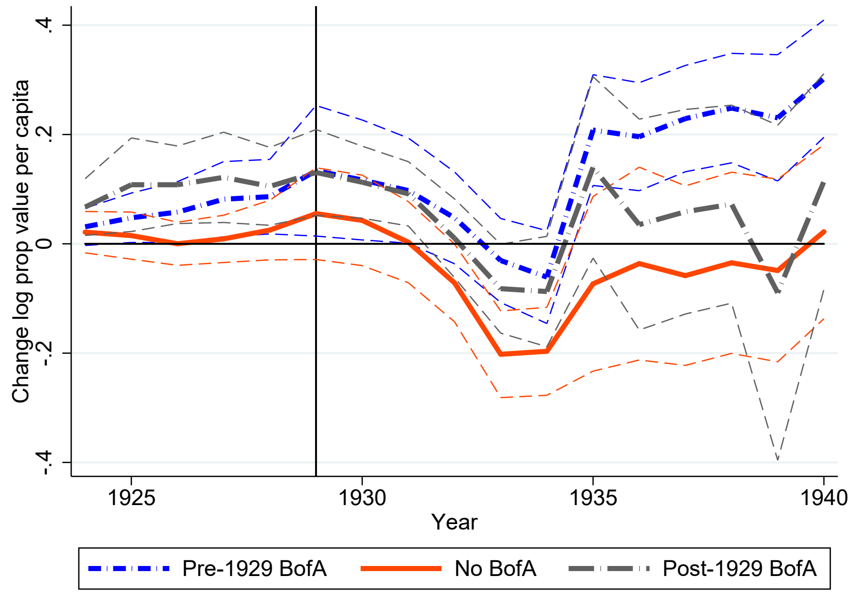
1929 had much stronger recoveries from the Depression than those which received branches after 1933. Between 1929 and 1940, cities in which Bank of America operated throughout the banking crisis grew by 18 percentage points more, a statistically significant difference, as listed in Appendix Table 18. The pre-1929 growth trends for these three categories in the style of Equation 4 indicate that there was positive selection into gaining a Bank of America branch during the 1930s, which cuts against the lack of convergence between pre-Depression and post-1929 branch locations. Because these cities looked similar at the onset of the Depression, and were exposed to the same lending policies after 1933, it must have been the presence of Bank of America during the financial crisis which affected economic growth throughout the decade.[33]

Due to the lack of detailed loan data, I cannot directly test whether Bank of America issued more loans in each of these cities than unit banks. I can however, use an approach common in the banking literature to proxy for crisis period loans with pre-crisis deposit market share (Chen et al., 2017). This definition of loan supply clarifies the mechanism through which Bank of America's presence improved economic activity. The higher the pre-crisis deposit market share, the higher the loan supply during the Great Depression.[34] For every city in California, I calculate the percentage of deposits held by Bank of America in 1928 with records collected by the Federal Reserve for its anti-monopoly case against the Bank of America during the 1940s and 1950s (Transamerica Corporation vs Federal Reserve

[33]The lack of convergence between the 1930s branches and the pre-Depression branches could also be explained by a lack of lending in new branches or a delay in the effects of recovery-period lending until after 1940. Loan-deposit ratios reported in 1931 congressional hearings indicate that Bank of America did not funnel deposits from its newer or more rural branches to other branches (71st Congress, 1931). Due to a lack of evidence from the late 1930s, I cannot prove empirically that the bank continued that practice through 1940. Anecdotal evidence, however, indicates the bank continued to lend at each location. Most of the bank's 1930s expansion occurred in 1935, so for the second explanation to be true, there can be no effects of lending for five years. However, in results available upon request, I show that the 1923–29 and 1929–40 responses of cities entering the Bank of America network at least five years apart were statistically indistinguishable from each other, but larger than the non-branched response, suggesting that such a delay in effects is unlikely to be driving the lack of convergence between pre- and post-1929 branched locations. For these reasons, I take the evidence above as proof that crisis-era lending explains the persistence of economic activity, not either of these alternatives.

[34]This approach is similar to a shift-share; Here I measure exposure to the aggregate credit supply shock using fixed deposit market shares from before the financial crisis.

Figure 9: Crisis versus Recovery Credit Supply Effects on Economic Activity, 1923–1940



Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Standard errors clustered at the county level. Thick lines plot the β coefficients from Equation 4 using three mutually exclusive groups: cities in which Bank of America opened a branch between 1904 and September 1929, cities in which the Bank of America opened a branch between September 1929 and 1940, and cities did not get a Bank of America branch at all before 1940. Thin lines are 90% confidence intervals.

Board, 1953).[35] Then, I calculate the z-score for each city's Bank of America market share so that $BOFASHARE = 1$ represents a market share that is one standard deviation, roughly 35 percentage points, above the mean, approximately 35 percent, in 1928. Cities with no Bank of America branches have a deposit market share of 0. I use this measure to estimate:

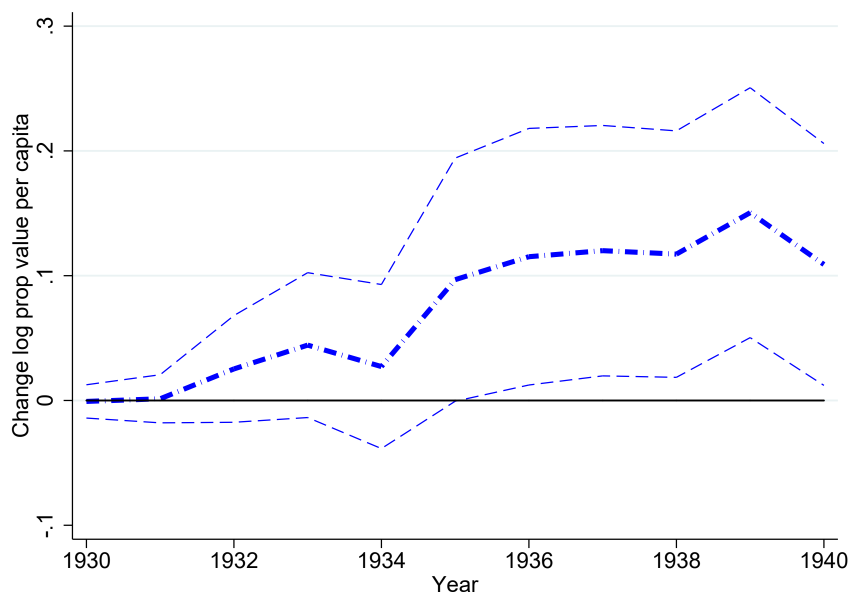
$$\log y_{c,1929+h} - \log y_{c,1929} = \gamma_0 + \gamma_2 BOFASHARE_{c,1928} + \gamma X_{c,1929} + \epsilon_{\mathcal{C}c}. \quad (5)$$

These local projections are plotted in Figure 10 and reported in Appendix Table 19. If Bank of America held thirty percent more of a city's deposits in 1928, then that city grew by 11 percentage points more over the course of the 1930s. A two-standard deviation increase,

[35]These deposit data are the first branch-level records from this time period, to my knowledge. At the time, all balance sheet information collected by regulators was done at the bank level, which was not a problem until the Bank of America began to have a significant presence beyond its flagship bank location in San Francisco.

roughly equal to having no other banks besides Bank of America yields the difference between places with and without Bank of America branches found using the binary measure. Taken with the above results, this suggests that Bank of America's presence in a city in 1929 is a good indicator of heightened levels of lending specifically from 1929 to 1933. Access to more credit, as proxied by Bank of America's presence during the 1929 to 1933 crisis, led to a smaller contraction and a faster, steeper recovery.

Figure 10: 1928 Deposit Market Share and Economic Activity, 1929–1940



Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Standard errors clustered at the county level. Thick lines plot the β coefficients from Equation 4 and thin lines are 90% confidence intervals. Bank treatment assigned based on Bank of America's standardized deposit market share in each city in 1928. The mean and standard deviation of deposit market share in 1928 were both 35 percent.

To address concerns about branch location selection on unobservables, I also leverage banking regulators' branch permit approval criteria at the time of Bank of America's expansion. If cities which received Bank of America branches had economic and financial environments which were systematically predisposed to weather the Great Depression before Bank of America arrived, then the presence of a branch would not represent the causal effect of credit supply. Therefore, I estimate the probability of receiving a Bank of America branch as a function of the explicit regulatory hurdles facing a bank wishing to open a new branch.

Starting in 1918, banks were prohibited from opening *de novo* branches outside their home market, defined as the city in which its headquarters were located.[36] Instead, branch expansion occurred through purchases of existing banks, once the state banking department's "public convenience and advantage" criterion and capital requirements were satisfied. Branching capital requirements were increasing in town size. Cities should have had similar probabilities of Bank of America branch acquisition based on the cities' 1922 population, the average capital and total resources of the cities' banks in 1922, and the total number of banks in 1922 due to these branch opening requirements.[37]

With this intuition in mind, I supplement my original local projection approach with a matching estimator. First, I use quartics in the above banking and population information to estimate each city's propensity of receiving a Bank of America branch in a logit regression. Figure 11a plots the distribution of the probability of being in the Bank of America branch network in 1929 based on whether or not the city was actually in the network. The distributions are similar for treatment and control. The observations which lack a similar-enough counterfactual in the other group are considered off-support, so are not included in the next step of analysis. Confirming anecdotal evidence detailed in the historical context section, the distribution of propensity scores is relatively flat; the Bank of America opened branches in cities with many kinds of banking environments.

Then, I match each city treated(untreated) to the city in the untreated(treated) group with the closest probability of having a Bank of America branch in 1929 in a nearest-neighbor approach, and use this as the counterfactual economic growth outcome for each city. I calculate the treatment effect in each year as the mean difference in outcomes between having a Bank of America branch in 1929 and not having one, denoted α in the equation

[36] Bank of America historians noted that the rule was instituted only after the Bank of America indicated that they would like to establish a presence all over northern and southern California (James and James, 1954).

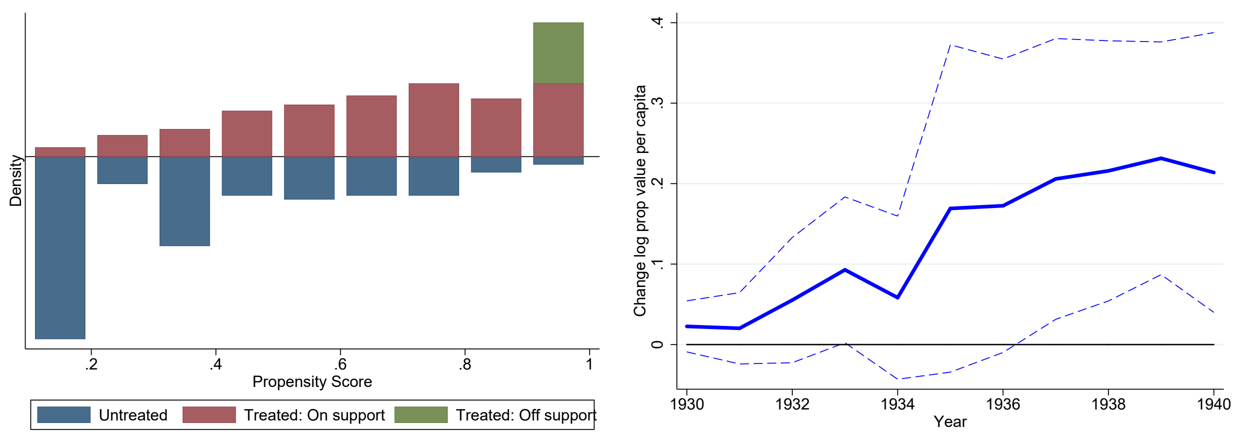
[37] I use 1922 as a reference point because it marks the beginning of Bank of America's statewide expansion, so that the branch acquisition occurs after the measurement of observables, to avoid the simultaneity problem. This also represents the information set of both regulators and bankers at the start of the expansion.

below:

$$\log y_{c,1929+h} - \log y_{c,1929} = \gamma_0 + \alpha P(\widehat{BOFA_{c,1929}} = 1) + \gamma X_{c,1929} + \epsilon_{\mathcal{C}c}. \qquad (6)$$

Figure 11b plots the results for the cumulative local economic activity growth, α from 1929 to each horizon h with 90% confidence intervals based on Abadie-Imbens standard errors (Abadie and Imbens, 2016). Coefficients are displayed in Appendix Table 16. While the results are noisier than my baseline estimates, the differences in cumulative log real estate per capita growth from 1929 to 1940 are similar to the results reported in Table 4. In both cases, the difference in economic activity widened substantially between 1934 and 1935. The overall effect of Bank of America branches is slightly smaller than the baseline specification but still statistically significant.

Figure 11: Propensity Score Matching Results



(a) Propensity Score Overlap

(b) Matching Estimator Results

Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), California Board of Equalization (various years), Bleemer (2016), Carlson and Mitchener (2009), and author's calculations. Standard errors clustered at the county level. The thick plots the α coefficients from Equation 6 and thin lines are 90% confidence intervals using Abadie-Imbens standard errors.

Although I cannot directly observe the amount of lending in each Bank of America branch, I can rule out other channels from banks to the real economy during the 1930s as illustrated in the literature on the Great Depression. First, by estimating Equation 3 for cities with either only a Bank of America branch or a unit bank in 1929, as displayed in Appendix Figure 19, I show that the unit banks' response to the entry of the Bank of America demonstrated in Carlson and Mitchener (2009) does not account for the positive effect of the Bank of America during the 1930s. Second, although Federal Reserve discount window access has been shown to improve banks' health in the 1930s, restricting my sample to cities with Bank of America or some other Federal Reserve member bank in 1929 does not affect my baseline results, as seen in Appendix Figure 18 (Richardson and Troost, 2009; Ziebarth, 2013).[38] These results are also robust to dropping cities with unit bank failures during the banking crisis, eliminating the possibility that lack of convergence between Bank of America-branched and non-branched cities is a function of deposit liquidation depressing activity as in Anari et al. (2005). Finally, although I have treated the Bank of America as one organization in the 1930s, it actually operated both a national bank-chartered branch system and a Federal Reserve member state bank-chartered system from 1927 to 1934. The effects of having a state Bank of America branch and national Bank of America branch in 1929, plotted in Appendix Figure 17 are statistically indistinguishable, indicating that regulatory differences e.g. differences in liability structures, do not drive the baseline result (Anderson et al., 2019; Mitchener and Richardson, 2013).[39] Together, these results indicate that banking market or institutional differences correlated with the Bank of America's presence cannot account for its association with smaller contractions and stronger recoveries.

In the appendix, I demonstrate that employment, New Deal, or Dust Bowl migration shocks are not driving these results. If Bank of America locations in 1929 were correlated with exposure to other Depression-era shocks, identification would not hold. Therefore, I split the sample based on whether or not a city's share of employment in a given industry was above or

[38] Qualitative evidence suggests the Bank of America did not receive preferential treatment from either the Federal Reserve Bank of San Francisco or the Federal Reserve Board of Governors–by and large employees of the Federal Reserve System were openly hostile to the Bank of America, with the one officer repeatedly calling Giannini racial slurs in the press (James and James, 1954).

