BRANCH BANKING AND THE TRANSFORMATION OF BANKING IN CALIFORNIA

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Because California was a pioneer in the development of intrastate branching, we use its experience during the 1920s and 1930s to assess the effects of the expansion of large-scale branch-banking networks on competition and the stability of banking systems. Using a new database of individual bank balance sheets and branch establishment, we examine the characteristics that made a bank a more likely target of a takeover, how competing unit banks responded to the presence of branch banks, and how branching networks affected the probability of survival of banks during the Great Depression. We find some evidence that well-capitalized banks and those displaying characteristics of more profitable institutions were the most likely targets for acquisition. We show that unit banks responded to the expansion in branch banking by changing their operations in ways consistent with efforts to increase efficiency and profitability. Our analysis suggests that, as a result of competition, unit banks competing with branch bank networks, especially with the Bank of America, were more likely to survive the Depression than banks that were not facing such competition. Thus, our results support the hypothesis that branch banking produces an externality in that it improves the stability of banking systems by promoting consolidation, increasing competition, and forcing other banks to become more efficient.

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I. Introduction

The recent deregulation of interstate branching in the United States due to interstate agreements and the Riegle-Neal Interstate Banking and Branching Efficiency Act has unleashed a flurry of bank mergers and acquisitions as banks have sought to expand their scale and scope. The dramatic changes in the banking landscape have renewed interest in understanding how branch-banking networks affect competition among banks and the stability of the nation's banking system (Berger, Demsetz, and Strahan (1999) provide a detailed survey). Researchers have examined the characteristics that make banks targets for merger and acquisition as well as how such consolidation influences the behavior of competing banks. To a more limited extent, the literature has also explored how the wave of consolidation and the creation of larger banking networks affect systemic stability. Nonetheless, it is difficult to assess the long-run effect of branching networks on the stability of the U.S. banking system, especially on the viability of smaller banks, using data from a consolidation process that is still underway. Moreover, a problem of observational equivalence exists: the recent dearth of bank failures may simply be due to the fact that there have been no large macroeconomic shocks to test how the emerging interstate branch banking system performs when it is stressed.[1]

The current bank merger wave in US banking is not without historical precedent. The 1920s were also a period of banking consolidation and rapid expansion in branching (Alston, Grove, and Wheelock 1994, Carlson and Mitchener forthcoming, Wheelock 1993, and White 1985). Most notably, branch banking expanded dramatically in California as large banks purchased numerous smaller banks to create branching networks. Between 1922 and 1929, 48 percent of the banks in California that existed in 1922 were absorbed by other banks. This is comparable in scope to the recent period, during which 32 percent of the banks that existed in the United States in 1997 were

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[1] According to NBER business cycle data, the last two business cycles have been among the shortest (8 months) and least severe in the postwar period.

purchased by other banks by 2004.[2] The expansion of branching in California in turn was due largely to A.P. Giannini, founder of Bank of America, whose branching policies made California the unrivaled leader in the branch banking movement of the 1920s. Due to the Bank of America's leadership, California's branching networks developed more quickly and more extensively than any other state during this decade (see Table 1). As Bank of America's branches blanketed the state, several other large banks were compelled to respond to Giannini's competitive threat by set up their own branching networks.

Using a new historical data set containing information about balance sheets of individual commercial banks as well as bank mergers and branch establishment, we assess the expansion of branching in California, and identify which characteristics of banks and the communities in which they resided made them attractive targets for acquisition. We then examine how banks responded to increased competition from the large branch-banking networks. Finally, using survival analysis we test how the expansion of branching affected the survivability of California banks during the Great Depression. Our study has several important implications for the literature on branch banking, competition, and stability. We are able to compare the current wave of consolidation and branch bank expansion with a previous era that shared similar characteristics, and provide a longer-run perspective on how consolidation, induced by branch banking, affects bank competition. Further, analyzing how the California banking system fared in the Great Depression offers a unique test of how the removal of geographical restrictions on banking and the adoption of branch banking affects financial stability.

Our analysis also sheds light on notable debates regarding the banking system in the Great Depression. It has long been argued that the United States banking system was especially exposed to the shock of the Great Depression because of its unit banking structure (Friedman and Schwartz 1963, Calomiris 2000). This has led other scholars to explore the political economy dimensions of branch-banking restrictions (Economides,

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[2] In California, the acquired banks represented about 35 percent of the banking systems assets in the 1920s whereas those that were taken over more recently represented around 40 percent of the assets of the US banking system in 1997. The amount of consolidation during the recent period may be overstated as these

Hubbard, and Palia 1996). The empirical evidence on the effects of branch banking on financial stability, however, has presented somewhat of a puzzle. Studies using state level data find that states allowing branching had lower failure rates (Mitchener 2005, Wheelock 1995), while studies of individual banks find that branch banks were more likely to fail than other banks (Calomiris and Mason 2003, Carlson 2004). Carlson and Mitchener (forthcoming) offer a partial resolution to this puzzle by showing a connection between the expansion of branching and increased competition. Using state-level data, they show that, *ceteris paribus*, branch-banking states experienced more mergers and voluntary liquidations in their banking systems, and suggest that the competitive shakeout that occurred had salutary effects on the stability of these states' banking systems. They suggest that consolidation (induced by branch banking) improved stability, but they lack the micro-level data to test whether it is because weak banks were pruned from the system or because banks that were not taken over became more efficient. Because this paper utilizes detailed information on individual banks and branch locations, we are able to explore exactly how branch banking affected the banking system and provide a more thorough resolution to this empirical puzzle.

In this paper, we find that branches tended to be established in larger cities possibly because there were more business opportunities in these locations. Bank of America's strategy differed from other networks in that its geographical expansion was widespread and not simply centered around large cities. We also find that banks with more loans and securities (interest-earning assets) relative to total assets were more likely to be acquired, and interpret this result as evidence that is consistent with the view that more profitable banks were more likely to be taken over. These results are also consistent with Amel and Liang (1997), which finds that higher profits in a particular market lead to bank entry, and Stiroh and Strahan (2003), which suggests that banks enter markets by buying good banks and competing against poor performers; however, they differ from Wheelock and Wilson (2000), which finds that banks being purchased tended to have lower earnings and be less well capitalized.

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figures include some consolidation within holding companies, although some of the largest of these consolidations have been excluded.

We also find that banks that competed with branch banks, especially those that competed with the Bank of America, took measures to improve their profitability, likely in response to a change in the competitive environment. Relative to other assets, unit banks shifted their portfolios towards assets like loans, which typically earned higher returns. They also increased the share of demand deposits, relative to savings deposits, since these paid lower rates of interest to depositors. And they increased the size of their surplus in their net worth, which improved the protection offered to shareholders. These findings mirror those, using more recent data, of Jayaratne and Strahan (1998) and DeYoung, Hasan, and Kirchhoff (1998), which find that reductions in banking restrictions lead eventually to increased efficiency.

Finally, this paper sheds additional light on how the growth of these intrastate banking networks affected the survivability of banks during the Great Depression. Unit banks in locations where large branch banks established offices responded to external pressures by changing their operations and became more efficient. We find that unit banks competing with branching networks were more likely to survive the Depression even after accounting for the possibility of selection bias in our econometric model. Our result appears especially relevant for very large branching networks, such as the Bank of America, which had the widest geographic scope and appeared to prompt the largest changes in balance-sheet positioning. Thus, Giannini's assault on local geographic monopolies appears to have transformed California's banking system producing an externality, such that extant banks to improve their efficiency in ways that enabled them to better cope with the macroeconomic shock of the Great Depression. This finding is important for two reasons. First it suggests that, following the current shakeout, the wave of consolidation will improve the stability of the banking system for both large and small banks. Second, it suggests that the banking system of the United States would have been less fragile in the 1930s had states allowed more branching, not necessarily because the branch banks would have been more diversified, but because the system would have consisted of more efficient banks.