[39] In local projections available upon request, I drop all cities without a national bank to hold the regulatory regime constant, and the baseline results still hold, further ruling out charter differences as an explanation for the Bank of America effect.

below the sample median in 1930. All four of these sectors were hit by demand shocks in the 1930s.[40] Table 10 estimates Equation 9 for each of these subgroups. In each classification, I fail to reject that cities with less access to credit in the Depression had zero economic growth during the 1930s. In contrast, Bank of America-branched cities grew during the decade, for the most part. The Bank of America coefficient in 1930s growth is statistically significant for all but agriculture-oriented and less-manufacturing-dependent cities. In the case of farming-heavy cities, the presence of Bank of America still caused significantly higher growth. Despite the variation in exposure to external shocks based on employment, cities with relatively more credit in the Great Depression outperformed other cities. Furthermore, splitting the sample into above and below-median 1923–29 economic growth samples, respectively, in Appendix Tables 11 and 12, does not alter the results; economic trends before the Great Depression fail to explain the importance of Bank of America's branch network. A similar exercise is conducted with respect to 1929 city population in Appendix Tables 13 and 14 and the baseline still holds. In Appendix Figure 13, I include county-level New Deal per-capita spending from Fishback et al. (2003) as a control in Equation 3, and the local projection remains unchanged. I also include region fixed effects and a variety of other city-level controls on the right-hand side of Equation 3 in Appendix Figure 14, which absorbs shocks to particular parts of California, such as Dust Bowl migration, and other city-level characteristics which may determine credit demand. For a factor to confound the identification of 1930s loan supply using 1929 Bank of America branch locations, it would have to be uncorrelated with the pre-expansion financial environment, 1920s economic growth, and 1930 industrial structure but correlated with the bank's network starting in 1929. Therefore, I interpret the lending effects of Bank of America's presence on cities' economic activity as causal. Access to a Bank of America branch during the early 1930s softened the blow of the financial crisis and led to a stronger recovery. Next, I test potential explanations for the persistent effect of loan supply during the Great Depression.

[40] See Romer (1990) and Olney (1999) on durables, Madsen (2001) on trade, Mishkin (1978); Temin et al. (1976) on household spending, and Alston (1983) and Hausman et al. (2019) on farming.

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5 Labor Market Changes

By 1940, California state personal income had surpassed its 1929 level. However, recovery from the Great Depression was not equally distributed across the state. Cities without Bank of America branches during the Great Depression still had markedly lower levels of economic activity than those cities with branches in 1929. In this section, I examine the labor market mechanisms for these persistent differences in economic activity. Using worker-level data measured before and after the banking crisis, I track shifts in labor market outcomes as a function of cities' relative credit availability. I account for 1930 characteristics which may have affected individuals' labor market outcomes. Identification rests on the assumption that Bank of America proximity in 1940 was as good as random, conditioning on these city and individual-level controls measured in 1930.[41] With this assumption in mind, I analyze men's labor market outcomes in 1940 as a function of whether or not their place of residence is within five miles of the Bank of America network in 1929.[42] For individual i in city c in 1940, I estimate the following regression for labor outcome Y:

$$\begin{aligned} Y_{i,c} = \gamma_0 + \beta_1 ProximitytoBOFA_{c,1929} + \gamma_1 X_i + \gamma_2 X_c \\ + \lambda_{\mathcal{C}} + \lambda_{j,1930} + \lambda_{o,1930} + \epsilon_{\mathcal{C}c}. \end{aligned} \tag{7}$$

To control for differences in the broader labor market within the state, I employ 1940 county of residence($\mathcal{C}$) fixed effects and cluster my standard errors at that level. I also include

[41]By using individual-level variation, I abstract away from concerns that cities with Bank of America branch locations in 1929 were somehow more suited towards a transition to certain sectors. Instead, I control for a variety of individual-level characteristics which may affect labor market outcomes.

[42]This geographic measure of nearness to Bank of America lending captures the importance of soft information for relationship lending but also allows workers to have some choice in where they work. The following results are robust to other geographic cutoffs. Results for several outcomes are displayed in Appendix Figure 20. The decline in the effect of Bank of America as the distance cutoff increases indicates that Bank of America did lend more to people closer to its branches.

fixed effects for each individual's occupation (o) and industry (j) group in 1930.[43] In several specifications, I relax the identification assumption further, and conduct my analysis in first differences, which subtract out individual-level unobservables. The explanatory variables in γ_1 and γ_2, along with the fixed effects, control for the incidence of other Great Depression shocks and other determinants of labor market outcomes. The coefficient of interest is β_1, which measures the difference in income, for example, between otherwise identical men in Bank of America-branched and non-branched cities in 1940.

5.1 General Characteristics in 1940

The results in Table 5 confirm the results of the previous section. Employment, like economic activity, recovered to its pre-Depression level independent of crisis credit availability. There is no statistically significant difference in labor force participation or unemployment rate based on 1929 Bank of America branch locations.[44] The level of churn in these labor markets was similar as well; workers were no more likely to have changed occupation groups between 1930 and 1940 if they were near a 1929 Bank of America branch.

However, there is a large, statistically significant lending stability premium for income. Wage and salary income was 13.7 percent higher in Bank of America-branched cities in 1940. The 1940 Census was the first to ask about income, so I cannot construct a longitudinal measure of income from 1930 to 1940.[45] Instead, I report the percent change in $OCCSCORE$, a commonly-used alternative which ranks occupations based on the median income associated with that occupation in 1950. Increases in $OCCSCORE$ signify moving up the occupational ladder. Living near a 1929 Bank of America branch is associated with a 13.4 percent increase in $OCCSCORE$ from 1930 to 1940, which is roughly equivalent to moving from working on an oil derrick to being a real estate broker. Cities with smaller

[43]Sample categories include farmer, farm laborer, manager, and sales worker for occupation. For industry group, groups include mining, durable manufacturing, and personal services.

[44]These and the following results are robust to dropping rural areas, for which I did the geocoding. Robustness checks available upon request.

[45] It also only asked about wage and salary income, so business owners reported no income. Therefore, I restrict the estimation of the income coefficient to men reporting a nonzero income.

Table 5: 1940 Labor Market Based on 1929 BofA Locations

	P(In LF)	P(Unemp)	Log W+S Inc	P(Change Occ)	Pct Ch Occscore
Proximity to $BOFA_{1929}$	0.0110	0.00162	0.137***	0.00678	0.134***
	(0.014)	(0.006)	(0.022)	(0.009)	(0.028)
Observations	364341	304553	228139	364341	315738

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), Morse et al. (n.d.), and author's calculations. Standard errors clustered at 1940 county level. Other explanatory variables in these regressions are 1(white), a quadratic in age, dummies for having an eighth grade education, 1930 marital and rural status, 1930 city of residence population, and fixed effects for 1940 county and 1930 industry and occupation groups. Only men over the age of 16 in 1930 living in California in 1940 included. Proximity is 1 if within five miles of a 1929 BofA location in 1940. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

lending cuts during the 1930s had both higher wages and workers who acquired more skills during the decade. The equilibrium level of employment was no higher, but workers were more skilled and better-paid. The workers who changed job types differentially moved into higher-skilled jobs if living near a 1929 Bank of America branch. To understand better how employment changed based on credit availability, I turn next to changes in the composition of labor.

The differences in the labor market, like the differences in overall economic activity, are a function of access to Bank of America during the 1929 to 1933 period. Column 1 in Table 8 restricts the sample to labor markets within five miles of a Bank of America branch opened by 1940. Incomes are still significantly higher in areas close to a 1929 Bank of America branch. Because these cities were otherwise quite similar at the start of the Depression and had equal exposure to Bank of America after 1933, the differences in their labor markets in 1940 must be due to Bank of America's presence during the financial crisis, not its presence during the recovery.

If cities with higher access to credit simply had higher ability workers, then it is not possible to attribute the differences in economic activity, wages, and unemployment to loan supply. I address this concern about the correlation between labor market unobservables and credit in several ways. First, I use the longitudinal aspect of my worker-level dataset to estimate the effect of Bank of America proximity on first differences in occupational standing in Table 5, and find large, significant effects of credit stability. Workers near Bank of America branches move up the occupational ladder at higher rates than other workers, even when differencing out individual unobservables. Second, I can estimate the effects on wages in 1940 using more detailed industry and occupation fixed effects. In the final column of Table 8, I use the most disaggregated possible occupation and individual fixed effects in a specification otherwise identical to Equation 7. These fixed effects differentiate between an auto mechanic and radio mechanic, in the occupation case, and fabricated steel production and other fabricated metal production for industries, for example. Including these measures for workers' 1930 status narrows down the comparison group substantially. Nonetheless, I still find a significant credit stability premium for wages of 13.2 percent, indicating worker quality cannot explain the effects above. Finally, in Appendix Tables 24 and 25, I restrict my sample to men who lived in Bank of America-branched places in 1930, and in Appendix Tables 26 and 27 to men who did not live in Bank of America-proximate labor markets in 1930, to hold constant selection into locations in 1930. All baseline industrial and occupational employment results carry through, indicating that the labor market effects of credit supply were not simply a function of pre-crisis worker allocations.

5.2 Industry and Occupation Changes

Using the occupation and industry information reported for each person in both censuses, I measure the marginal effect of credit stability on the composition of employment. In the following results, the dependent variable is a dummy for working in a given job type in 1940, conditional on a variety of 1930 and 1940 characteristics, as in Equation 7. Table 6 reports the results for each industry, as well as the employment share by sector in the sample. Panel A estimates the overall probability of an individual working in a given industry in 1940 while Panels B and C split the sample based on whether or not a given worker was employed in that industry in 1930. Cities with more stable credit levels had smaller farm and mining sectors due to more workers exiting the sector and fewer workers entering the industry during the 1930s. These effects are large: on average, workers in Bank of America-branched cities had a 10.5 percent lower probability of working in the commodity sector, which is one third of the sample mean agriculture and mining employment share. This runs against the disruption in the rural to urban transition experienced in the United States during the 1930s (Boyd, 2002; Kuznets and Thomas, 1957).[46]

Differential entry and exit cannot be explained by overall changes in the size of the labor force or the number of workers employed. Instead, workers in cities with more stable lending shifted into the retail and service industries at rates roughly one fourth of the sample sector employment share.The effects on transportation and manufacturing employment are small and insignificant. Evidence across most sectors in Panel C also suggest that workers were more likely to remain in the same industry if they lived in a credit-stable environment.

The aggregate effect on employment churn noted in Table 5 masked the divergence in occupational stability between agriculture and all nontradable sectors. Credit, however, had a stronger effect on net entry into specific sectors, as demonstrated in Panel B. On average, workers in Bank of America-branched cities were three percent more likely to enter service and retail employment. Although the labor force participation and unemployment rates were similar in treated and control locations, there was a divergence in the allocation of workers. Industrial employment, which was no different based on Bank of America's locations in 1930, was weighted towards nontradable sectors and away from commodity production as a function of credit availability.

Occupational employment shares, displayed in Table 7, tell the same story. Overwhelmingly, workers in cities which had Bank of America branches during the Great Depression reallocated away from farming. The 11.5 percent reduction in farm employment is statistically significant at the one percent level. Professional and managerial occupational em-

[46] In results available upon request, I stratify the baseline results by 1930 proximity status, and find the same effects for living near a 1929 branch in 1940, eliminating the possibility out-of-state migration, e.g. Dust Bowl migrants, drives these results. Conditional on observables, movement of workers more inclined to nontradable work to Bank of America-branched areas, however, is included in the treatment effect.

Table 6: Industrial Employment Shares, 1940

Sample Sector Emp. Share	Ag/Mining 0.291	Mfg/Cons. 0.283	Trans/ Util 0.070	Retail/Wholesale 0.168	Gov. 0.038	Services 0.136
A: Overall Effect						
Proximity to $BOFA_{1929}$	-0.105***	0.00925	0.00861	0.0407***	0.00853***	0.0305***
	(0.0271)	(0.00892)	(0.00527)	(0.00961)	(0.00311)	(0.00514)
R-sq	0.22	0.10	0.07	0.09	0.07	0.09
N	364341	364341	364341	364341	364341	364341
B: Not In Sector, 1930						
Proximity to $BOFA_{1929}$	-0.0825***	0.00580	0.00530	0.0320***	0.00698**	0.0224***
	(0.0261)	(0.00708)	(0.00396)	(0.00804)	(0.00267)	(0.00428)
R-sq	0.13	0.06	0.01	0.04	0.02	0.02
N	264168	297557	341235	324670	356822	323213
C: In Sector, 1930						
Proximity to $BOFA_{1929}$	-0.158***	0.0257	0.0508**	0.107***	0.0878***	0.0935***
	(0.0269)	(0.0178)	(0.0227)	(0.0241)	(0.0251)	(0.0161)
R-sq	0.14	0.09	0.10	0.07	0.19	0.08
N	100173	66784	23105	39671	7518	41128

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), Morse et al. (n.d.), and author's calculations. Standard errors clustered at 1940 county level. Other explanatory variables in these regressions are 1(white), a quadratic in age, dummies for having an eighth grade education, 1930 marital and rural status, 1930 city of residence population, and fixed effects for 1940 county and 1930 industry and occupation groups. Only men over the age of 16 in 1930 living in California in 1940 included. Proximity is 1 if within five miles of 1929 BofA location in 1940. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

ployment was 6 percent higher and sales and clerical work was 3.35 percent higher in Bank of America-branched cities. Laborer and craftworker employment did not vary based on crisis credit availability. These changes in occupational composition hold true regardless of whether or not workers were already in those occupation groups in 1930. Overall, the composition of labor in Bank of America-branched cities shifted towards higher-skilled, less agricultural occupations in the 1930s.

These employment and income results are not driven by particular pre-crisis city industrial or occupational structures either. I split the sample based on whether or not the worker's 1940 labor market was above or below the state median employment share in that occupation or industry in 1930 and re-estimate the wage and employment share results for those subgroups. Overall, the pattern of Bank of America-branched places having higher

Table 7: Occupational Employment Shares, 1940

Sample Occ Group Emp. Share	Prof/Mgr. 0.187	Farming 0.219	Nonfarm Lab. 0.104	Sales/Cler. 0.103	Craft/Op. 0.335	Service 0.053
A: Overall Effect						
Proximity to $BOFA_{1929}$	0.0602***	-0.115***	-0.00142	0.0335***	0.0181	0.0151***
	(0.00685)	(0.0323)	(0.00509)	(0.00632)	(0.0182)	(0.00372)
R-sq	0.08	0.18	0.03	0.05	0.08	0.01
N	422022	422022	422022	422022	422022	422022
B: Not In Occ Group, 1930						
Proximity to $BOFA_{1929}$	0.0470***	-0.0867***	-0.00245	0.0268***	0.0114	0.0125***
	(0.00494)	(0.0274)	(0.00423)	(0.00449)	(0.0141)	(0.00295)
R-sq	0.06	0.13	0.03	0.04	0.08	0.00
N	377606	334891	383454	383268	326056	409552
C: In Occ Group, 1930						
Proximity to $BOFA_{1929}$	0.118***	-0.187***	0.0129	0.0793***	0.0449*	0.0853***
	(0.0194)	(0.0276)	(0.0139)	(0.0227)	(0.0260)	(0.0219)
R-sq	0.11	0.16	0.06	0.06	0.08	0.07
N	44416	87131	38568	38754	95966	12470

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), Morse et al. (n.d.), and author's calculations. Standard errors clustered at 1940 county level. Other explanatory variables in these regressions are 1(white), a quadratic in age, dummies for having an eighth grade education, 1930 marital and rural status, 1930 city of residence population, and fixed effects for 1940 county and 1930 industry and occupation groups. Only men over the age of 16 in 1930 living in California in 1940 included. Proximity is 1 if within five miles of 1929 BofA location in 1940. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

and statistically significant levels of income holds for both occupational shares in Appendix Table 20 and industrial employment shares in Appendix Table 21. Skilled and nontradable employment are larger in cities with higher levels of local loan supply, regardless of pre-crisis employment shares as well, as seen in Appendix Tables 22 and 23, respectively. Any explanation for how credit availability during a financial crisis leads to large, persistent differences in economic activity must reflect these skill-biased compositional changes.