The paper is organized as follows. Section 2 discusses the history and legal environment surrounding the growth of branch banking in California in the 1920s. Section 3 presents analysis of the factors that led towns and banks to be desirable for

mergers. Changes in bank behavior following the addition of a branch nearby are discussed in Section 4. Section 5 discusses the effect of branching on the stability of the banking system. Section 6 concludes.

II. Branch Banking in the 1920s

A. Expansion in California

While branching had occurred on an *ad hoc* basis in California for some time, the banking act of 1909 prescribed a formal process by which banks could establish branches throughout the state, subject to the approval of the state bank superintendent.[3] The use of branching started slowly and then increased rapidly in the 1920s (Figure 1). Two decades later, on the eve of the Depression, branch-banking activity was more extensive in California than in any other state in the country. There were more branches than in any other state (Table 1), and the impact was felt statewide: unlike some other well-branched states, like New York and Michigan, the majority of the branches were established outside the city of the bank's parent institution or home office. By the end of the decade, California was the only state to have more branch offices than banks. California's rapid expansion of branching piqued regulators' interest in the 1920s, and fueled a debate over the merits of branch banking: "This makes us interested in seeing how branch banking has actually been working under American conditions, and California is supposed to be the field of greatest experience thus far."[4]

California's growth in branching relative to other states benefited from entrepreneurial talent and leadership as well as from an initially hospitable regulatory environment. State regulators saw it as their legal duty to enforce the banking act by defending the rights of any state bank interested in establishing branches. Moreover, an

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[3] Section 9 of the 1909 act stated that "No bank in this State…shall hereafter open or keep an office other than its principal place of business, without first having obtained the written approval of the superintendent of banks to the opening of such branch office, which written approval may be given or withheld in his discretion, and shall not be given by him until he has ascertained to his satisfaction that the public convenience and advantage will be promoted by the opening of such a branch office." House of Representatives, (1930, Volume 2, Part 2, pp.1342).

[4] House of Representatives, (1930, Volume 1, p.18).

amendment to the act facilitated branching by enabling mergers to occur with no additional capital.[5]

Another feature that made California particularly ripe for the expansion of branching in the 1920s was its diversity of crops and industrial production. Unlike many Midwestern states, agricultural cycles were not coincident in timing in California. With harvests and plantings for various crops occurring at different times of the year, geographically-dispersed branching systems were well-suited to shifting funds from one area or region to another in order to maximize the utilization of existing bank capital.[6]

B. California's Large Branch-Bank Networks

At the forefront of the California branching movement was A.P. Giannini, founder of the Bank of America, who through purchase and *de novo* branch creation had established the largest branching network in the state and the largest bank on the Pacific Coast by 1929 (Figure 2 shows the share of California branches owned by the Bank of America).[7] Some competing branching networks began to emerge in 1921 when Giannini's pioneering efforts to establish branches were adopted by other leading bankers in the state: Henry Robinson, P.E. Bowles, J.F. Sartori, and Edward Elliot. However, the branching network of the Bank of America was larger in scale than those of the other institutions (Table 2).[8] More importantly, the scope of the Bank of America's branching network was much broader, and covered almost the entire state (Figures 3-6). The next

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[5] Minimum capital requirements for banks with branches were higher than those without branches and each additional branch raised the required minimum. However, if a bank already had the minimum required amount of capital, no additional capital needed to be posted. In many cases, the absorbed unit bank's capital, while it functioned as a unit bank, was higher than what was required to operate it as a branch.

[6] Some also argued that important agricultural centers like the San Joaquin and Imperial Valleys had seasonal demand for funds that exceeded what could be supplied by local banks. For a discussion of these points, see "Branch Banking is a Live Wire Subject," *Los Angeles Times*, July 1, 1922, p.I7, "Branch Banking," *Los Angeles Times*, December 4, 1922, p.I14, "California Bank Merger with $200,000,000 in Resources," *Wall Street Journal*, July 3, 1922, p.4, and "Branch Banking in California," *Wall Street Journal*, September 22, 1923, p.4.

[7] Giannini's original bank was the Bank of Italy, founded in 1904. In the 1920s, he established other institutions, such as Bank of America and Liberty Bank. These were consolidated into Bank of America in 1927, which was in turn part of the Transamerica holding company. For ease of exposition, we use the name Bank of America to refer to all Giannini institutions collectively unless it is necessary to refer to a specific one.

largest bank, the Security-First National, expanded around Los Angeles and into the central valley, while the American Trust Bank and the California Bank were clustered around San Francisco and Los Angeles respectively.[9] The willingness of the Bank of America to enter smaller towns can also be seen by looking at the distribution of its branches by town size (Table 3).

As the Bank of America was the only institution to establish a truly statewide presence, we expect it to have the strongest influence on the state's banking environment. The anecdotal evidence suggests that the expansion of the Bank of America did indeed have a profound impact on the California banking system, introducing competition to localities that were previously geographic monopolies. James and James (1954) report that the Bank of America was able to offer lower loan rates than the smaller banks of the central valley. Bonadio (1994) indicates that the average rate of interest in towns would decline following the establishment of a Bank of America branch. We expect that the impact of the other large branch banks will be noticeable, but likely not as large.

C. Response of other bankers

The growth in branching was not without its opponents. Changing attitudes of state and federal regulators toward branching and resistance from unit bankers hampered efforts by the branch bankers, especially Giannini, to establish intrastate branching networks. During the 1920s, some California bank supervisors used their discretionary authority to restrict the geographic spread of branching across the state by informally dividing it into two regions, North and South, and limiting banks to setting up branches only in the region in which they were headquartered. Such restrictions may have been implemented at the behest of California's unit bankers. In 1922, unit bankers, worried by the competitive threat of an expanding number of branching networks in the state, formed the California League of Independent Bankers (CLIB) as a lobbying organization aimed

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[8] It should be noted that the Bank of America had head offices in two cities. The nationally chartered Bank of Italy was headquartered in San Francisco while the state-chartered Bank of America was headquartered in Los Angeles.

[9] The Security First-National and American Trust Bank were formed through the mergers of moderate-sized branch networks during the 1920s. There were a few other banks with a modest number of branches; however, these branches were almost exclusively within the city of Los Angeles.

at the "preservation of unit banking." Calling branching the "menace of the hour," they regularly canvassed the state legislature to abolish all non-home-office-city branches.[10] According to Bonadio (1994, p.86) nearly all of the state's more than 500 independent bankers had joined this group by 1922, with league members taking vows to "never sell out to Giannini." They argued that the growth of branch banking was leading to a monopoly of the moneyed interests, "Branch banking emanates from the minds of a few city bankers. It enables a few city men to control the banking assets of the state."[11]

Although CLIB did not succeed in their ultimate goal, in 1923 the state-banking department adopted several rulings aimed at limiting the growth in branching. No branch could be established outside the home-office city via consolidation or purchase unless both banks were at least three years old and the Superintendent found the branch to be for public convenience and advantage. More important for the location of branch expansion was the "*de novo* rule," which went into effect in 1921 under state bank superintendent Jonathan Dodge. It limited the establishment of a new branch outside the "principal place of business," except by discretion of the state superintendent of banks. This restricted Giannini's plans for expansion of his San Francisco-based banks into the southern half of the state. Between 1923 and June 1925, the Superintendent issued 103 permits to Los Angeles banks for *de novo* banks in LA, but only one was granted to the Bank of Italy (headquartered in northern California), and this branch was already being processed when the ruling was announced. The *de novo* rule was favored by most of the southern California branch bankers, who wanted to keep Giannini's network from expanding into the southern California market and competing head-to-head.[12] Bankers like Giannini thus pursued growth through an aggressive merger and acquisition strategy. Giannini began to use the Bancitaly Corporation (headquartered in Los Angeles) and a second, newly-formed bank holding company, Americommercial, to purchase Los Angeles-based banks and build a branching empire in Southern California. After two additional applications to establish branches were denied, the Bank of Italy filed suit in 1926 to overturn the "*de*

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[10] The first two articles of association of CLIB stated, "We believe that branch banking is economically wrong, monopolistic in nature, and un-American in principle...We view with alarm the growth of branch banking in California as permitted under our present law." (Chapin Hall, "Daily Trade Talk," *Los Angeles Times*, November 28, 1922, p.I10.