5.3 Potential Mechanisms

Differences in relative credit availability translated into different levels of recovery during the 1930s. Cities with Bank of America branches transitioned towards nontradable, higher-skilled, and higher-paid employment in the same period. An explanation for the shifts in employment must also be consistent with the small contraction followed by a large and persistent rebound in economic activity at the city level. In this section, I examine a variety of economic mechanisms consistent with this evidence.

Table 6 and Table 7 both indicate that workers in cities with Bank of America branches were more likely to be in the same industry and occupation type in 1930 and 1940, respectively. If credit reduced pressure to cut employment, then job-specific human capital losses would be lower in places with more stable credit during the 1930s. Workers who stayed in the same occupation or industry group in Bank of America-branched cities would have particularly high incomes in this case. To test this assumption, I interact the dummy variable for Bank of America proximity with a dummy for staying in the same occupation group in a difference-in-difference specification of the form:

$$\begin{aligned} Y_{i,c,j} &= \gamma_0 + \beta_1 BofA_c + \beta_2 SAME_i + \beta_3 BofA_c \cdot SAME_i \\ &+ \gamma_1 X_i + \gamma_2 X_c + \lambda_{\mathcal{C}} + \lambda_{j,1930} + \lambda_{o,1930} + \epsilon_{\mathcal{C}c}. \end{aligned} \tag{8}$$

The results of this regression, and the analogous specification for staying in the same industry, are displayed in Table 8. In both cases, the interaction term is insignificant, suggesting that the wage premium and persistently strong recovery in Bank of America places were not due to credit ensuring employment stability.

Similarly, the degree of industrial concentration may have magnified the effects of Bank of America's presence. If the availability of credit in a given city made it easier for firms to operate during the financial crisis, then agglomeration effects in particularly concentrated industries should have created a wage premium for workers in that industry. Using a difference-in-differences specification like Equation 8 with a dummy for workers operating in a city's largest industry by employment in 1930, I find no evidence of a wage premium for workers in a high-employment share industry in a Bank of America-branched city. Table 8 presents wage results for industrial and occupational concentration difference-in-difference

Table 8: Testing Explanations For Persistence

	1929 vs 1940 BofA	Stay Occ	Stay Ind	Big Occ	Big Ind	Detailed 1930 FE
Proximity to $BOFA_{1929}$	0.0535**	0.138***	0.133***	0.131***	0.110***	0.132***
	(0.0247)	(0.0237)	(0.0232)	(0.0242)	(0.0208)	(0.0224)
Ind/Occ Variable		0.139***	0.0916***	-0.0478*	-0.184***	
		(0.0126)	(0.0111)	(0.0259)	(0.0271)	
Proximity to $BOFA_1 929 \cdot$ Ind/Occ		-0.00407	0.0175	0.0158	0.0548	
		(0.0127)	(0.0109)	(0.0364)	(0.0345)	
R-sq	0.22	0.21	0.21	0.21	0.22	0.22
N	112456	228139	228139	228139	228139	207364

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), Morse et al. (n.d.), and author's calculations. Standard errors clustered at 1940 county level. Other explanatory variables in these regressions are 1(white), a quadratic in age, dummies for having an eighth grade education, 1930 marital and rural status, 1930 city of residence population, and fixed effects for 1940 county and 1930 industry and occupation groups. Only men over the age of 16 in 1930 living in California in 1940 included. Proximity is 1 if within five miles of 1929 BofA location in 1940. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

estimation. Additionally, if agglomeration drew workers into nontradable production, then the effects of credit should be limited to nontradable-oriented cities. However, Bank of America-branched cities with below-median retail and service employment in 1930 also saw increases in nontradable employment relative to cities without branches, as displayed in Appendix Table 23. Credit availability could not have operated through the agglomeration channel to create these differences in economic activity and labor markets.

Firms without access to credit may have reduced capital and innovation expenditures, as suggested in Huber (2018). Under this hypothesis, lower levels of economic activity persist because firms facing lending instability cannot replace depreciating capital or invest in more productive technologies. However, I find no differences in the employment of craftsmen and operatives, who were the capital-complementary manufacturing workers of the time, as seen in Table 7.[47] The size of the manufacturing sector, as well as the composition

[47] At the heart of this difference is the nature of California manufacturing at the time. Nanda and Nicholas (2014) demonstrate that firms in the 1930s did alter innovation activities after bank failures. However, during the 1930s, California manufacturing was either agriculture-complementary (e.g. canning materials for peach processing) for shipping outside of the state or derived from the state's isolation from the nation's manufacturing centers. For example, the state made a lot of tires because it was far enough from Detroit to make anything less valuable than the car itself worthwhile to produce in the state. Therefore, unlike modern-day Germany, California manufacturing was either tied to commodity demand or state-level demand (Rhode, 1995).

of manufacturing-relevant skilled and unskilled occupations, did not change as a result of Bank of America proximity, suggesting that this channel was not at work in the California context.[48]

Instead, areas with more stable credit during the early 1930s had larger nontradable sectors in 1940. The reallocation of labor as a function of crisis-era credit supply may have been due to either firm or household credit. However, several historical observations suggest that external financial dependence did not vary significantly between the agricultural and nontradable sectors. Agriculture was very capital-intensive in California as compared to the rest of the country (Olmstead and Rhode, 2017). According to a contemporary agricultural economist, even small California farms needed an average of $\$20,000$ in credit every year (Nash, 1992). Nontradable firms were usually very small, especially family-owned retail stores, so bank credit was likely crucial for funding (Kidner, 1946; Department of Education, 1937). Retailers and wholesalers depended on local bank credit for inventory financing, while small manufacturing firms, like those in the estimation sample, needed banking access to fund working capital.[49] According to Mitchener and Wheelock (2013), small firms were unlikely to borrow from nonbank sources before World War II. Instead, as in the the modern period, local banks were well situated to evaluate soft information associated with lending and therefore were the primary source of small business credit (Petersen and Rajan, 1994). If one assumes that credit demand is balanced between sectors, as these anecdotes suggest, and that credit demand differences within sector were not correlated with Bank of America's presence, as the balance in employment shares in Appendix Table 33 and incorporation

[48]The lack of significant effects in manufacturing do not appear to be a symptom of Bank of America-branched cities having large, incorporated establishments which could use the bond market for external finance, as in Benmelech et al. (2019). Using Census of Manufacturing establishment data gathered by Vickers and Ziebarth (2018), Appendix Table 9 shows that there was no difference in the probability of incorporation or total number of workers based on Bank of America's network in 1929. In results available upon request, I show that 1935 firms were similarly indistinguishable. The median number of firm employees in 1929 was 48, indicating these are small, bank credit-dependent firms, according to the modern literature (Gertler and Gilchrist, 1994)

[49]The median manufacturing establishment in California outside of the twenty largest cities had 48 employees. IRS and Census of Manufacturing data cited in Richardson and Gou (2013) indicate that 86% of small manufacturing firms used banking credit for working credit. Furthermore, manufacturers with profits under $5,000 were much more likely to be net creditors of banks than larger manufacturers.

probabilities in Appendix Table 9 indicate, then the effects of credit supply cannot have worked through a firm credit channel. If these firm credit assumptions are true, then there would be no reason for nontradable firms to react to the availability of credit differently than agricultural or manufacturing firms.

Bernanke (1983) cites contractions in local demand as particularly dangerous symptoms of financial distress. The results presented above are consistent with local demand responses to loan supply driving the pace and strength of the recovery from a financial crisis as well. Cities with access to Bank of America from 1929 to 1933 had smaller contractions in economic activity, suggesting local demand remained relatively strong. Global declines in demand for tradables limited the extent to which agriculture could compete with nontradable labor demand in the worst of the Depression.[50] As a result, employment shifted towards retail and services in Bank of America-branched cities. As the larger economy recovered, demand for tradable labor production increased in credit-rich and credit-scarce locations, leading to recovery in the latter half of the 1930s regardless of lending stability. Local demand, and therefore nontradable production remained high in Bank of America-branched places, leading to persistent differences in the level of local economic activity.

Credit's effect on local demand during the financial crisis is also consistent with the income results above. Nontradable labor demand would have increased competition for labor in credit-rich areas, driving up wages, as in Table 5. The sectoral shift out of farming and into managerial and sales positions also reallocated labor towards higher-status jobs like bookkeeping and shop-keeping, which are particularly concentrated in the service and retail sectors. Occupational reallocation towards higher-skilled jobs therefore could have persistent income effects. By 1940, economic activity across California had recovered to 1929 levels, confirming the equal levels of employment and labor force participation in 1940. Together, the city and individual-level results indicate that credit during the early 1930s softened the

[50] If each city is small relative to the overall economy, then city-level tradable demand variation will not have an effect on the global demand for tradable goods. However, nontradable production should respond to local demand.

blow of the financial crisis, and through the local demand channel and skill-biased labor reallocation, led to a strong recovery.

6 Conclusion

According to A.P. Giannini, loans were intended to "aid all the functions of business" (Dana, 1947). His bank, the Bank of America, continued to make those loans during the Great Depression even when other banks balked. As a result, even though few banks failed in the state, some towns all over California had much better access to credit supply during the banking crisis of the early 1930s. These cities, despite their similarity to those without access to Bank of America during the 1920s, contracted by ten percentage points less from 1929 to 1933.

The spillovers from credit supply shocks to the real economy persisted even after California returned to full employment. Areas with Bank of America branches grew by 25 percent during the decade 1930–40, while those without branches did not grow at all. This divergence warrants an investigation into how financial frictions translated into lasting local economic differences. Traditional models of financial frictions, such as Bernanke and Gertler (1989), suggest that after a financial crisis, economies make a full recovery. However, both long-run cross-country evidence and cross-locality evidence from the Great Recession indicate that economies are slow to return to trend growth after a financial crisis (Jordà et al., 2013; Krishnamurthy and Muir, 2017; Romer and Romer, 2017; Mondragon, 2018). The same was true in Great Depression California: cities with larger credit supply contractions failed to converge by 1940 to the recovery made by cities with smaller declines in loan access. Using individual-level longitudinal data, I confirm that cities in with Bank of America branches had significantly higher wages but similar levels of unemployment relative to their non-branched counterparts. In response to credit availability, workers overwhelmingly left agriculture for nontradable employment. These microdata-based results suggest that local demand's response to a credit supply shock can persist through a labor market channel. This paper contributes a new mechanism, skill-biased labor reallocation, as an explanation for the sluggishness of recoveries after financial crises.

Together, these results indicate that credit supply had large effects on both the size of the economic contraction and the strength of the recovery during the 1930s even without the bank failure channel. Due to its ability to branch, the Bank of America cut lending by less than its unit bank counterparts from 1929 to 1933. This led to greater output stability in the cities in which it was located relative to other cities in California, suggesting that the Bemanke and James (1991) hypothesis that unit banking amplified the banking crisis through a money supply channel. Because other states did not allow branching on the scale of the Bank of America's network, other parts of the United States would have experienced 1930s growth patterns more like California cities which did not have a Bank of America branch. Despite its contemporary reputation as unsafe, branching proved beneficial relative to traditional American banks in a period of economic volatility through wider scale and diversification.

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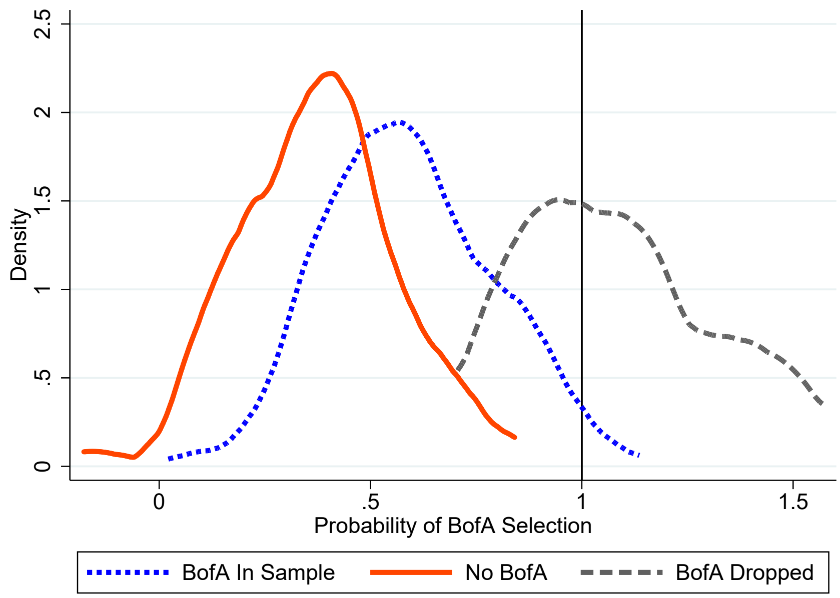
7 Appendix

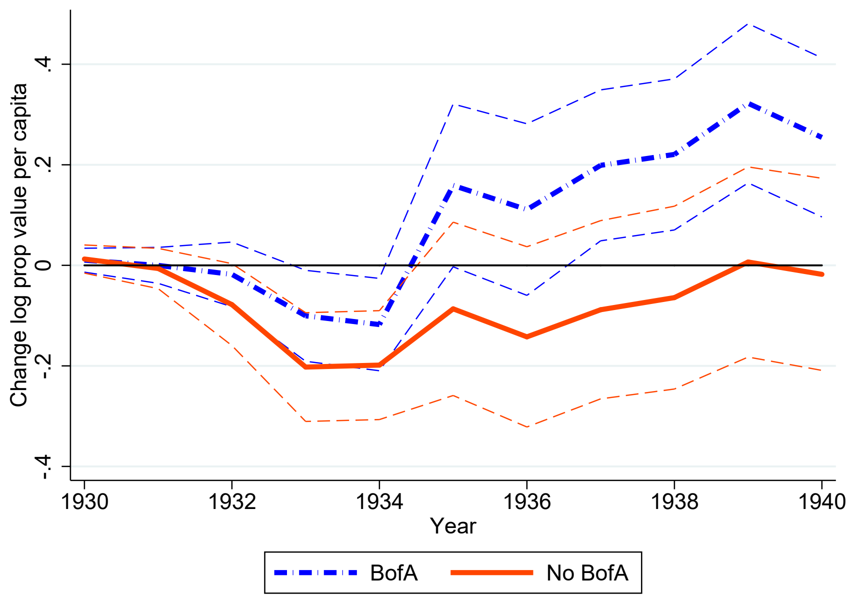
7.1 Figures

Figure 12: Density of Bank of America Branch Likelihood by Branch Status and City Size



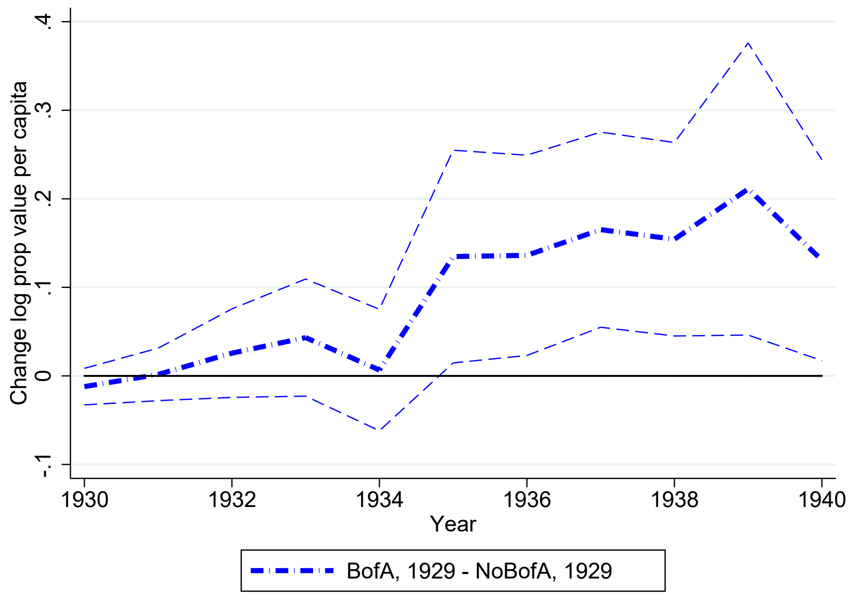
Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Carlson and Mitchener (2009), and author's calculations. Each line is a kernel density plot of the predicted probability of getting a Bank of America branch by 1929 using the specification in Equation 1 for all cities in California. The gray dashed line represents the 20 largest cities in California which are dropped from the analysis in the rest of the paper.

Figure 13: Adding County-Level New Deal Spending



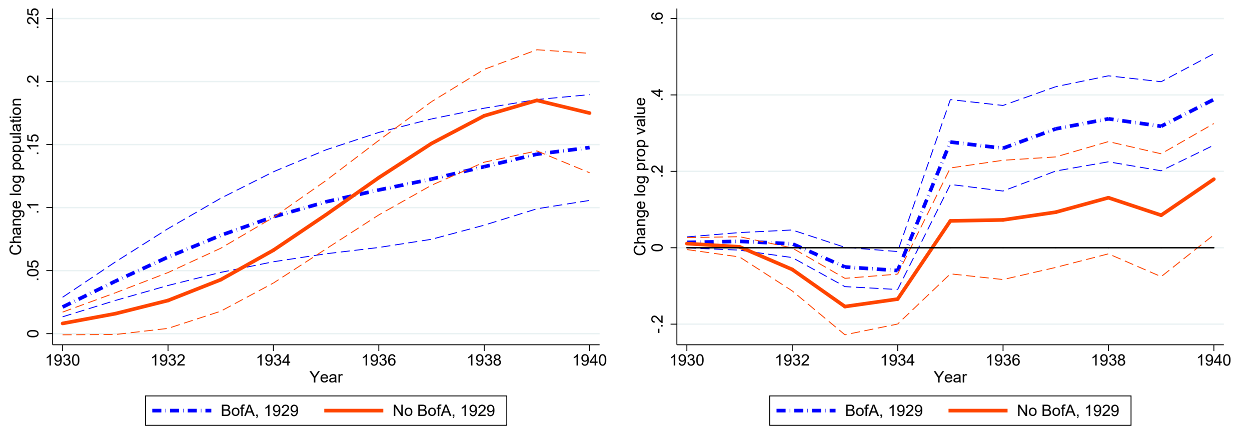
Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), California Board of Equalization (various years), Bleemer (2016), Fishback et al. (2003), and author's calculations. Standard errors clustered at the county level. Thick lines plot the β coefficients from Equation 3 with county-level New Deal spending per capita during the 1930s as an additional control. Thin lines are 90% confidence intervals. Bank treatment assigned based on Bank of America's branch locations in September 1929. In each year, the dependent variable is the log change in economic activity from 1929 to that year.

Figure 14: Adding Additional City and Region Controls



Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), California Board of Equalization (various years),Bleemer (2016), Carlson and Mitchener (2009), and author's calculations. Standard errors clustered at the county level. Thick lines plot the β coefficients from Equation 3 with variables from Equation 1 and region fixed effects as additional controls. Thin lines are 90% confidence intervals. Bank treatment assigned based on Bank of America's branch locations in September 1929. In each year, the dependent variable is the log change in economic activity from 1929 to that year.

Figure 15: Decomposing the Change in Economic Activity

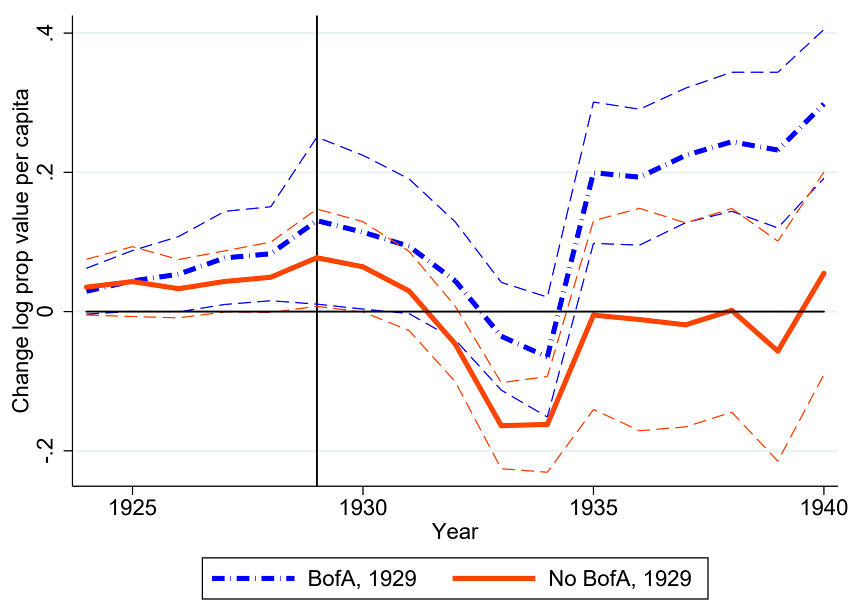


(a) Population Local Projection

(b) Property Value Local Projection

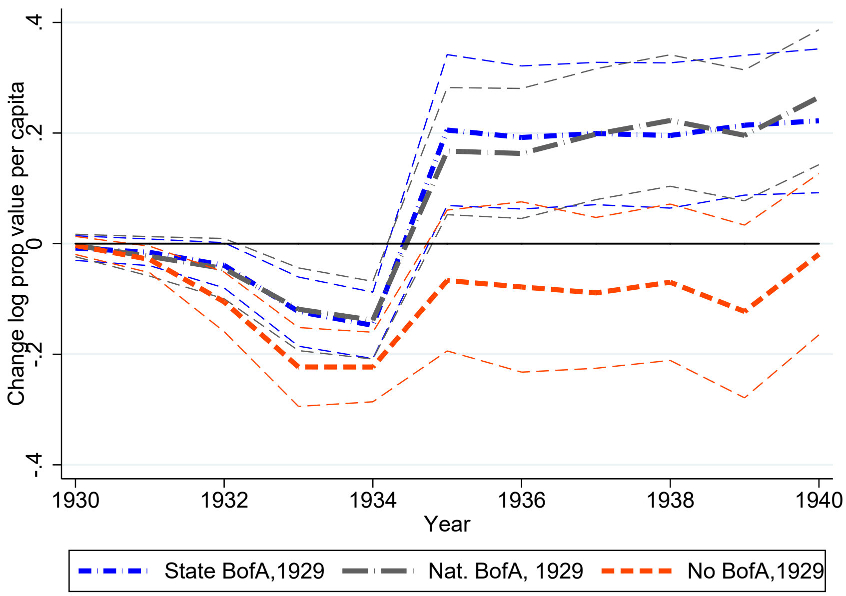
Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Standard errors clustered at the county level. The thick plots the α coefficients from Equation 3 with either population or total property value on the left hand side. Thin lines are 90% confidence intervals. In each year, the dependent variable is the log change in either population or total property value from 1929 to that year

Figure 16: Placebo Estimates of Credit Supply Effects on Economic Activity, 1923–1940



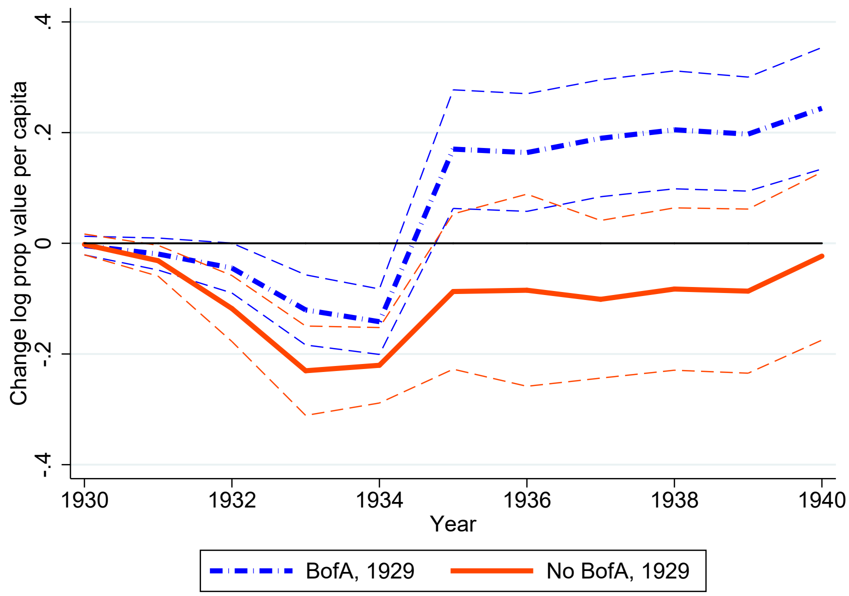
Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Standard errors clustered at the county level. Thick lines plot the β coefficients from Equation 3 beginning in 1923 and thin lines are 90% confidence intervals.

Figure 17: Credit Supply Effects for State versus National BofA Systems, 1929–1940



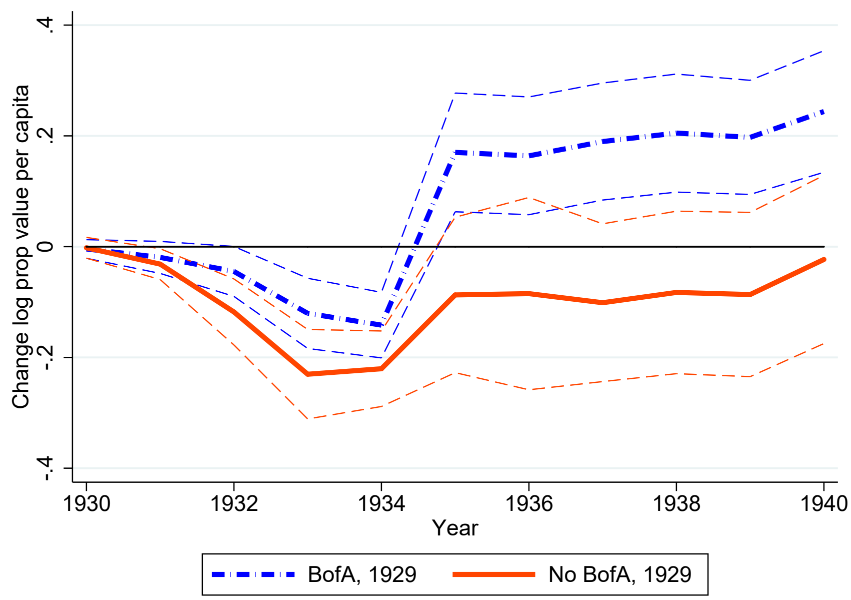
Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Standard errors clustered at the county level. Thick lines plot the β coefficients from Equation 3 for cities separately for state Bank of America-branches, national Bank of America-branches, or no Bank of America branches in 1929 and thin lines are 90% confidence intervals.

Figure 18: Credit Supply Effects for Federal Reserve Member Banks, 1929–1940



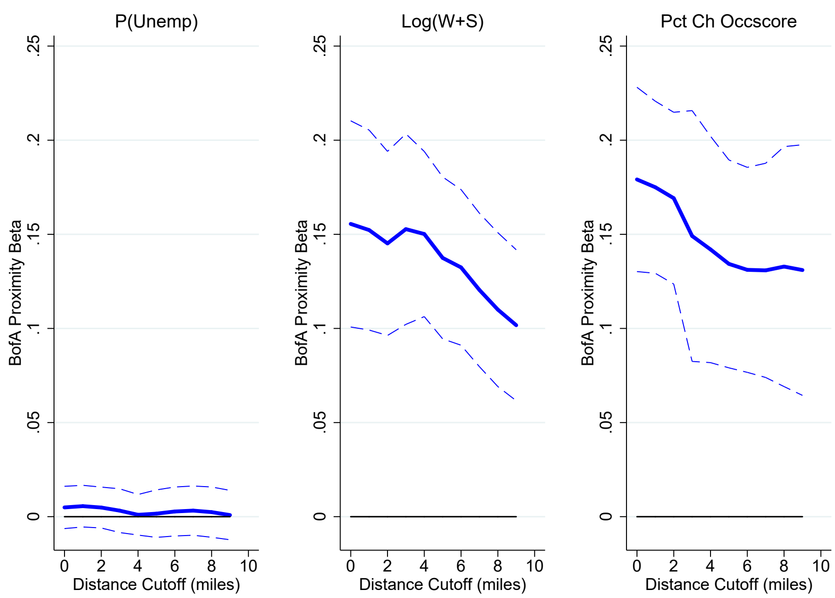
Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Standard errors clustered at the county level. Thick lines plot the β coefficients from Equation 3 for cities either with a Bank of America or other Federal Reserve member bank in 1929 and thin lines are 90% confidence intervals.

Figure 19: Credit Supply Effects for Cities With One Banking Office, 1929–1940



Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Standard errors clustered at the county level. Thick lines plot the β coefficients from Equation 3 for cities with one banking office in 1929, either a Bank of America branch or a unit bank, and thin lines are 90% confidence intervals.

Figure 20: Robustness of Individual Results to Alternative Distance Cutoffs



Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017),Morse et al. (n.d.), and author's calculations. Each y-axis value is the proximity coefficient from a separate regression on the variable listed above the graph as in Equation 7 using the corresponding x-axis value as the distance cutoff. The dashed lines represented 95 percent confidence intervals based on the standard errors from each separately estimated regression.

7.2 Tables

Table 9: Manufacturing Establishment Characteristics Balance Table, 1929

	P(Incorp)	Log Sales	Log Tot Wages	Log Wage Earners
BofA, 1929	0.0280	-0.296*	-0.101	-0.125
	(0.0382)	(0.148)	(0.140)	(0.147)
Mean	0.477	10.518	9.021	4.280
sd	(0.500)	(1.796)	(1.633)	(1.554)
N	659	649	553	531

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years),Bleemer (2016), and Vickers and Ziebarth (2018). All manufacturing establishments in California in Vickers and Ziebarth (2018) included, except those in cities mentioned in the body of the paper. Each coefficient is the result of a regression of the outcome on a dummy for the establishment's city having a Bank of America branch in 1929 and 1929 population. Mean and standard deviation are for the estimation sample. Standard errors are clustered at the county level. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

To compare the effects of Bank of America's presence for a variety of subsamples in a condensed fashion, I estimate the effect of having smaller declines in local loan supply on property value per capita y_{ct} using a first difference specification:

$$\begin{aligned}\log y_{c,1940} - \log y_{c,1929} = \beta_1 BOFA_{c,1929} + \beta_2 NOBOFA_{c,1929} \\ + \gamma X_{c,1929} + \epsilon_{\mathcal{C}c}.\end{aligned} \tag{9}$$

The β coefficients measure the growth rate of real economic activity from 1929 to 1940. Because I drop the constant term, these β coefficients are the average growth rates, conditional on 1929 city-level characteristics, for cities with a Bank of America branch in 1929 (β_1) and those without one (β_2).There is evidence population played a role in Bank of America's location decisions so I control for demeaned 1929 population levels in the baseline. Standard errors are clustered at the county level.