[11] Quote of Carlos Hardy, Los Angeles attorney, appearing in *Coast Banker*, Nov. 1922, p. 501.

[12] See "Giannini Arouses Bankers," Earle E. Crowe, *Los Angeles Times*, March 14, 1925, p.15.

novo rule," arguing that the California Banking Act did not permit the superintendent of banking to restrict branch location (Westerfield, 1939). Although the rule was not changed, new personnel in the California banking department after the suit was filed enforced this rule less rigidly for the rest of the decade, and Bank of Italy (along with the related companies of Transamerica and Bank of America) was able to further expand in Southern California.

III. The Decision to Establish a Branch

Although the 1909 Banking Law permitted branching, it initially grew slowly in California; as statewide branching was without precedent, Bank of America deemed it "prudent to 'make haste slowly," and had only opened 23 branches by 1919.[13] Since widespread networks did not emerge until 1921 for banks other than the Bank of America, we use 1922 as the departure date for this study.

During the 1920s there was a massive consolidation of California banks through merger and acquisition. As noted earlier, roughly one-half of the banks in existence in 1922 had been purchased or had merged with another bank by the end of 1929. Moreover, most of the expansion of branching networks outside the city of the bank's home office (typically San Francisco or Los Angeles) was done through acquisition (Table 4). The number of mergers was spread relatively evenly over time, although there was a spike in mergers during 1927. Acquisitions of banks by town size also tended to reflect the distribution of banks at the start of the period (Table 5).

This section investigates the characteristics that made banks more likely to be targets for acquisition by examining all the purchases of banks during the period 1922-1929. We focus on the banks that were in existence in 1922. Since we are interested in the targets for acquisition, we test how bank balance-sheet information and locational characteristics are related to the time until the bank was taken over. Before carrying out our empirical analysis of acquisitions, however, we relate this to the issue of branching by briefly discussing the relative merits of expanding through acquisition rather than *de novo* branching.

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[13] House of Representatives (1930, Volume 2, Part 2, p.1342).

A. Acquisition vs. de novo expansion

Legal restrictions on *de novo* branching played a significant role in pushing banks to expand through merger and acquisition. Even though these could sometimes be circumvented, there were additional reasons why banks may have preferred to expand through a strategy of merger and acquisition. First, it was cheaper (in terms of fixed costs) to acquire an existing facility than to build a branch from scratch. Second, by taking over a previously existing bank, the acquiring bank was able to draw on the managerial experience and long-term lending of the existing bank and their specialized lending relationships. The Bank of America recognized these advantages and explicitly based its branch-expansion strategy on acquisition rather than establishing *de novo* branches. Giannini believed that rural communities would be more willing to accept an outside bank if it took over the operations of an existing bank. Explaining the strategy of Bank of America to Congress in 1930, James Bacigalupi, Vice Chairman of the holding company, stated:

> It was reasoned that the prudent way to enter an outside community was to purchase an established bank, because otherwise it could only be hoped, at the outset, to attract a few disgruntled depositors and before sufficient good business could be worked into, principally that which theretofore could find no accommodation there on account of the smaller capital and limited resources of the local banks, it would be years. Then, again, the bank would inevitably be confronted with the necessity of building a brand new local staff for the branch office – not the easiest thing in modern banking. Subsequent experience of the Bank of Italy demonstrated the soundness of this reasoning. By purchasing a good bank – and, almost without exception, such have been the banks which it has purchased – it acquired a staff, an advisory board, and local stockholders who were interested in the locality and familiar with local people, values, and conditions.[14]

Bacigalupi further testified that Bank of America consistently established branches through the purchase of *existing* banks in every community it entered, with only one notable exception, Sacramento, where "it was found impossible to purchase a bank and, as result of popular petition, led by the chamber of commerce of that city, the then

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[14] House of Representatives (1930, Volume 2, Part 2, p.1341).

superintendent of banks granted Bank of Italy a permit to open a brand new office, a so-called *de novo* branch."[15] The Bank of America's decision to purchase banks rather than create *de novo* branches and its policy of retaining the existing management to run the newly formed branch may have been aimed at ensuring better-quality local lending.[16] As Berger and Udell (2002) emphasize, small local banks may be inherently better at resolving agency problems associated with relationship lending. Relationship lending requires that banks gather information beyond what is readily available in financial statements of firms; such information is gathered through repeated contact with the firm and by observing its behavior on past loans and business with the bank. By employing the key executives of the former independent unit bank as branch managers and loan directors, Bank of America and other branching networks that pursued a similar strategy may have been attempting to reduce the oversight problems a large bank would otherwise face in relationship lending and better manage the "soft" data associated with the character and reliability of its borrowers.[17]

Banks were purchased either by acquiring their assets or by establishing holding companies that were organized with the explicit purpose of buying other banks. The Bank of America frequently employed the latter method and created the Stockholders Auxiliary Corporation (a holding company wholly owned by the shareholders of the bank) to acquire banks for its branching system.[18]

As Table 4 further elucidates, the growth in branches outside the home-office city took place largely by purchasing existing banks. *De novo* branches were largely confined to the largest cities of the state, especially San Francisco and Los Angeles, where the large branch networks already had substantial operations and merely expanded into areas

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[15] House of Representatives (1930, Volume 2, Part 2, p.1341).

[16] See the comments by Giannini (House of Representatives 1930, Volume 2, Part 2, p.1544).

[17] For evidence that large banks typically face a disadvantage in relationship lending aimed at small, opaque firms, see Berger, Kashyap, and Scalise (1995). For evidence that non-BofA branching networks also retained management, see "New Bank Merger is Announced," *Los Angeles Times*, March 11, 1922, p.I13 and "Porterville Bank Merger Effective," *Los Angeles Times*, January 5, 1924, p.16, and "California Bank Merger," *Wall Street Journal*, September 11, 1926.

[18] The banking act of California did not permit banks to purchase the stock of another bank directly, but Section 31 permitted banks to purchase the assets of another bank. This was the method of direct consolidation employed by Bank of America and other branching networks in California. The bank holding company was a convenient corporate entity used to maneuver around regulatory restrictions on banking activities; for example, the Stockholders Auxiliary Corporation was used as an insurance agent and broker and to dispense of "problem" assets of banks (House of Representatives (1930, Volume 2, Part 2, p.1343).

where they recognized new business activities.[19] Nearly 80% of the new branches in small towns were created through acquisition of an existing bank rather than by constructing new branch offices. The remainder of this section thus focuses on understanding the decisions related to bank acquisition rather than the establishment of *de novo* branches.

B. Analysis of City and County Characteristics

We first examine which city and county characteristics were important in a bank's decision to establish a branch. All else equal, banks likely preferred to establish branches in areas where business opportunities were plentiful. For example, studies examining entry into foreign markets have found that banks prefer to enter markets in countries with higher economic growth prospects (Focarelli and Pozzolo 2002). With the boom in California agriculture during this period, banks may have sought out locations that would facilitate loans to farms and growing agro-businesses. Competition from other banks may also have affected expansion decisions. Proximity to a major city may have been preferred, as it would have facilitated close contact with the bank's headquarters, or banks may have sought to diversify their activities geographically by expanding away from the large cities.

In order to examine the factors that led one city to be preferred over another, we estimate the time it took for a branch to be established in a town. We consider three different specifications: (1) the time until the Bank of America established a branch in the town; (2) the time until a large branching network other than the Bank of America established a branch (those shown in Figures 4-6); and (3) the time until a small branching network established a branch (any other branching network). Since we use the time until an event occurs as our dependent variable, we use duration analysis. This

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[19] During our sample period, 65% of de novo branching was in San Francisco and Los Angeles and 85% of it was in cities with populations greater than or equal to 20,000. See House of Representatives (1930, Volume 2, Part 2, p.1361) for a further discussion of this point.

technique allows us to fully utilize information about the order in which branches were established in different cities and to update the independent variables as they change.[20]

The cities used in this analysis are those that were incorporated in 1920 and had population information reported in the 1920 Census. We construct measures of the city's size, importance, and proximity to large cities (either San Francisco or Los Angeles). We include several measures of the level of bank competition at the city or town level, including whether there is a national bank established there, whether the town is served by only a single bank, and the number of financial institutions per capita.[21] We also examine a variety of county level factors. These include items related to income and population density as well as the importance of agriculture in the county. Further, Secrist (1930) suggests that banking practices differed between the Northern and Southern parts of the state, so we also include a dummy for whether the county is in the Northern half of the state.[22]

Data on branch location were primarily collected from Comptroller of Currency *Annual Report* and *Statements of Conditions* and the *Annual Report* of the Superintendent of Banks of the State of California; however, we supplemented this information with data from Rand McNally (various years) as well as with internal records from the Bank of America's archives. Data on city attributes, such as size and county seat status, were collected from Rand McNally (1922), U.S. Department of Commerce (1920), and California State Department of Finance (2004). Proximity to a major metropolitan area might affect decisions regarding branching as well as the competitive environment, so we collected the distances from principal California cities (Los Angeles or San Francisco), using "as the crow flies" distances based on programming and data from the U.S.

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[20] In our tables using duration analysis, we report transformed regression coefficients to ease interpretation (although standard errors refer to non-transformed coefficients). For a given coefficient β, we report the value $100*(\exp(\beta) - 1)$, which indicates the percentage change in the expected time until the event occurs for each one-unit increase in the independent variable. Thus, a regression coefficient of 0.0535 would be reported in the table as 5.5, which implies that a one-unit increase in this independent variable boosts the expected time until the event by 5.5 percent. Note that negatively-signed coefficients indicate a reduction in the expected time to the event.

[21] All measures of bank competition are updated as they change. Town population is from the start of our sample period and is treated as a constant over the remainder of the period.

[22] Secrist notes that, on average, banks in the Northern part of the state had fewer loans as a share of assets and a lower ratio of demand deposits to total deposits. The reason for these differences is not discussed.

Geological Survey.[23] A town is considered "near" a large city if it is within 15 miles of that city. Other county characteristics (such as population, farm size, industry mix) are from U.S. Department of Commerce (1920, 1930).

For municipality m, we estimate the following equation:

(1) Time until a branch is established$_m$ = f{ $\beta_1 Log\ population_m$ + $\beta_2 County\ seat_m$ +

$\beta_3 Near\ a\ large\ city_m$ + $\beta_4 Log\ distance\ to\ nearest\ large\ city_m$ + $\beta_5 National\ bank\ in\ city_{mt}$ +

$\beta_6 One\ banking\ institution_{mt}$ + $\beta_7 Banking\ institutions\ per\ capita_{mt}$ +

$\beta_8 County\ population\ density_m$ + $\beta_9 County\ Income\ per\ capita_m$ +

$\beta_{10} Share\ of\ county\ income\ from\ agriculture_m$ + $\beta_{11} Share\ county\ population\ that\ is\ literate_m$ +

$\beta_{12} County\ is\ in\ the\ Northern\ part\ of\ the\ state_m$ },

where t indicates that the city characteristic changes over time.[24] (No t subscript indicates that the variable is fixed at its 1922 value). Because we use the time until a branch is established in the community, only cities without any branches of the branch group in question as of June 30, 1922 are included in the analysis.

As table 6 shows, we find that large towns were more desirable locations for establishing branches than smaller towns, possibly because these locations offered more business opportunities. (This is true even if the sample is restricted to cities with less than 20,000 people.) Towns far from the large cities appeared to have been attractive only to the Bank of America. Further, the Bank of America had a slight preference from branching in the northern part of the state, likely due to the actions of regulators described above. This is also confirmed by examining Figures 3-7. On the other hand, other large branch banks sought to keep branches near San Francisco and Los Angeles, possibly to maintain more direct control over the branches' activities.[25] Moreover, other branching networks appeared to prefer to branch in the southern part of the state, which

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[23] We use information from http://www.indo.com/distance/, which is based on the "geod" program – a part of the "PROJ" system available from the U.S. Geological Survey.

[24] In the estimation, we assume a log-logistic distribution. Likelihood ratio tests suggest that this distribution provides the best fit. Similar tests are used to determine the best distribution each time duration analysis is used.

[25] The *Coast Banker*, February 1925, p.202, suggests that branch banks in Los Angeles were purchasing banks in order to further "consolidate the banking resources of large institutions in Los Angeles with those of outlying communities in Southern California." And the Los Angeles times reported in 1922 that branch bank expansion was now "at a flood tide," with seventeen new branches being added by Los Angeles Trust & Savings Bank, Citizens Trust and Savings Bank, and Security Trust and Savings Bank ("Extension of Branch Bank Idea," *Los Angeles Times*, May 7, 1922, p.I12.)

was growing more quickly in population than the northern part in the 1920s.[26] Trade publications from the 1920s suggest that a considerable amount of branching competition resulted in the southern part of the state.[27] These banks also avoided setting up branches in agricultural communities. Small branch bansk appeared to have a strong preference for establishing branches in agricultural communities.

C. Analysis of Bank Characteristics

We now examine which characteristics of banks made them more or less attractive for acquisition. We collected balance sheet data on all California commercial banks in 1922 and at the end of the decade in 1929 using information for national banks contained in the Comptroller of Currency *Annual Report* and *Statements of Conditions* and information on state-chartered banks from the *Annual Report* of the Superintendent of Banks of the State of California. The data are similar to those used in other studies examining bank failures in the 1930s (Calomiris and Mason 1997, Carlson 2004, etc.). From these sources and the Bank of America's archives, we also gathered data on all changes in the competitive environment for California banks between 1922 and 1933 – bank openings, mergers, acquisitions, *de novo* branches, voluntary liquidations, and bank failures. These data enable us to examine the effects of branching in towns, cities, counties, and across the state, and to draw inferences on how its growth reshaped the competitive landscape and the stability of California banks during the Great Depression.

Some of the balance sheet characteristics we use reflect profitability, such as ratios of interest-earning assets to total assets or demand deposits to total deposits, while other characteristics reflect the soundness of the bank, such as ratios of capital or surplus to assets and excess capital to total capital,[28] and some characteristics reflect the liquidity of the bank, such as the cash to deposit ratio. All else equal, one might expect acquiring

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[26] For example, many bankers believed that Southern California in the 1920s was particularly well suited to branch banking because there were new crops that matured every month, which necessitated elastic provision of working capital and currency provision. See Chapin Hall, "Business, Financial Markets, Investment – Daily trade talk," *Los Angeles Times*, August 5, 1922, p.I6.