Table 10: 1929–1940 economic growth based on 1930 industry structure

	Services	Trade	Agriculture	Manufacturing
Median Emp. Share, 1930	0.177	0.143	0.084	0.061
A: Above Median				
BofA, 1929	0.195***	0.189**	0.154	0.391***
	(0.0696)	(0.0753)	(0.105)	(0.0825)
No BofA, 1929	0.00566	0.0722	-0.135	0.0117
	(0.102)	(0.0975)	(0.105)	(0.124)
BofA, 1929 - No BofA, 1929	0.189	0.117	0.289	0.379
F-test	2.353	1.124	6.849	8.949
p-value	(0.132)	(0.295)	(0.013)	(0.005)
N	123	122	121	123
B: Below 1930 Employment Share Median				
BofA, 1929	0.318***	0.334***	0.348***	0.114
	(0.0905)	(0.0917)	(0.0903)	(0.0769)
No BofA, 1929	-0.0392	-0.0765	0.101	-0.0365
	(0.117)	(0.105)	(0.134)	(0.0787)
BofA, 1929 - No BofA, 1929	0.357	0.411	0.247	0.150
F-test	7.904	13.318	3.969	2.244
p-value	(0.008)	(0.001)	(0.053)	(0.142)
N	120	121	122	120

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Standard errors, in parentheses, are clustered at the county level. Branch status is of September 1929. F-test and p-value refer to an F-test of equality of BofA and NoBofA coefficients at each horizon. Regressions stratified by median employment in each industry in 1930 as calculated from the share of employed workers in each industry in the 1930 census microdata (Ruggles et al., 2017). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Economic activity growth above median 1923–1929 economic growth

	(1) 1929–1940	(2) 1929–1933	(3) 1933–1940	(4) 1923–1929
No BofA, 1929	-0.0204	-0.224***	0.212***	0.298***
	(0.110)	(0.0553)	(0.0753)	(0.0540)
BofA, 1929	0.264**	-0.125*	0.401***	0.341***
	(0.111)	(0.0641)	(0.0829)	(0.0972)
BofA, 1929 - No BofA, 1929	0.284	0.100	0.190	0.043
F-test	7.591	4.535	6.523	0.716
p-value	(0.009)	(0.039)	(0.015)	(0.403)
N	132	132	138	113

Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Standard errors are clustered at the county level. Sample includes cities with above median economic activity growth from 1923 to 1929. Branch status is of September 1929. F-test and p-value refer to an F-test of equality of BofA and NoBofA coefficients at each horizon. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 12: Economic activity growth below median 1923–1929 economic growth

	(1) 1929–1940	(2) 1929–1933	(3) 1933–1940	(4) 1923–1929
No BofA, 1929	-0.00818	-0.210***	0.202*	-0.114***
	(0.103)	(0.0400)	(0.108)	(0.0286)
BofA, 1929	0.237**	-0.0972***	0.334***	-0.0886**
	(0.0950)	(0.0336)	(0.0927)	(0.0362)
BofA, 1929 - No BofA, 1929	0.245	0.113	0.132	0.026
F-test	6.066	5.703	2.163	0.408
p-value	(0.018)	(0.022)	(0.149)	(0.526)
N	112	112	112	112

Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Standard errors are clustered at the county level. Sample includes cities with below median economic activity growth between 1923 and 1929. Branch status is of September 1929. F-test and p-value refer to an F-test of equality of BofA and NoBofA coefficients at each horizon. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 13: Economic activity growth above 1929 population median

	(1) 1929–1940	(2) 1929–1933	(3) 1933–1940	(4) 1923–1929
No BofA, 1929	-0.0492	-0.270***	0.221*	0.106*
	(0.168)	(0.0573)	(0.129)	(0.0607)
BofA, 1929	0.308***	-0.124*	0.431***	0.154
	(0.110)	(0.0683)	(0.0645)	(0.118)
BofA, 1929 - No BofA, 1929	0.357	0.147	0.210	0.048
F-test	6.029	7.608	3.058	0.271
p-value	(0.018)	(0.008)	(0.087)	(0.605)
N	140	140	140	133

Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Standard errors are clustered at the county level. Sample includes cities with above median population in 1929. Branch status is of September 1929. F-test and p-value refer to an F-test of equality of BofA and NoBofA coefficients at each horizon. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 14: Economic activity growth below 1929 population median

	(1) 1929–1940	(2) 1929–1933	(3) 1933–1940	(4) 1923–1929
No BofA, 1929	-0.251	-0.154**	0.0248	0.116*
	(0.200)	(0.0749)	(0.170)	(0.0628)
BofA, 1929	-0.0987	-0.0706	0.118	0.153**
	(0.175)	(0.0585)	(0.169)	(0.0748)
BofA, 1929 - No BofA, 1929	0.152	0.084	0.093	0.037
F-test	2.458	3.345	1.115	0.302
p-value	(0.124)	(0.074)	(0.297)	(0.586)
N	104	104	110	92

Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Standard errors are clustered at the county level. Sample includes cities with below median population in 1929. Branch status is of September 1929. F-test and p-value refer to an F-test of equality of BofA and NoBofA coefficients at each horizon. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 15: Cumulative Growth in Economic Activity, 1923 to 1940

	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
BofA, 1929	0.029	0.044	0.054	0.077*	0.083**	0.131*	0.114*	0.094	0.044	-0.036	-0.065	0.200***	0.193***	0.225***	0.244***	0.232***	0.298***
	(0.020)	(0.027)	(0.033)	(0.041)	(0.041)	(0.073)	(0.067)	(0.059)	(0.051)	(0.047)	(0.052)	(0.062)	(0.059)	(0.059)	(0.061)	(0.068)	(0.065)
No BofA, 1929	0.034	0.043	0.032	0.044	0.049	0.076*	0.061	0.027	-0.051	-0.169***	-0.169***	-0.015	-0.022	-0.028	-0.007	-0.065	0.047
	(0.023)	(0.030)	(0.025)	(0.027)	(0.030)	(0.042)	(0.038)	(0.033)	(0.034)	(0.039)	(0.044)	(0.088)	(0.102)	(0.094)	(0.093)	(0.099)	(0.092)
BofA-No BofA	-0.005	0.001	0.022	0.033	0.034	0.054	0.053	0.067	0.095	0.133	0.104	0.215	0.215	0.253	0.251	0.297	0.252
F-test	0.144	0.004	1.085	1.657	1.480	1.387	1.445	2.339	4.092	6.580	3.729	4.888	3.626	5.864	5.993	7.316	6.742
p-value	(0.706)	(0.950)	(0.303)	(0.204)	(0.229)	(0.245)	(0.235)	(0.132)	(0.048)	(0.013)	(0.059)	(0.032)	(0.063)	(0.019)	(0.018)	(0.009)	(0.012)
N	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227

Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Standard errors clustered at county level. F-test and p-value refer to an F-test of equality of BofA and No BofA coefficients, plotted in Figure 16 at each horizon. * p<0.1, ** p<0.05, *** p<0.01

Table 16: Cumulative Growth in Economic Activity Using Propensity Score Matching, 1929 to 1940

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
ATE											
BofA - No BofA, 1929	0.023	0.020	0.055	0.093*	0.058	0.169	0.172	0.206*	0.216**	0.232***	0.214**
	(0.019)	(0.027)	(0.047)	(0.055)	(0.062)	(0.124)	(0.111)	(0.106)	(0.098)	(0.088)	(0.106)
N	244	244	244	244	244	244	244	244	244	244	244

Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Abadie-Imben standard errors in parentheses. Bank treatment based on 1929 branch locations. Coefficients plotted in Figure 11b * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 17: Cumulative Growth in Economic Activity, 1923 to 1940 Using Year Branch Opened

	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
BofA in given year	-0.012	-0.011	0.016	0.076	0.088**	0.116	0.103	0.081	0.035	-0.040	-0.067	0.213***	0.195***	0.191***	0.203***	0.150*	0.249***
	(0.012)	(0.017)	(0.029)	(0.046)	(0.042)	(0.072)	(0.067)	(0.057)	(0.052)	(0.047)	(0.051)	(0.061)	(0.057)	(0.064)	(0.066)	(0.085)	(0.074)
No BofA in given year	0.035	0.049	0.045	0.057*	0.052	0.090*	0.072*	0.038	-0.043	-0.165***	-0.170***	-0.043	-0.044	-0.051	-0.026	-0.039	0.039
	(0.022)	(0.029)	(0.027)	(0.030)	(0.031)	(0.046)	(0.040)	(0.037)	(0.034)	(0.038)	(0.043)	(0.085)	(0.102)	(0.095)	(0.098)	(0.097)	(0.091)
BofA-No BofA	-0.046	-0.060	-0.030	0.020	0.036	0.027	0.031	0.043	0.078	0.124	0.103	0.256	0.239	0.241	0.229	0.189	0.210
F-test	4.111	3.312	2.434	0.350	1.540	0.288	0.492	0.873	2.809	6.021	4.140	7.844	5.008	6.497	5.863	2.631	5.646
p-value	(0.048)	(0.075)	(0.125)	(0.557)	(0.220)	(0.594)	(0.486)	(0.355)	(0.100)	(0.018)	(0.047)	(0.007)	(0.030)	(0.014)	(0.019)	(0.111)	(0.021)
N	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227

Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Standard errors clustered at county level. F-test and p-value refer to an F-test of equality of BofA and NoBofA coefficients, plotted in Figure 8, at each horizon. * p<0.1, ** p<0.05, *** p<0.01

Table 18: Economic Growth, 1923 to 1940 using Post-1929 Expansion

	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
BofA, 1929	0.031	0.048*	0.058*	0.082*	0.086**	0.134*	0.117*	0.097	0.048	-0.031	-0.061	0.208***	0.196***	0.229***	0.248***	0.231***	0.302***
	(0.021)	(0.028)	(0.034)	(0.042)	(0.041)	(0.073)	(0.067)	(0.058)	(0.051)	(0.047)	(0.052)	(0.062)	(0.060)	(0.059)	(0.061)	(0.070)	(0.065)
BofA, Post-1929	0.067**	0.108**	0.108**	0.122**	0.105**	0.131***	0.113***	0.091**	0.010	-0.082	-0.087	0.140	0.035	0.059	0.073	-0.090	0.114
	(0.032)	(0.052)	(0.043)	(0.050)	(0.043)	(0.048)	(0.040)	(0.036)	(0.044)	(0.049)	(0.061)	(0.101)	(0.117)	(0.114)	(0.110)	(0.186)	(0.120)
No BofA, 1940	0.021	0.015	0.000	0.009	0.025	0.055	0.043	0.003	-0.071	-0.202***	-0.197***	-0.073	-0.036	-0.058	-0.035	-0.049	0.022
	(0.023)	(0.026)	(0.024)	(0.026)	(0.033)	(0.051)	(0.050)	(0.045)	(0.043)	(0.048)	(0.049)	(0.097)	(0.107)	(0.100)	(0.101)	(0.102)	(0.097)
1929 BofA - Never BofA	0.010	0.033	0.058	0.073	0.061	0.078	0.074	0.094	0.119	0.172	0.136	0.281	0.232	0.287	0.283	0.279	0.280
F-test	0.328	2.160	3.806	3.715	3.090	2.572	2.318	3.575	5.229	8.771	6.244	6.685	3.620	6.413	6.462	5.116	7.405
p-value	(0.570)	(0.148)	(0.057)	(0.060)	(0.085)	(0.115)	(0.134)	(0.065)	(0.027)	(0.005)	(0.016)	(0.013)	(0.063)	(0.015)	(0.014)	(0.028)	(0.009)
Post-1929 BofA - Never BofA	0.046	0.093	0.108	0.113	0.080	0.075	0.070	0.088	0.082	0.120	0.109	0.213	0.071	0.117	0.107	-0.041	0.092
F-test	3.816	3.866	6.322	4.391	2.935	1.625	1.471	2.552	1.883	3.744	2.696	5.344	0.500	1.299	1.126	0.041	0.707
p-value	(0.056)	(0.055)	(0.015)	(0.041)	(0.093)	(0.208)	(0.231)	(0.117)	(0.176)	(0.059)	(0.107)	(0.025)	(0.483)	(0.260)	(0.294)	(0.840)	(0.404)
1929 BofA - Post-1929 BofA	-0.036	-0.060	-0.050	-0.040	-0.019	0.003	0.004	0.006	0.037	0.052	0.026	0.068	0.161	0.170	0.176	0.320	0.188
F-test	4.419	2.636	2.937	1.244	0.249	0.003	0.005	0.013	0.409	0.684	0.132	0.442	1.799	2.128	2.345	3.247	2.470
p-value	(0.041)	(0.111)	(0.093)	(0.270)	(0.620)	(0.960)	(0.942)	(0.911)	(0.525)	(0.412)	(0.718)	(0.509)	(0.186)	(0.151)	(0.132)	(0.078)	(0.122)
N	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224

Sources: Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Standard errors clustered at county level. F-test and p-value refer to an F-test of equality of the indicated coefficients, plotted in Figure 9, at each horizon.
* p<0.1, ** p<0.05, *** p<0.01

Table 19: Growth in Economic Activity Based on BofA Deposit Market Share, 1929 to 1940

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
BofA Market Share	-0.001	0.001	0.025	0.044	0.027	0.096	0.115*	0.120*	0.117*	0.150**	0.109*
	(0.008)	(0.012)	(0.026)	(0.035)	(0.040)	(0.059)	(0.062)	(0.061)	(0.060)	(0.061)	(0.059)
N	205	205	205	205	205	205	205	205	205	205	205

Sources:Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Transamerica Corporation vs Federal Reserve Board (1953), California Board of Equalization (various years), Bleemer (2016), and author's calculations. Standard errors clustered at county level. Market share is standardized to have mean 0 and standard deviation 1. Coefficents plotted in Figure 10. * $p<0.1$, ** $p<0.05$, *** $p<0.01$

Table 20: 1940 log wages based on 1930 occupation structure

	Prof/Mgr.	Farming	Nonfarm Lab.	Sales/Cler.	Craft/Op.	Service
A: Above 1930 Median Employment Share						
Proximity to $BOFA_{1929}$	0.125***	0.132***	0.138***	0.103***	0.145***	0.106***
	(0.0377)	(0.0246)	(0.0275)	(0.0247)	(0.0309)	(0.0380)
R-sq	0.20	0.20	0.20	0.17	0.18	0.19
N	126233	154203	121240	103127	135614	89861
B: Below 1930 Median Employment Share						
Proximity to $BOFA_{1929}$	0.0320	0.125***	0.146***	0.0624***	0.0756**	0.117***
	(0.0293)	(0.0273)	(0.0366)	(0.0214)	(0.0310)	(0.0208)
R-sq	0.19	0.18	0.23	0.19	0.22	0.21
N	101906	73933	106897	125012	92525	138278

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), Morse et al. (n.d.), and author's calculations. Standard errors clustered at 1940 county level. Other explanatory variables in these regressions are 1(white), a quadratic in age, dummies for having an eighth grade education, 1930 marital and rural status, 1930 city of residence population, and fixed effects for 1940 county and 1930 industry and occupation groups. Only men over the age of 16 in 1930 living in California in 1940 included. Proximity is 1 if within five miles of 1929 BofA location in 1940. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 21: 1940 log wages based on 1930 industry structure