[27] For example, see "Branch Banking in Action: A Practical View," by J. Dabney Day, President, Citizens National Trust and Savings Bank, Los Angeles in *Coast Banker*, February 20, 1929, vol.42, p.173 and "The Branching Expansion Slows Down," Howard Whipple, President, CLIB, June 1925, p.104.

[28] Excess capital is capital held by the bank beyond what it is legally required to hold.

banks to prefer to take over sound and profitable banks. However, some historians (Bonadio 1994) writing on California's consolidation in the 1920s have suggested that regulators may have encouraged the large branch networks to take over *failing* banks. We also include a variety of other attributes that might affect whether a bank is a desirable target for acquisition. These attributes include the age of the bank (as older banks might be more loathe to give up an established reputation or may have developed better relationship-banking skills), whether the bank had branches (which might make the bank more difficult to digest), and the bank's charter status (which might affect the ease of regulatory approval).[29] We also include several of the geographical factors that we found in the previous section to have influenced the desirability of the bank's location. We test whether these different factors affect the time until the bank was taken over using duration analysis. Our estimation procedure parallels recent work analyzing the factors that contributed to the failure of banks during the Depression (Calomiris and Mason 2003, Carlson 2004), which also uses duration analysis. Thus, for bank i, we estimate the equation:

(2) Time until merger$_i$ = f { β_1*Log assets$_i$* + β_2*Interest bearing assets to total assets$_i$* +
β_3*Capital to assets$_i$* + β_4*Surplus to assets$_i$* + β_5*Excess capital ratio$_i$* + β_6*Cash to deposits$_i$* +
β_7*Demand deposits to total deposits$_i$* + β_8*State bank indicator$_i$* + β_9*Log age of bank$_i$* +
β_{10}*Federal Reserve Memeber$_i$* + β_{11}*Trust Dept$_i$* + β_{12}*Log town population$_i$* +
β_{13}*Log distance to large city$_i$* + β_{14}*Share of county income from agriculture$_i$* +
β_{15}*County in north of state$_i$* }.

We estimate equation (2) using three different definitions of the righthand-side variable: (1) the time until the Bank of America acquired a bank, (2) the time until a large

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[29] Further, there were regulatory differences that affected the attributes of the banks beyond what is immediately obvious from the top line balance sheet numbers. For instance, California's banking law was also relatively unique in that it required state banks to completely segregate commercial, savings, and trust departments. State bankers aggressively advertised this difference in organizational structure in an attempt to gain a competitive advantage over national banks in the state and attract more deposits. They publicized the idea that savings depositors would be safer in their banking system if runs occurred because they would not have to line up alongside commercial depositors to withdraw their deposited funds. Consequently, California had a higher percentage of savings deposits relative to total deposits than the nation as a whole: 64% versus 44% in 1925 (Westerfield, 1939).

branching network other than the Bank of America acquired a bank, and (3) the time until a small branching network made an acquisition.

Table 7 indicates several factors were important in determining which banks were targeted for acquisition during the 1920s. Bank of America preferred to take over banks with more interest earning assets as a share of total assets. This finding is consistent with the notion that more profitable banks were preferred targets of acquisition, since interest income is one of the principal sources of bank income. The Bank of America also acquired banks with more excess capital, which is consistent with a preference for acquiring more solvent banks. Other large banks preferred to take over state banks, perhaps because of regulatory ease, and to take over banks closer to larger cities. Small banks avoided taking over Federal Reserve member banks and banks in the northern part of the state.

That there may have been a preference for taking over banks that displayed indicators of financial strength is not surprising as these would be the easiest to digest and absorb into an existing network of branches. These results are consistent with Stiroh and Strahan (2003), which suggests that banks enter markets by buying good banks and competing against poor performers; however, they differ from Wheelock and Wilson (2000), which finds that banks being purchased tended to have lower earnings and be less well capitalized. Our finding is also consistent with the conclusions of contemporaneous policymakers examining California's experience. For instance, the Federal Reserve reports that, "There is, of course, every reason to believe that the great majority of the unit banks absorbed by the branch operating banks of California were in sound condition when taken over. Those in financial difficulty were undoubtedly the exception rather than the rule (1932, Vol. 8, p.103)." Although newspaper accounts often played on the drama of taking over troubled banks during the 1920s (for example, Bank of Italy and Pacific Southwest Trust and Saving's bank purchase of troubled Valley Bank of Fresno), there are nevertheless many accounts from the period suggesting that, in general, branching networks preferred strong banks.[30]

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[30] For example, when the Bank of America moved into the Imperial Valley, the *Los Angeles Times* reported that its first acquisition was the First Bank of El Centro, "one of the strongest financial institutions in the rapidly developing Imperial Valley." ("Business News of Busy Marts," *Los Angeles Times*, February 25, 1923, p.II10). BofA's expansion into Kern county took place by acquiring "one of the substantial

As a sensitivity test, we examined whether the acquiring banks sought out different characteristics in banks in communities of different sizes. For example, the banks making the acquisitions may have been more focused on the balance sheet characteristics of banks in large cities, but more interested in the community characteristics of smaller towns. Instead, as Table 8 shows, we find that many of the same factors that mattered overall mattered in small towns (perhaps not surprising since these make up a vast majority of the acquired banks). Additionally, we note even stronger aversion to rural banks by large branch banks other than the Bank of America. (Our econometric specification was unable identify too many factors that mattered for taking over banks in larger cities.) There is some evidence that large branching networks, other than Bank of America's, leaned toward acquiring older banks with trust departments, which might be more dependable institutions. Overall, our results suggest that branching networks did not specifically target troubled banks for acquisition.[31] In particular, the Bank of America seemed to prefer sound and profitable banks and appears to have been successful in searching the entire state for banks that reflected these characteristics.

IV. Changes in Bank Behavior Resulting from Consolidation

We now turn to examining the effects this wave of consolidation had on competition in local banking markets. In particular, we examine whether banks in towns where a branch was established changed their behavior in response to the fact that they now faced competition from a branch-banking institution – what is often called the external-market effect. The banking literature suggests that the dynamics of banking ought to change with the introduction of branching as it increases competition and breaks down local monopolies. The increase in competition generated by branching networks occurs over both quantity (customers) and price; the remaining firms may respond by changing their behavior and improving the efficiency of their operations.

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institutions of San Joaquin Valley." ("Bank of Italy Invades Kern," *Los Angeles Times*, August 26, 1921, p.I18)

[31] Although the sample is much smaller (49 bank purchases), we also examined whether a different pattern was observed for acquisitions occurring during the Great Depression. The only balance sheet characteristic that mattered for 1929-33 was capital-asset ratio; higher values reduced the time it took to be acquired.

Branching networks had a number of advantages that allowed them to compete on price and offer loans at lower rates than the previously extant unit banks. As noted earlier, branch networks generally combined the advantages of small banks (retaining local management and maintaining lending relationships) with the scale economies of larger banks (additional expertise from the central office, standardization of accounting and auditing methods, and reduced overhead costs). Further, branch networks could shift deposits between branches to take advantage of favorable lending opportunities.

Newspaper accounts from the period indicate that large branching institutions, especially the Bank of America, actively competed on price, by offering lower loan rates than competing unit banks; Giannini argued that he had reduced loan rates in small towns to 7 percent, which was anywhere from two to five percentage points lower than what had previously prevailed.[32] This practice is similar to recent bank behavior as noted by Berger, Rosen, and Udell (2001), which finds lower rates in markets dominated by large banks.

Branching networks also competed on quantity. As is widely discussed in the economics literature, legal limits to single borrowers, which are based on capital and surplus, may restrict the ability of smaller banks to lend to larger customers.[33] All else equal, since branched banks were generally much larger in size than unit banks, they could move into a location and capture the business of large customers who may have otherwise gone to a bank outside of the municipality to borrow. This advantage was well known by regulators and bankers during the period.[34] Finally, branch banks also carried out campaigns to lure depositors from other institution; one way of luring customers was by offering services, such as selling securities and trust services that smaller banks did not necessarily provide.[35]

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[32] House of Representatives (1930, Volume 2, Part 2, pp.1547, 1556). See also "Future Fields of Branch Banking," *Coast Banker*, February 1924, p.153.
[33] The limit can be lifted if a smaller bank partners with a larger bank.
[34] For example, see the comments of Will C. Wood, Superintendent of California State Banking, *Coast Banker*, August 20, 1927, "Mr Wood Anaylzes McFadden Act" and comments and data from James Balcigalupi's testimony to the House of Representatives (1930, Volume 2, Part 2, p.1392).
[35] Bankers from the 1920s referred to the additional services a parent institution could provide through its branch banks as "equipment services." These included the purchase and sale of exchange, bonds and commercial paper, acceptances, credit departments, letters of credit, collection of drafts, and research and specialists for advising on real estate and commodity markets. See John E. Barber, "Branch Banking in California," *Los Angeles Times*, October 5, 1922, p.IV7.

Competition over price, quantity, and products may have elicited rival firms to change their management or organizational practices, reduce costs, increase revenues, reduce risk, or improve their product mix in response to the presence of branching networks. To test the reactions of other financial service providers, we examine whether there were more pronounced changes in the balance sheets of banks facing competition from branch banks than in other banks during the 1920s. We analyze the external effects of consolidation and branch expansion by testing whether various balance sheet ratios changed more between 1922 and 1929 for banks that were subjected to competition with branch banks than for banks that either did not face such competition or which already faced it at the beginning of the sample period (and thus had already altered their behavior). In the regression, we also control for initial bank characteristics and changes in town characteristics. We examine the effects of competing with the Bank of America, other large branch banks, and small branch banks. For non-branching bank i, we estimate the following equation using ordinary least squares:

(3) Change in the balance sheet ratio$_i$ = f\{ β_1 *Bank of America established a branch$_i$* +
β_2 *Other large branch bank established a branch$_i$* + β_3 *Small bank established a branch$_i$* +
β_4 *Fed Member$_i$* + β_5 *Log Age of bank$_i$* + β_6 *Trust Dept$_i$* + β_7 *State bank$_i$* +
β_8 *Population growth rate in town 1922-1929$_i$* + β_9 *Log distance to large city$_i$* +
β_{10} *Share of county income from agriculture$_i$* + β_{11} *County in northern part of the state$_i$*\} .

The results shown in Tables 9-11 suggest that banks facing competition from branch banks took steps to increase their profitability, and that the size of the response appears to be more pronounced the larger the branching network that entered the municipality. For instance, competing banks increased the share of loans on their balance sheet and decreased their holdings of securities (loans typically earn a higher rate of return than securities). This change may not be surprising if the interest rate banks were able to charge on loans decreased following the entrance of a branch bank, as reported in contemporary anecdotes. To support their earnings, banks might respond by rebalancing their portfolios to increase loans.

Banks competing with the Bank of America appeared to make additional changes. These institutions increased the share of demand deposits relative to total deposits.

Demand deposits were generally lower cost deposits (Secrist 1930), so this change in behavior is also consistent with efforts to increase efficiency and profitability. To further understand the external effect of branch banking, we examined how balance-sheet characteristics responded to the entry of multiple branching networks. Table 11 reports results where the previous branching variables are replaced by indicators for whether one, two, or three large branch banks added their first branch in the town between 1922 and 1929. We find that banks that started to compete with two large branching networks adjusted their behavior at least as much, if not more, than banks that competed with only one branch network.[36]

These results might be biased if the location that the Bank of America or other large branching networks chose to establish a branch was correlated with some unobserved factor that also would cause banks to change their behavior and balance sheet ratios. For example, selecting cities with better growth prospects might lead to such a bias. To deal with this selection effect, we estimate a two-stage treatment-effect model similar to Maddala (1983). In the first stage, we estimate a logit model examining whether a variety of city and county characteristics affected whether any large branch bank network established a branch in the town between 1922 and 1929.[37] Using the coefficients from the first stage, we determine a treatment effect, which is related to the latent desirability of the municipality as a branch location. We estimate the second stage with this treatment effect. Standard errors of this procedure are determined by bootstrapping the entire procedure. The results shown in Tables 12 and 13 suggest that our findings are not sensitive to selection bias.

Our findings that banks took steps to increase profitability mirror the anecdotal reports published at the time. The *Coast Banker*, a newspaper covering banking on the Pacific coast reported that:

> Cooperation is strengthening the independent banks in their competition
> with chain and branch banking systems was the view expressed by T.C.

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[36] The effects for three branch-banking networks in a municipality are imprecisely estimated in part because few California cities (only Los Angeles and a few suburbs) fit this criterium.
[37] We also tried other dependent variables in the first stage, such as whether just the Bank of America established a branch and whether any bank established a branch. These alternatives produce similar results (not reported).

Scroggs, vice president, National Bank of Commerce, Los Angeles…speakers stressed the point that the rivalry between the two systems was resulting in more efficient management of independent banks (Vol. 44, Feb 20, 1930, p.97).

These results are also similar to findings of research analyzing recent changes in the banking system following consolidation. Some studies, such as Berger and Hannan 1998; Dick 2004; Deyoung, Hasan, and Kirschoff 1998, find that in the 1990s, banks facing less competition were less efficient, and that when competition was introduced, efficiency eventually improved. Berger, Dick, Goldberg, and White (2005) find that competing with a large multi-market bank boosted small bank profitability in the 1980s, but reduced it during the 1990s.

V. How did Competition with Branches Affect the Stability of the Banking System?

We have thus far verified that the 1920s were broadly similar with studies examining the more recent wave of consolidation. We now turn to analyzing the long-run effects of bank stability and assessing how competition from a branching institution affected the survival of banks following the onset of the Great Depression. The relation between competition and stability is theoretically ambiguous. Competition could decrease stability by depriving banks of monopoly profits that might support them during difficult times. Alternatively, and consistent with the evidence from Section IV, the increased efficiency brought about by competition could better enable smaller banks to deal with economic difficulties and thereby increase stability. We test these competing hypotheses by examining whether the establishment of a branch in the town is associated with an increase or decrease in the expected survival time of a bank. Since there were few bank failures in California before 1930, we focus on the interval between June 1929 and either the time at which a bank failed or March 1, 1933 (prior to the government-mandated bank holiday).

We perform a preliminary analysis by examining the Kaplan-Meier survivor function, which shows the proportion of the observations at risk that have not yet failed. We compare banks in the same towns as one of the four large branch banks and in towns

without one of the four large branch banks. Th survivor functions shown in Figure 7 suggests that banks competing with large branch banks survived longer than other banks.