	Ag/Mining	Mfg/Cons.	Trans/ Util	Retail/Wholesale	Gov.	Services
A: Above 1930 Median Employment Share						
Proximity to $BOFA_{1929}$	0.140***	0.132***	0.138***	0.102***	0.109***	0.120***
	(0.0213)	(0.0276)	(0.0294)	(0.0180)	(0.0301)	(0.0243)
R-sq	0.21	0.20	0.20	0.20	0.19	0.20
N	191670	157645	165023	126255	95463	167807
B: Below 1930 Median Employment Share						
Proximity to $BOFA_{1929}$	0.100*	0.104***	0.118***	0.0946***	0.120***	0.0248
	(0.0558)	(0.0292)	(0.0382)	(0.0307)	(0.0255)	(0.0410)
R-sq	0.22	0.21	0.22	0.20	0.21	0.18
N	36466	70493	63115	101884	121027	60332

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), Morse et al. (n.d.), and author's calculations. Standard errors clustered at 1940 county level. Other explanatory variables in these regressions are 1(white), a quadratic in age, dummies for having an eighth grade education, 1930 marital and rural status, 1930 city of residence population, and fixed effects for 1940 county and 1930 industry and occupation groups. Only men over the age of 16 in 1930 living in California in 1940 included. Proximity is 1 if within five miles of a 1929 BofA location in 1940. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 22: 1940 employment based on 1930 occupation structure

	Prof/Mgr.	Farming	Nonfarm Lab.	Sales/Cler.	Craft/Op.	Service
A: Above 1930 Median Employment Share						
Proximity to $BOFA_{1929}$	0.0317***	-0.133***	-0.00353	0.0176***	0.0135	0.00642***
	(0.00566)	(0.0267)	(0.00530)	(0.00579)	(0.0108)	(0.00221)
R-sq	0.16	0.23	0.06	0.11	0.15	0.06
N	197636	253321	188391	156324	200264	143326
B: Below 1930 Median Employment Share						
Proximity to $BOFA_{1929}$	0.0141**	-0.0307	-0.000806	0.0192***	-0.00384	0.00998***
	(0.00600)	(0.0191)	(0.00622)	(0.00262)	(0.0154)	(0.00274)
R-sq	0.09	0.27	0.03	0.08	0.12	0.04
N	166705	111017	175948	208017	164077	221015

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), Morse et al. (n.d.), and author's calculations. Standard errors clustered at 1940 county level. Other explanatory variables in these regressions are 1(white), a quadratic in age, dummies for having an eighth grade education, 1930 marital and rural status, 1930 city of residence population, and fixed effects for 1940 county and 1930 industry and occupation groups. Only men over the age of 16 in 1930 living in California in 1940 included. Proximity is 1 if within five miles of 1929 BofA location in 1940. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 23: 1940 employment based on 1930 industry structure

	Ag/Mining	Mfg/Cons.	Trans/Util	Retail/Wholesale	Gov.	Services
A: Above 1930 Median Employment Share						
Proximity to $BOFA_{1929}$	-0.112***	-0.0116	0.00343	0.0222***	0.0102*	0.0225***
	(0.0307)	(0.00790)	(0.00596)	(0.00694)	(0.00573)	(0.00448)
R-sq	0.22	0.10	0.08	0.10	0.10	0.09
N	307880	240859	253970	192406	146266	261896
B: Below 1930 Median Employment Share						
Proximity to $BOFA_{1929}$	-0.0120	0.00154	0.00637*	0.0204***	-0.00150	0.00796*
	(0.0186)	(0.00848)	(0.00376)	(0.00576)	(0.00483)	(0.00448)
R-sq	0.31	0.07	0.04	0.07	0.05	0.06
N	56458	123481	110370	171935	198624	102445

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), Morse et al. (n.d.), and author's calculations. Standard errors clustered at 1940 county level. Other explanatory variables in these regressions are 1(white), a quadratic in age, dummies for having an eighth grade education, 1930 marital and rural status, 1930 city of residence population, and fixed effects for 1940 county and 1930 industry and occupation groups. Only men over the age of 16 in 1930 living in California in 1940 included. Proximity is 1 if within five miles of 1929 BofA location in 1940. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 24: Industrial Employment Shares For 1930 Bank of America Residents, 1940

	Ag/Mining	Mfg/Cons.	Trans/ Util	Retail/Wholesale	Gov.	Services
Sample Sector Emp. Share	0.182	0.296	0.084	0.204	0.045	0.171
A: Overall Effect						
Proximity to $BOFA_{1929}$	-0.0849***	0.00556	0.0135**	0.0400***	0.00999***	0.0298***
	(0.0227)	(0.00797)	(0.00530)	(0.00944)	(0.00204)	(0.00522)
R-sq	0.22	0.15	0.15	0.15	0.11	0.14
N	134787	134787	134787	134787	134787	134787
B: Not In Sector, 1930						
Proximity to $BOFA_{1929}$	-0.0899***	-0.00922	0.00539	0.0228***	0.00633***	0.0145***
	(0.0239)	(0.00566)	(0.00360)	(0.00653)	(0.00162)	(0.00342)
R-sq	0.11	0.06	0.02	0.06	0.01	0.03
N	117139	107125	125442	115172	131471	114066
C: In Sector, 1930						
Proximity to $BOFA_{1929}$	-0.0541**	0.0635***	0.0985***	0.140***	0.148***	0.120***
	(0.0227)	(0.0201)	(0.0203)	(0.0289)	(0.0215)	(0.0210)
R-sq	0.12	0.10	0.11	0.08	0.27	0.10
N	17647	27661	9345	19615	3315	20720

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), Morse et al. (n.d.), and author's calculations. Standard errors clustered at 1940 county level. Other explanatory variables in these regressions are 1(white), a quadratic in age, dummies for having an eighth grade education, 1930 marital and rural status, 1930 city of residence population, and fixed effects for 1940 county and 1930 industry and occupation groups. Only men over the age of 16 in 1930 residing in Bank of America-branched towns in 1929 still living in California in 1940 included. Proximity is 1 if within five miles of 1929 BofA location in 1940. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 25: Occupational Employment Shares For 1930 Bank of America Residents, 1940

	Prof/Mgr.	Farming	Nonfarm Lab.	Sales/Cler.	Craft/Op.	Service
Sample Occ Group Emp. Share	0.246	0.127	0.086	0.133	0.352	0.056
A: Overall Effect						
Proximity to $BOFA_{1929}$	0.0730***	-0.0975***	-0.00535	0.0390***	0.0101	0.0122***
	(0.00802)	(0.0257)	(0.00360)	(0.00642)	(0.0159)	(0.00278)
R-sq	0.08	0.15	0.03	0.04	0.08	0.01
N	161004	161004	161004	161004	161004	161004
B: Not In Occ Group, 1930						
Proximity to $BOFA_{1929}$	0.0473***	-0.0927***	-0.00887***	0.0262***	-0.00560	0.00864***
	(0.00529)	(0.0250)	(0.00277)	(0.00403)	(0.0106)	(0.00205)
R-sq	0.05	0.11	0.02	0.03	0.07	0.00
N	137717	148256	148179	140775	118926	155665
C: In Occ Group, 1930						
Proximity to $BOFA_{1929}$	0.163***	-0.0782***	0.0516***	0.107***	0.0742***	0.115***
	(0.0231)	(0.0230)	(0.0167)	(0.0270)	(0.0270)	(0.0211)
R-sq	0.10	0.12	0.07	0.05	0.09	0.12
N	23286	12747	12825	20229	42078	5338

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), Morse et al. (n.d.), and author's calculations. Standard errors clustered at 1940 county level. Other explanatory variables in these regressions are 1(white), a quadratic in age, dummies for having an eighth grade education, 1930 marital and rural status, 1930 city of residence population, and fixed effects for 1940 county and 1930 industry and occupation groups. Only men over the age of 16 in 1930 residing in Bank of America-branched towns in 1929 still living in California in 1940 included. Proximity is 1 if within five miles of 1929 BofA location in 1940. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 26: Industrial Employment Shares For 1930 non- Bank of America Residents, 1940

Sample Sector Emp. Share	Ag/Mining 0.356	Mfg/Cons. 0.275	Trans/ Util 0.061	Retail/Wholesale 0.146	Gov. 0.034	Services 0.115
A: Overall Effect						
Proximity to $BOFA_{1929}$	-0.114***	0.0119	0.00431	0.0379***	0.00803*	0.0294***
	(0.0289)	(0.0101)	(0.00504)	(0.00946)	(0.00445)	(0.00529)
R-sq	0.21	0.08	0.04	0.06	0.06	0.05
N	229554	229554	229554	229554	229554	229554
B: Not In Sector, 1930						
Proximity to $BOFA_{1929}$	-0.0671***	0.0222**	0.00654	0.0393***	0.00851**	0.0308***
	(0.0246)	(0.00894)	(0.00435)	(0.00902)	(0.00402)	(0.00519)
R-sq	0.13	0.06	0.01	0.04	0.04	0.02
N	147029	190432	215793	209498	225351	209147
C: In Sector, 1930						
Proximity to $BOFA_{1929}$	-0.199***	-0.0324**	-0.0281	0.0239*	-0.0214	0.0165*
	(0.0290)	(0.0136)	(0.0168)	(0.0134)	(0.0284)	(0.00844)
R-sq	0.16	0.09	0.11	0.05	0.21	0.06
N	82525	39122	13760	20056	4201	20407

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), Morse et al. (n.d.), and author's calculations. Standard errors clustered at 1940 county level. Other explanatory variables in these regressions are 1(white), a quadratic in age, dummies for having an eighth grade education, 1930 marital and rural status, 1930 city of residence population, and fixed effects for 1940 county and 1930 industry and occupation groups. Only men over the age of 16 in 1930 not residing in Bank of America-branched towns in 1929 still living in California in 1940 included. Proximity is 1 if within five miles of 1929 BofA location in 1940. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 27: Occupational Employment Shares For 1930 non-Bank of America Residents, 1940

Sample Occ Group Emp. Share	Prof/Mgr. 0.150	Farming 0.276	Nonfarm Lab. 0.115	Sales/Cler. 0.084	Craft/Op. 0.324	Service 0.052
A: Overall Effect						
Proximity to $BOFA_{1929}$	0.0460***	-0.117***	0.00324	0.0298***	0.0180	0.0166***
	(0.00547)	(0.0335)	(0.00673)	(0.00603)	(0.0198)	(0.00428)
R-sq	0.06	0.18	0.04	0.05	0.09	0.01
N	261018	261018	261018	261018	261018	261018
B: Not In Occ Group, 1930						
Proximity to $BOFA_{1929}$	0.0485***	-0.0734***	0.00571	0.0302***	0.0281*	0.0169***
	(0.00488)	(0.0261)	(0.00624)	(0.00465)	(0.0164)	(0.00365)
R-sq	0.06	0.13	0.03	0.04	0.08	0.01
N	239889	186635	235275	242493	207130	253887
C: In Occ Group, 1930						
Proximity to $BOFA_{1929}$	0.0107	-0.223***	-0.0213*	0.0158	-0.0158	0.00283
	(0.0104)	(0.0304)	(0.0112)	(0.0161)	(0.0221)	(0.0193)
R-sq	0.10	0.18	0.06	0.07	0.09	0.07
N	21129	74383	25743	18525	53888	7130

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), Morse et al. (n.d.), and author's calculations. Standard errors clustered at 1940 county level. Other explanatory variables in these regressions are 1(white), a quadratic in age, dummies for having an eighth grade education, 1930 marital and rural status, 1930 city of residence population, and fixed effects for 1940 county and 1930 industry and occupation groups. Only men over the age of 16 in 1930 residing in Bank of America-branched towns in 1929 still living in California in 1940 included. Proximity is 1 if within five miles of 1929 BofA location in 1940. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

8 Property Values

8.1 Background

Starting in 1910, California split tax bases for state and local governments.[51] The state assessed and taxed public utilities, personal property of banks and insurance companies, corporation franchise value, and large vessels. County governments assessed and taxed everything else held by households and firms, including land, improvements, money and other personal tangible property, and intangible assets like stocks and bonds. Each county hired between 500 and 1,800 employees every year to visit each property at least once between March and July (California Board of Equalization (various years), 1929 p123). Assessed property value included personal ownership of stocks and bonds as well as all land and structures owned by households and businesses, aside from banks, utilities, and railroads.

Each year, the county appraiser's office was responsible for revising its assessments of each parcel of land within the county. Every property in the county was visited each year in order to fix its value for taxation by the county as of the first Monday in March (California Board of Equalization (various years), 1922 p76). Using zoning restrictions on property use, neighborhood meetings, lease and mortgage contracts, sales and rental prices, economic geography concepts like access to commerce and transportation, lot size and shape, topography, and visits to each parcel, the appraisal office would ascertain the value of each parcel. Preliminary values were often modifications of sales prices of similar properties in that year based on these characteristics. The county appraiser would go over each parcel himself before finalizing the assessment for each parcel in each year (California Board of Equalization (1945) p149).[52]

[51] This split occurred because county assessors struggled to assign the value of railroads to individual localities.

[52] In the 1921–1922 Board of Equalization report, it states that a deputy assessor listed and valued each property in his district of the county but was still subject to the chief assessor's approval. (California Board of Equalization (various years), 1922 p75)

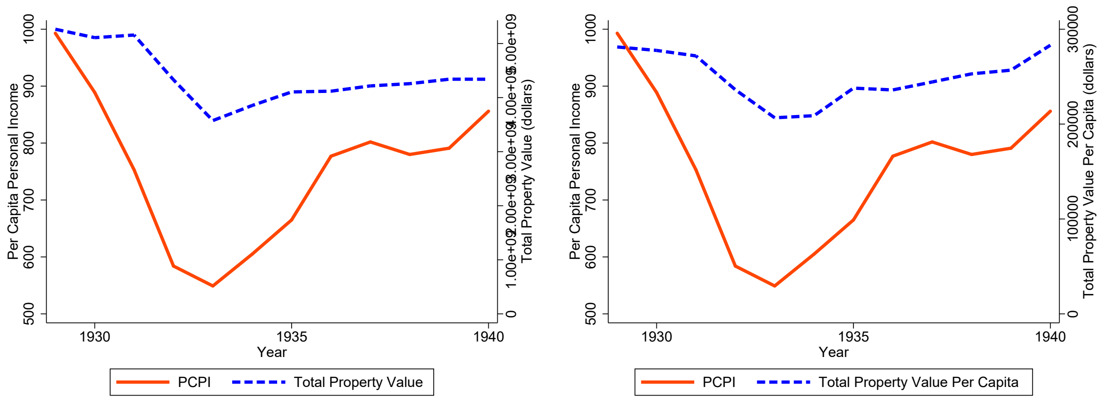
8.2 Assessment Quality

Due to political wrangling over the quality of county assessments in the early 1920s, the California Board of Equalization supervised county assessors closely. The state sent its own assessors to a different sample of properties in each county every year, beginning in 1922 (California Board of Equalization (various years), 1930 p15). Starting in 1924 the state started equalizing values between and within counties. The state would compare the assessed value of selected properties all over the state, in incorporated and unincorporated areas, to state employee appraisals, probate values, and sales prices in every biennial report, and publish equalization values for each city, county, and year. In the 1920s and 1930s, the average ratio of assessed to market value hovered between 40 and 50 percent. In addition, these property valuations formed the basis for county expenses, including all school funding until 1934 (California Board of Equalization (various years), 1930 p8). County assessment offices were therefore under substantial local and state pressure to measure property values fairly and precisely.