We test our hypothesis more formally using duration analysis, which allows us to include a variety of balance sheet and location characteristics that previous research has found to affect survival time of banks. We include the county unemployment rate in 1929 to control for the severity of economic distress at the start of the period. These characteristics are similar to the ones used previously, except here they are the 1929 values rather than the 1922 values. We consider how time to failure was affected by (1) the presence of a Bank of America branch, (2) the presence of other large branch banks, (3) or the presence of small branch banks. For each non-branch bank i, we estimate the equation:

(4) Time until failure$_i$ = f {β_1Branch of the Bank of America in town$_{it}$ +

β_2Branch of other large branch banks in town$_{it}$ + β_3Branch of a small bank in town$_{it}$ +

β_4Log assets$_i$ + β_5Loans to assets$_i$ + β_6Securities to assets$_i$ + β_7Capital to assets$_i$ +

β_8Surplus to assets$_i$ + β_9Excess Capital ratio$_i$ + β_{10}Cash to deposits$_i$ +

β_{11}Demand deposits to total deposits$_i$ + β_{12}State bank indicator$_i$ + β_{13}Log age of bank$_i$ +

β_{14}Federal Reserve Memeber$_i$ + β_{15}Trust Dept$_i$ + β_{16}Log city population$_i$ +

β_{17}Log distance to large city$_i$ + β_{18}Share of county income from agriculture$_i$ +

β_{19}County unemployment rate$_i$},

where t indicates that the characteristic changes over time.

The results shown in Table 14 are consistent with the notion that competition increases stability. We find that banks facing competition from the Bank of America had an expected survival time 68 percent longer than banks not facing similar competition. Thus it appears that the benefits of increased efficiency exceeded the loss of monopoly profits. Somewhat surprisingly, we do not find a similar effect from competition from other banks. This may reflect the impact of the Bank of America on more banks, as its branching network was considerably larger than those of other banks. We again examine the interaction between competing with multiple large banks by replacing the previous branching variables with indicators for whether the bank competed with one, two, or three large banks. We find that competing with two large banks had at least as large an effect as competing with one bank.

We find only small effects of other factors. The bank's capital structure does appear to have affected bank survival. Banks with more capital in excess of legally required capital and banks with a greater surplus survived longer. As expected, there is also some evidence that banks in areas with more unemployment failed sooner.

Since it is possible that branching networks only chose to expand into areas that were more stable or profitable, we test our results for selection bias using the two-stage treatment procedure described in the previous section. The first stage estimation is based on whether a large branching network had established a branch in the town at the beginning of the sample period (June 1929); thus our second stage also uses only the initial level of the independent variables and does not update them over time. As Table 15 indicates, even when controlling for the desirability of the town as a branching location, competing with the Bank of America, other large branch-banking networks (or multiple networks) increased expected survival time.

V. Conclusions

In this paper, we examine the 20th century's first episode of the development of large-scale branch banking networks and how they transformed the banking system in California. Similar to the recent wave of bank mergers in the United States, we show that consolidation in California in the 1920s occurred as branching networks expanded. Moreover, we find evidence of an external effect: remaining banks changed their behavior in response to large branching networks in ways that are consistent with increased efficiency.

This transformation of the California banking system had important implications for the state as the Great Depression took hold. Banks competing with these large branch banks, especially the Bank of America, were better able to survive the economic shock of the Great Depression, in part because they had been forced to become more efficient. Branching networks of sufficient scale thus appear to have produced a stability externality. This finding confirms the hypothesis of Carlson and Mitchener (2005), that an important benefit of branch banking (and an important reason states allowing it fared better in the 1930s) is its ability to extend the disciplinary power of competition. This

result further suggests that the current wave of consolidation, also induced in part by the extension of branching, will likely strengthen the banking system of the United States and buffer it from future macroeconomic shocks in the long run.

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Figure 1
Number of Branches in California
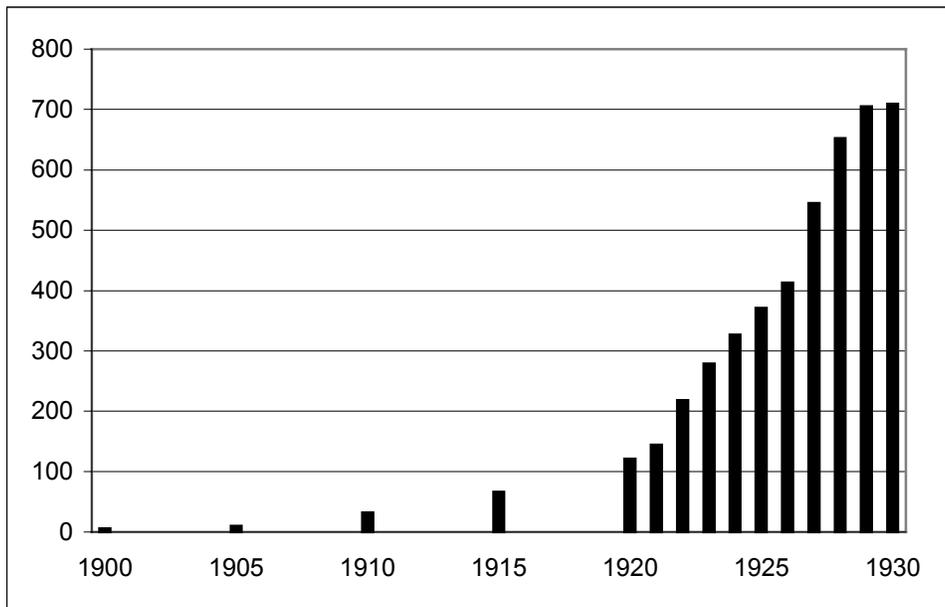
Source: Federal Reserve (1931).

Figure 2
Percentage of California Branches Controlled by the Bank of America
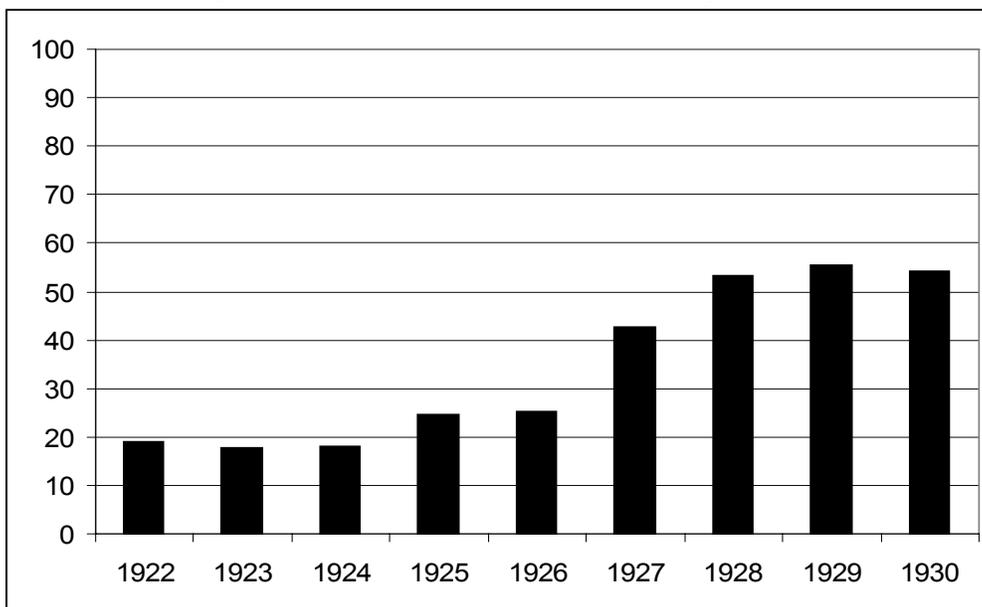
Source: *Annual Report* of the Superintendent of Banks of the State of California (various years), Rand McNally (various years), Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years), and internal records of the Bank of America.

Figure 3
Extent of Branching by Bank of America in 1929

Source: *Annual Report* of the Superintendent of Banks of the State of California (various years), Rand McNally (various years), Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years), and internal records of the Bank of America.