The high premium placed on assessment accuracy makes it a good measure of local economic activity. More specifically, assessors' handbooks mention that business income should be part of the property's assessed value (California Board of Equalization (1945) p15). In the case of residential parcels, market value was the focus. To check whether these assessments add up to a coherent measure of economic activity, I compare the annual total incorporated property value in California each year to the state per capita personal income for each year from 1929 to 1940.[53] Figure 21a plots both series. The correlation between total property value and per capita personal income is 0.74. These series appear to move together fairly well during the 1930s. Per capita property value moves even more closely with per capita personal income. These series, plotted in 21b, have a correlation of 0.86. Together, these pieces of evidence suggest that property value is a natural analogue in this period to personal income per capita, but is instead available at the city level.

[53]Per capita personal income is the only state-level income measure available in this period. It is available from 1929 to 1940. Property values were not consulted in the construction of personal income figures, according to Bureau of Economic Analysis documentation (Schwartz and Graham, 1956).

Figure 21: Total California Economic Activity Compared to Per Capita Personal Income



(a) Total Property Value (b) Property Value Per Capita

Source: Banking reports, BEA, California Board of Equalization (various years), and author's calculations.

8.3 Annual Series Construction

Two city-level annual series constitute the components for my measure of local economic activity: population and total property value. In order to control for changes in city borders, I use total property value per capita in my preferred specifications. Figure 15 demonstrates that property value, not population, drives my results. There are roughly 250 incorporated cities included in my dataset in every year. I exclude the largest cities in California due to identification concerns.

City-level annual population data come from California Board of Equalization reports digitized by Bleemer (2016). Decennial values are from the census, and in other years, the state wrote letters to county assessment boards to solicit estimates. In order to correct for city population estimate error, Bleemer (2016) fits a high-order polynomial to the data he collected, weighting census years more heavily. Total property value includes all structures, machinery, and landholdings owned by households and nonfinancial and non-utility companies in incorporated cities until 1934. Then I use total property value, which includes stock and bond holdings, due to a change in what was reported, and continue to exclude property held by utilities and banks. To ensure continuity, I constructed a ratio in 1933 and 1934 of real estate to total property value for each city and multiply all pre-1933 years by this ratio.[54] Given more time, I could also input the total property value for each city in years

[54]In effect, this fixes the ratio of real estate to total property value, which includes stocks and bonds, at

prior to 1933. Finally, I define local economic activity in a town for a given year as the total property value divided by the population of that city.

9 Banking Variables

There are balance sheet and location aspects to the banking panel dataset I collected. I digitized location, assets, loans, and deposits for every bank in California in 1934 from California State Banking Department (various years) (state banks) and Office of the Comptroller of the Currency (various years) (national banks), building on the data collected by Carlson and Mitchener (2009) for 1922 and 1929. Using Board of Governors of the Federal Reserve System (1928), I digitized assets, deposits, loans, surplus, profits, government bond holdings, other security holdings for the state of California from 1919 to 1940.[55] I also collected these balance sheet items for the Bank of America, and its component banks before 1930, from 1904 to 1940.[56]

The Annual Report of the Superintendent of Banks list the location of each unit bank acquired by a branch bank and each banking office opened, as well as the date of these transactions, throughout the entire period of analysis if at least one of the banks involved was a state bank. The Annual Report of the Comptroller of the Currency only does this in 1927 for branches entering the national bank system.[57] Therefore, I use the 1929 and 1934 editions of Polk's Banking Encyclopedia to detail branch locations of both national

a two-year average for each city.

[55]From 1934 to 1940, all investments other than US government securities also includes obligations of the Reconstruction Finance Corporation, Home Owner's Lending Corporation, and Federal Housing Administration. Government bonds include only direct obligations of the federal government and bonds guaranteed by the federal government in terms of both interest and principal. In 1928, the Office of the Comptroller of the Currency only reported surplus plus profits for its individual bank reports, and from 1938 to 1940 included reserves with profits. The state bank reports include profits and reserves from 1930 to 1935, when the last part of the Bank of America state system nationalized.

[56]During the 1920s, A.P. Giannini started several other banks besides the Bank of Italy to accumulate branch offices and evade regulatory discrimination. These banks merged starting in 1928, with the majority of the consolidation done by 1930, when the Bank of Italy becomes the Bank of America National Trust and Savings Association. The final subsidiary became part of the Bank of America NT & SA in 1934 (James and James, 1954). I collect balance sheet, merger, and location information for all of these banks over the entire period.

[57]Until the passage of the McFadden Act in 1927, national banks were prohibited from branching. With the passage of the McFadden Act, national banks were subject to the same branch restrictions as their state bank competitors. Because branch banking was legal in California, national banks could branch, beginning in 1927.

and state banks. In order to capture the changes in branch banking during the 1930s, I use the information I collected from Transamerica Corporation vs Federal Reserve Board (1953). Board exhibit 257 lists total deposits in each city, as well as the deposits held by the Bank of America in 1924, 1926, 1928, 1933, 1935, and 1937 and the method (e.g. *de novo* versus converted unit bank) and date of the Bank of America's entry into each city's banking market. Board exhibits 308, 314-I, 315-I, and 316-I do the same for the other large branch networks in California in the same period (Security-First Trust, Anglo California National Bank, Citizen's National Trust and Savings Bank, and the American Trust Company and their predecessors), ensuring that I know the location and size of each branch of each bank in every year. In the court hearings, the Federal Reserve notes the origin of these city-level data. In order to test whether the Bank of America was monopolizing deposits in the cities in which it operated, clerks at the Federal Reserve Bank of San Francisco during the late 1940s looked up the value of deposits for every bank in every city in the above years. For Federal Reserve member banks, they used call reports in the Federal Reserve Bank of San Francisco archives. They checked these data with FDIC, Office of the Comptroller of the Currency, and California State Banking Department records for member banks. They also used state bank call reports courtesy of the California State Banking Department for non-member, non-FDIC insured banks. Branch and unit bank openings and closings came from a Federal Reserve Board catalog of banking changes and were verified using call reports and local newspaper reports (Transamerica Corporation vs Federal Reserve Board, 1953).

These court hearings also provide me with a time-consistent measure of banking offices, total banks, loans, and deposits in the state of California and the Bank of America system. The Annual Report of the Superintendent of Banks reports on June 30 each year, while the Annual Report of the Comptroller of the Currency published balance sheets as of December 31. Board exhibit 13 lists each of the above variables on December 31 annually from 1924 to 1940, which eliminates the possibility of a state branch becoming part of the national system in the second half of the year and getting double counted. Wherever possible, I use these consistent measures to contrast the Bank of America and all other California banks (defined as the California total minus the Bank of America total for each observation).

With these bank balance sheet data in hand, I construct city aggregates. I use the procedure below to find the universe of possible places for banks to operate. Then, I merge in any possible name changes or consolidations for city names. Therefore, I create city-level totals of each bank balance sheet item for unit banks, and for deposits, banking offices.[58]

10 Geographic Standardization

There are two aspects to capturing city-level variation correctly in this setting. First, I construct a database of all inhabited places in California from 1920 to 1940 to ensure the entire state is part of the analysis. Second, I geocode all of these places, as well as enumeration districts in 1930, because there is a substantial spatial aspect to banking in this period.

10.1 Inhabited Places

I construct a list of all inhabited places in California in 1930. I capture all incorporated cities using the complete count restricted-use 1930 census available on the NBER server (Ruggles et al., 2017). Specifically, I kept all combinations of county and both the stdcity and us1930d_0057 variables. Unlike, say, Massachusetts, large portions of California's population and geography was in unincorporated areas.[59] The 1930 census enumeration forms included a field for unincorporated place which was not digitized by Ancestry. According to the enumerator instructions, any place or village with more than 500 inhabitants was to be enumerated separately from the rest of the enumeration district (Bureau of the Census, 1930). Enumerators were supposed to ask each household if they lived in said place if the boundaries of the unincorporated town was uncertain. I then looked up all 30,388 census returns which had no value for stdcity or us1930d_0057 in the complete count data on Ancestry.com. 8.439 enumeration sheets contained an entry in the unincorporated place field which was both legible and not institutional housing. If the enumerator did not follow instructions and

[58]There are several banks that take as their city of operation the minor civil division in which they operated because there is no unincorporated or incorporated place corresponding to their locations. I geocode these locations using the latitude and longitude of the corresponding enumeration district.

[59]Even in 2016, 65% of the land and 10.3% of the population in Los Angeles County are unincorporated (Southern California Association of Governments, 2017). State Chamber of Commerce (1928) published estimated populations for unincorporated places in 1928 and finds similarly large concentrations of people in unincorporated areas.

listed multiple unincorporated places on one sheet, I transcribed the location which covered the majority of the individuals enumerated.[60]. I take the union of these transcribed places and incorporated cities as the universe of inhabited places in California in 1930.

In order to measure variables in the 1920 and 1940 censuses for these locations, I conduct two more standardization procedures. First, I looked up all possible name changes and consolidations in Durham (1998) for my list of possible 1930 locations over the 1920–1940 period. Name changes, like Sisson being renamed Mount Shasta City, were straightforward. In the case of consolidations, for example Venice Beach becoming part of the city of Los Angeles, I use the larger geographic unit for the entire period. For unincorporated places in 1930 which are an entire enumeration district, I convert the 1930 enumeration district to the 1920 and 1940 equivalents using Morse et al. (n.d.). These two steps give me a crosswalk for all inhabited places in California from 1920 to 1940. I construct city-level aggregates for a variety of census variables by collapsing the individual-level data from the 1920–1940 Censuses to the inhabited place level.

10.2 Geocoding

With this list of localities in hand, I next construct the spatial aspect of the city-level data. I take the shapefiles for census-designated places using the 2008 Tiger/Line+ 2010 Census boundaries available through Minnesota Population Center (2016). Then, using QGIS, I convert these into point files with each point representing the center of each place's modern boundary. Minnesota Population Center (2016) recently made available point files for incorporated and unincorporated places based on historical Census Bureau maps beginning with the 1930 census. There are some missing points in their maps but my point files and theirs overlap, which indicates that modern centroids are a good proxy for historical ones.

Not every historical locality has a corresponding modern census-designated place. In those cases, I use Durham (1998) to check for post-1940 city consolidations (e.g. the formation of Rancho Cucamonga from Cucamonga, Alta Loma, and Etiwanda in 1977) or name changes. If there is a post-1940 correspondent to the consolidated or name-changed place, I

[60] The enumerators in San Bernardino County often combined places into one sheet, so in that case, I transcribed the location for each place along with the line references for its residents

use those coordinates. In the case that a locality still does not have a latitude and longitude, I use the coordinates listed in Durham (1998) where possible. If there still is not a match, I looked up each location by hand in Federal Writing Project (n.d.), and used United States Geological Survey GNIS to find coordinates.

Finally, I geocode the rural parts of California at the enumeration district level. For all enumeration districts which are not subsumed by a locality already geocoded, I find the center of each district using the enumeration district maps available through NARA and the enumeration district descriptions available through Morse et al. (n.d.) by hand. For a typical enumeration district, I use the 1940 map, because it is higher quality than the 1930 map, to identify settlements and natural landmarks which correspond to locations in Google Maps. Given these geocoded points, I then triangulate the center of the enumeration district in 1930.[61].

I also use the enumeration district crosswalks I scraped from Morse et al. (n.d.) to convert enumeration districts in 1930 to their 1920 and 1940 equivalents. The restricted-use version of the complete count censuses include enumeration district. According to the procedural history of the 1940 census, enumeration districts, like the more modern census tract, were designed to follow ward and municipality boundaries when possible, and rivers, roads, and railroads otherwise. Each district had to be enumerated by one person in two weeks, so the population of each district was capped at 1,500 people or 250 farms (Jenkins, 1983). When possible, the 1940 census used the same districts as the 1930 census (Jenkins, 1983). I use 1930 population as weights for each 1930 enumeration district that is a component of either a 1920 or 1940 district to construct the weighted average of the 1930 districts which match up to each 1920 or 1940 district as in Aaronson et al. (2019).

11 Individual-Level Data

Below, I describe several aspects of the longitudinal data used in this paper. First, I compare a variety of observable characteristics at the city level which I have aggregated up from the

[61]Most counties' 1940 enumeration district maps use the 1937 highway survey maps as a basis, but Fresno, Glenn and Lassen Counties' 1930 and 1940 maps either could not be located by the UC Davis map librarians or the boundaries are not legible on the NARA scans.

individual level as detailed above. Next, I review the automated linking process used to generate the dataset. Then I discuss the robustness of this process and the potential biases matching creates in my work. Finally, I define in greater detail the variables used as covariates and dependent variables in the main regressions.

11.1 City Balancing Tables

For the identification strategy used in this paper to be valid, cities' characteristics cannot vary based on Bank of America's branch locations in ways which would drive the size of the credit supply shock. If Bank of America branches were systematically exposed to less-severe economic conditions due to a smaller tradable sector, for example, then the effect associated with Bank of America's presence would be misidentified. Table 3 demonstrates that 1922 demographic, financial, and economic variables fail to predict whether or not Bank of America would open a branch in a given location. Ideally, I would be able to measure every characteristic which may affect economic growth during a recession. In this section, I discuss a variety of observable city characteristics in 1920 and 1930 and whether they vary based on Bank of America's presence in 1929. These balance tests provide support for the baseline identification strategy: Bank of America's branch network was quasi-randomly distributed. Any unobservable characteristic correlated with Bank of America's network in 1929 and economic growth in the 1930s must be uncorrelated with each of the following variables. Because population did correlate with Bank of America's network locations in Table 3, I control for the level of population in each balance test, and in all empirical work in the paper. Specifically, I run a regression for every city-level variable for city c in census year t and county $\mathcal{C}$ of the form:

$$Y_{ct} = \alpha_0 + \beta BofA_c, 1929 + POP_{ct} + \epsilon_{\mathcal{C}ct}. \tag{10}$$

The following tables present balancing tests for a variety of 1920 and 1930 traits based on Bank of America's branching network in 1929. Each column reports the β coefficient from estimating Equation 10 with the given variable on the left hand side, as well as the mean and standard deviation of that variable for all cities in California. β is 1 for a city if it was within five miles of a 1929 Bank of America branch. Standard errors are clustered at the county level. For example, Appendix Table 31 uses t- tests to compare the similarity of demographics in 1930 between the treated and control samples. In particular, the 1920 balancing tables indicate that there was minimal selection of cities into the Bank of America branch network during the 1920s based on 1920 observables, confirming that treatment assignment was quasi-random. The 1930 balancing tables demonstrate that even after the spread of Bank of America, at the start of the Great Depression, treatment is uncorrelated with economic and demographic characteristics. Altogether, these balancing tables complement the evidence on lack of selection presented in the main body of the paper.

Due to the paucity of annual city-level variables in this time period, balancing tests across 1920 census variables are the closest possible analog to traditional pre-trends analysis for a wide range of observables. To measure the effect of Bank of America branch status on economic growth, there cannot be a latent variable connected to later economic growth which drove Bank of America to open a branch in a given town. This theoretical latent variable would have to be uncorrelated with any observable variable which is balanced across treatment status. The more observable characteristics for which means are balanced, the less likely that this confounder exists. Thus, a balanced panel of 1920 characteristics confirms the assumption that Bank of America branch assignment was as good as random.[62] All of the t-tests in Appendix Table 28 are statistically insignificant at conventional levels except literacy and percent white, but the β coefficients are small relative to the mean.[63] Results in Appendix Table 29 indicate non-branched places were more likely to have clerical workers in 1920 but all other occupations were well-balanced. Industrial employment tests, displayed in Appendix Table 30, fail to reject the hypothesis that Bank of America-branched locations and non-Bank of America-branched locations had identical industrial composition aside from

[62] I use only incorporated cities in the 1920 analysis. This drops 139 unincorporated cities which had a median population in 1930 of 314 people. One-third of these cities were within 5 miles of a Bank of America branch. Due to California's rapid population growth in the 1920s, the 1920 enumeration districts are much more spatially aggregated than the 1930 enumeration districts, so I lose 400 1930 unincorporated places in the match backwards to 1930. To be more geographically consistent with the 1930 population distribution, I only present incorporated city results for 1920.

[63] $OCCSCORE$ measures the median earnings for each occupation in 1950. California's earnings distribution followed the national averages. It is the commonly-used measure of occupational standing before 1940, despite having some measurement problems (Olivetti and Paserman, 2015).

a small difference in trade.

Identification also requires that until 1929, Bank of America towns were indistinguishable from non-branched towns. If the presence of a bank branch affected the city before the onset of the financial crisis, then the effects of Bank of America's presence during the Great Depression are a mixture of pre-1929 financial development and loan supply post-1929. Another concern would be that another shock occurred during the 1920s which affected growth in the 1930s. Other evidence in this paper suggests that 1920s property values evolved similarly regardless of branch status. In this section, I present additional evidence of balance in observable characteristics. Therefore, any violation of the identification assumption based on selection on unobservables would require the unobservable variable which drives economic growth in the 1930s be uncorrelated with the observables in these tables. In 1930, cities with Bank of America branches are slightly whiter and have slightly more homeowners but are otherwise similar to other cities in California, as demonstrated in Appendix Table 31. As in the case of property values for the entire city, t-tests cannot reject that average price-rent ratios are the same in treated and control places. In fact, in 1930, differences in the occupational distribution were small, as seen in Appendix Table 32. Bank of America-branched locations had slightly larger clerical worker shares, but this difference is small relative to the standard deviation. All other sectors are statistically indistinguishable based on Bank of America locations. Because population may reflect the size of aggregate demand, I also present results on the industrial structure of California cities based on employment shares in Appendix Table 33. At the onset of the Great Depression, the transportation and utilities sector was smaller and the service sector was larger in Bank of America branched cities, but these differences are all under one-quarter of a standard deviation, indicating that these industries, and all other industry sectors, were similar in treated and control sectors. Other sectors were similarly sized regardless of the financial environment, indicating the validity of the identification strategy.

Table 28: 1920 Demographics Balancing Table

	White	Employed	Occscore	In Labor Force	Literate
BofA, 1929	0.0125*	0.00879	0.460	0.00339	0.0163*
	(0.00667)	(0.0125)	(0.339)	(0.0120)	(0.00884)
Mean	0.968	0.311	7.356	0.400	0.783
sd	(0.039)	(0.060)	(1.460)	(0.058)	(0.054)
N	204	204	204	204	204

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), California Board of Equalization (various years), and Morse et al. (n.d.). Sample includes all incorporated cities in this census except those mentioned in the body of the paper. Each coefficient is the result of a separate regression of the given variable on log population and a Bank of America in 1929 dummy. Mean and standard deviation are for the estimation sample. Standard errors are clustered at the county level. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table 29: 1920 Occupation Employment Balancing Table

	Prof./Mgr.	Farm	Nonfarm Lab.	Cler./Sale	Craft/Op.	Service
BofA, 1929	0.0103	-0.00886	0.000667	0.0133*	0.00363	-0.0191
	(0.0120)	(0.0271)	(0.0182)	(0.00769)	(0.0229)	(0.0122)
Mean	0.182	0.173	0.145	0.126	0.285	0.088
sd	(0.066)	(0.152)	(0.092)	(0.051)	(0.122)	(0.070)
N	204	204	204	204	204	204

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), California Board of Equalization (various years), and Morse et al. (n.d.). Sample includes all incorporated cities in this census except those mentioned in the body of the paper. Each coefficient is the result of a separate regression of the given variable on log population and a Bank of America in 1929 dummy. Mean and standard deviation are for the estimation sample. Standard errors are clustered at the county level. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table 30: 1920 Industry Employment Balancing Table

	Manuf./Con.	Ag./Mining	Trans./Util.	Trade	Services	Government
BofA, 1929	0.0295	-0.0332	0.00966	0.0176**	-0.00818	0.00680
	(0.0444)	(0.0315)	(0.0192)	(0.00760)	(0.0185)	(0.00421)
Mean	0.462	0.223	0.092	0.139	0.234	0.020
sd	(0.242)	(0.172)	(0.098)	(0.052)	(0.102)	(0.050)
N	204	204	204	204	204	204

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), California Board of Equalization (various years), and Morse et al. (n.d.). Sample includes all incorporated cities in this census except those mentioned in the body of the paper. Each coefficient is the result of a separate regression of the given variable on log population and a Bank of America in 1929 dummy. Mean and standard deviation are for the estimation sample. Standard errors are clustered at the county level. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table 31: 1930 Demographics Balancing Table

	White	Employed	Occscore	Pct Homeowner	Price-Rent Ratio
BofA in 5 Miles	0.0353**	-0.0150	-0.279	0.0602***	-0.0283
	(0.0171)	(0.00985)	(0.247)	(0.0172)	(1.583)
Mean	0.879	0.385	8.674	0.500	14.607
sd	(0.167)	(0.082)	(2.151)	(0.163)	(12.658)
N	597	597	597	597	597

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), California Board of Equalization (various years), and Morse et al. (n.d.). Sample includes all places in this census except those mentioned in the body of the paper. Each coefficient is the result of a separate regression of the given variable on log population and a Bank of America in 1929 dummy. Mean and standard deviation are for the estimation sample. Standard errors are clustered at the county level. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table 32: 1930 Occupation Employment Balancing Table

	Prof./Mgr.	Farm	Nonfarm Lab.	Cler./Sale	Craft/Op.	Service
BofA in 5 Miles	0.00975	0.00869	-0.0218	0.0164**	-0.0205	0.00598
	(0.00884)	(0.0227)	(0.0142)	(0.00816)	(0.0129)	(0.00457)
Mean	0.156	0.186	0.125	0.097	0.212	0.071
sd	(0.078)	(0.182)	(0.108)	(0.057)	(0.116)	(0.050)
N	597	597	597	597	597	597

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), California Board of Equalization (various years), and Morse et al. (n.d.). Sample includes all places in this census except those mentioned in the body of the paper. Each coefficient is the result of a separate regression of the given variable on log population and a Bank of America in 1929 dummy. Mean and standard deviation are for the estimation sample. Standard errors are clustered at the county level. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table 33: 1930 Industry Employment Balancing Table

	Manuf./Con.	Ag./Mining	Trans./Util.	Trade	Services	Government
BofA in 5 Miles	-0.00785	-0.0149	-0.0177*	0.00561	0.0274**	-0.0000231
	(0.0158)	(0.0243)	(0.00924)	(0.00768)	(0.0123)	(0.00112)
Mean	0.144	0.236	0.068	0.115	0.170	0.015
sd	(0.119)	(0.192)	(0.084)	(0.065)	(0.089)	(0.023)
N	597	597	597	597	597	597

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), California Board of Equalization (various years), and Morse et al. (n.d.). Sample includes all places in this census except those mentioned in the body of the paper. Each coefficient is the result of a separate regression of the given variable on log population and a Bank of America in 1929 dummy. Mean and standard deviation are for the estimation sample. Standard errors are clustered at the county level. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

11.2 Linking Process

In order to follow people across the Great Depression decade, I use the iterative matching algorithm developed in Abramitzky et al. (2012). That is, I take a 1930 census record and 1940 census record as matched if they report the same birth state, NYSIIS-standardized first and last names, and have birth years within five years of each other. Then I keep only those observations which are unique by first name, last name, and birth place within a five-year birth year window to ensure that the matches are unique and maximize the probability that I have indeed found the same person in both censuses. I assign Bank of America treatment if the person lived within five miles of a Bank of America branch in 1940. [64]

First, I keep only male California residents in 1940 who are between 25 and 65. Then, for both the 1940 dataset and the 1930 possible matches, which includes men living anywhere in the United States between ages 15 and 55, I use the NYSIIS algorithm to standardize first and last names phonetically (Atack et al., 1992). Then, I clean nicknames to match full names as in Abramitzky et al. (2012). My matching criteria are standardized first and last name, state or country of birth, and self-reported age in years. A 1930 observation and 1940 observation are taken as matched only if they are the same on each of these variables. If only one 1930 observation matches only one 1940 observation, I take those records as linked and remove them from the pool of possible matches. Then, I repeat this procedure but allow the ages to be within plus or minus a year of each other, instead of an exact match. Again, I save the unique matches and remove them from the potential matches. Finally, I repeat the matching procedure for an age band of plus or minus two years and keep only the unique matches. Any unlinked record is discarded. This results in a match rate of 43 percent, which is higher than the typical match rate for this method. This may be because I am only matching men across a ten-year period, so the probability of exiting the dataset is low. As a baseline, I have 385,797 observations out of 904,552 possibles.

This matching process introduces some selection concerns. Using names as a basis for

[64] For those living in a census-designated place, I measure the distance as the crow flies from the center of place to the center of the place with the nearest Bank of America branch. For everyone else, I geocoded the centroid of their enumeration district and then calculate the distance (in miles) to the center of the nearest place with a Bank of America branch. Bank of America branches appear in both incorporated and unincorporated cities. In the case of enumeration districts with maps that make it clear that only one part of the enumeration district is habitable, I geocoded the center of that part.

matching reduces the likelihood of finding non-white or common names, for example. Because I require each individual to be in California in 1940, men from farway, less-populous birth states have a smaller pool of potential duplicates. If these men are not representative of the larger California population, e.g. they were positively selected migrants, then birthplace also introduces bias. In Appendix Table 34, I run a series of balance tests for demographic characteristics of men ages 25 to 65 who were enumerated in California in 1940. Each coefficient is the result of a regression of the dependent variable on a dummy variable for being matched and cluster the standard errors on the 1940 county level. The sample size, standard deviation, and mean for all men in the possible match pool are also listed. As hypothesized, the matched sample is whiter, more urban, and higher-earning than the non-matched sample. Men living within five miles of a 1929 Bank of America branch in 1940 are also slightly more likely to be matched. However, these differences are small relative to the mean and variance of each characteristic and the other differences noted here are balanced across a match dummy within the Bank of America treated and control groups.

Table 34: 1940 Overall Match Balance Table

	Pct White	Age	Occscore	W/S Income	Pct Own Home	Farmer	Married	Urban	In CA, 1935	BofA Proximity
Matched	0.0506***	0.455***	2.234***	66.98***	0.0664***	0.00467	0.0774***	0.0356***	0.0144***	0.0349***
	(0.0101)	(0.0695)	(0.131)	(12.53)	(0.00635)	(0.00490)	(0.00752)	(0.00726)	(0.00222)	(0.00613)
Mean	0.951	42.378	21.833	1229.643	0.469	0.085	0.735	0.372	0.832	0.503
sd	(0.215)	(11.296)	(12.822)	(1381.343)	(0.499)	(0.279)	(0.441)	(0.483)	(0.374)	(0.500)
N	904552	904552	904552	904552	904552	904552	904552	904552	904552	904552

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), California Board of Equalization (various years), and Morse et al. (n.d.). Sample includes all places in this census except those mentioned in the body of the paper. Each coefficient is the result of a separate regression of the given variable on a dummy for being matched to a 1930 observation. Mean and standard deviation are for the California male population aged 25–65. Standard errors are clustered at the county level. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

I use this automated linking method to avoid introducing human error into the match procedure. However, there is still a chance of false positives skewing my results (Bailey et al., 2017). I re-run my matching specification and keep only men who are unique based on birthplace and standardized name within a five-year age band in each dataset.[65] I then re-estimate Equation 7 using this sample and replicate my baseline results in Appendix Table 35. The magnitudes of these coefficients are quite similar to those in Table 5, indicating that

[65]In the future, I hope to try other forms of linking robustness, such as Jaro-Winkler string similarity instead of the NYSIIS algorithm.

the matching method is likely not driving the regression results.

Table 35: 1940 Labor Market Results Matching Robustness

	P(In Labor Force)	P(Unemp)	Log W+S Inc	P(Change Occ)	Pct Ch Occscore
Proximity to $BOFA_{1929}$	0.0112	0.00133	0.133***	0.00746	0.132***
	(0.014)	(0.006)	(0.021)	(0.009)	(0.028)
Observations	330694	275632	206326	330694	287057

Sources: Transamerica Corporation vs Federal Reserve Board (1953), Office of the Comptroller of the Currency (various years), California State Banking Department (various years), Ruggles et al. (2017), Morse et al. (n.d.), and author's calculations. Standard errors clustered at 1940 county level. Other explanatory variables in these regressions are 1(white), a quadratic in age, dummies for having an eighth grade education, 1930 marital and rural status, 1930 city of residence population, and fixed effects for 1940 county and 1930 industry and occupation groups. Only men over the age of 16 in 1930 living in California in 1940 included. Proximity is 1 if within five miles of a 1929 BofA location in 1940. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

11.3 Variable Definitions

In this section, I discuss in more depth the variables used in the individual-level analysis. In many cases, I use the Ruggles et al. (2017) definition to create a binary variable. For example, I use the race variable to define a race binary variable which takes the value 1 if the observation has the racial category white. I do this for race, urban/rural status, and marital status (based on whether the individual reports being currently married).

Other variables I take directly from Ruggles et al. (2017). I use OCCSCORE and age as given. I define a labor force participation dummy using the LABFORCE variable such that being in the labor force is 1. Similarly, unemployment is defined as 1 if the individual reports not having a job (from EMPSTAT) but being in the labor force in the Census. If an observation in 1940 reports having at least an eighth grade education, then the education dummy takes the value 1. Because income was top-coded at 5,000 dollars in the 1940 census, I recode any observation of income above that threshold to be equal to 5,001 and also recode that variable to missing if income was listed as being 99998.

To characterize individuals' occupation and industry, I rely on the OCC1950 and IND1950 variables. I correct for uncoded occupation and industry strings, which take the value 979 in the IPUMS coding scheme, by matching individuals' industry and occupation strings to the modal OCC1950, IND1950, and OCCSCORE values in the 1930 and 1940 censuses. Then, I create occupation and industry categories by collapsing the OCC1950 and IND1950 codes into six categories each using the same logic as Long and Ferrie (2013). I group all IND1950 codes between 100 and 299 into the agriculture and mining category, between 300 and 499 as manufacturing and construction, between 500 and 599 as transportation and utilities, between 600 and 699 as retail and wholesale trade, between 700 and 899 as services, and between 900 and 950 as government. The occupation categories are as follows: between 1 and 199 are professional and managerial, between 200 and 299 and 800 and 899 as farming (which includes farmers, farm managers, farm tenants, and farm laborers), between 300 and 499 as clerical and sales workers, between 500 and 699 as craftsmen and operatives, between 700 and 799 as service workers, and between 900 and 970 as nonfarm laborers. If a person changes from one of these occupation categories to another, I code that as a change in occupation group. The same is true for a change in industry group. I calculate the percent change in occscore as $\frac{OCCSCORE_{40}-OCCSCORE_{30}}{OCCSCORE_{30}}$. The skill upgrading variable is an indicator variable which is 1 if $OCCSCORE_{40} > OCCSCORE_{30}$.