Figure 4
Extent of Branching by Security-First National Bank in 1929

Source: *Annual Report* of the Superintendent of Banks of the State of CA (various years), *Rand McNally* (various years), Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years).

Figure 5
Extent of Branching by American Trust Bank in 1929

Source: *Annual Report* of the Superintendent of Banks of the State of CA (various years), Rand McNally (various years), Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years).

Figure 6
Extent of Branching by California Bank in 1929

Source: *Annual Report* of the Superintendent of Banks of the State of CA (various years), Rand McNally (various years), Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years).

Figure 7
Kaplan-Meier Survivor Function
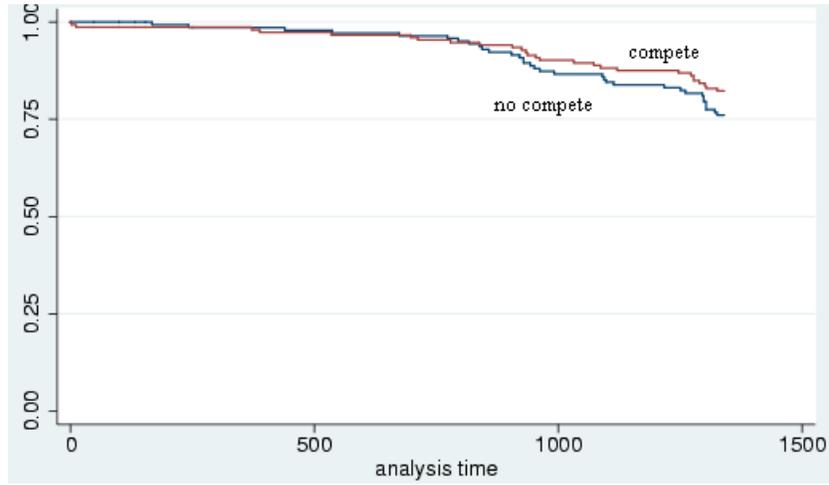
Note. "Compete" indicates banks competing with a large branch bank while "no compete" indicates other banks. Data on branching activity and survival are from the *Annual Report* of the Superintendent of Banks of the State of California (various years) and Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years), with information on branching activity supplemented using internal records of the Bank of America.

Table 1
Branches in the United States in 1929

	California	New York	Michigan	North Carolina	Rest of the United States	United States Total
Branches in city of the bank's home office	314	662	434	11	872	2293
Branches outside the city of the bank's home office	538	0	0	66	452	1056
Total branches	852	662	434	77	1324	3349

Notes and Sources: New York and Michigan have the most total branches after California whereas North Carolina has the most branches outside the city of the bank's home office after California. Federal Reserve (1931).

Table 2
Branches in California in 1929

	Bank of America	Security Trust	American Bank	California Bank	All other banks	Total California
Home Office branches	55	53	34	17	75	234
Outside home-office city	388	84	63	16	55	606
Total Branches	443	137	97	33	130	840

Sources: *Annual Report* of the Superintendent of Banks of the State of CA (various years), Rand McNally (various years), Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years), and internal records of the Bank of America.

Table 3
Branches by Size of Municipality for the 4 Largest Branching Banks in 1929

	Bank of America		Security Trust		American Bank		California Bank	
Town Population	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
Under 500	22	5.0	2	1.5	2	2.1	1	3.3
500-1,000	31	7.1	4	3.1	2	2.1	1	3.3
1,000-2,500	52	11.9	14	10.8	7	7.4	2	6.7
2,500-5,000	46	10.6	5	3.8	8	8.4	1	3.3
5,000-10,000	53	12.2	17	13.1	10	10.5	3	10.0
10,000-25,000	27	6.2	15	11.5	5	5.3	1	3.3
25,000-50,000	25	5.7	6	4.6	3	3.2	4	13.3
50,000-100,000	22	5.0	9	6.9	9	9.5	0	0.0
100,000+	158	36.2	58	44.6	49	51.6	17	56.7
Total	436	100	130	100	95	100	30	100

Source: *Annual Report* of the Superintendent of Banks of the State of CA (various years), Rand McNally (various years), Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years), and internal records of the Bank of America. The four largest branching networks are those shown in table 2.

Table 4
Branch Establishment: *De Novo* versus Merger or Acquisition (M&A)

	Los Angeles		San Francisco		Other Large Cities		Small Cities		Total	
Year	*De Novo*	M&A	*De Novo*	M&A	*De Novo*	M&A	*De Novo*	M&A	*De Novo*	M&A
1923	27	3	16	3	16	5	9	29	68	40
1924	30	3	10	2	10	3	6	19	56	27
1925	17	3	12	0	2	4	2	33	33	40
1926	21	4	5	1	5	1	2	14	33	20
1927	24	6	31	5	21	13	12	57	88	81
1928	4	2	11	4	10	4	12	21	37	31
1929	5	5	3	2	2	1	2	11	12	19
1930	2	0	3	0	0	0	4	6	9	6
1931	2	0	0	0	3	0	1	1	6	1
1932	1	1	0	0	0	0	2	0	3	1
Total	133	27	91	17	69	31	52	191	345	266

Note: Large cities are defined a population greater than or equal to 20,000 in 1922.
Sources: *Annual Report* of the Superintendent of Banks of the State of CA (various years), Rand McNally (various years), Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years), internal records of the Bank of America, and California State Department of Finance (2004).

Table 5
Distribution of Banks by Town Size (1922) and M&A Activity from 1922 to 1929

	Banks		Mergers & Acquisitions	
Town Population	Number	Percent of Total	Number	Percent of Total
Under 500	55	8.0	22	4.6
500-1,000	92	13.3	41	8.6
1,000-2,500	161	23.3	83	17.4
2,500-5,000	119	17.2	96	20.2
5,000-10,000	73	10.6	71	14.9
10,000-25,000	57	8.3	39	8.2
25,000-50,000	30	4.3	19	4.0
50,000-100,000	32	4.6	28	5.9
100,000+	71	10.3	77	16.2
Total	690	100	476	100

Source: *Annual Report* of the Superintendent of Banks of the State of CA (various years), Rand McNally (various years), Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years), and internal records of the Bank of America.

Table 6
City and County Characteristics and the Selection of Branch Location
(Duration analysis)

Dependent Variable: Time from June 30, 1922 until a branch is established in the municipality by:

	Bank of America			Other Large Bank			Small Branch Bank Network		
Log town population	-42.6***	(0.12	)	-96.4***	(0.78	)	-56.3*	(0.49	)
County seat	-4.8	(0.18	)	309.1	(1.02	)	-26.1	(0.81	)
Near a large city	-30.9	(0.25	)	-94.5**	(1.26	)	-4.8	(1.34	)
Log distance to large city	-15.0*	(0.10	)	43.3	(0.56	)	25.7	(0.50	)
National bank in town [t]	-2.0	(0.16	)	464.9*	(0.95	)	182.5	(0.85	)
One bank in town [t]	3.6	(0.17	)	539.8	(1.29	)	-6.1	(0.77	)
Banking institutions per capita (town) [t]	-24.3***	(0.09	)	-61.7	(0.74	)	4.5	(0.48	)
County population density	-2.6	(0.02	)	16.5**	(0.07	)	0.0	(0.07	)
County income per capita	0.6	(0.03	)	-36.8**	(0.22	)	42.7	(0.25	)
Share county income from agriculture	-15.6	(0.28	)	2177.9**	(1.41	)	-99.7*	(3.09	)
Share of county population literate	1.3	(0.04	)	-29.1	(0.24	)	-3.2	(0.23	)
County in the north of the state	-21.9*	(0.14	)	434.8**	(0.85	)	27.9	(0.66	)
Constant	30.0	(27.8	)	-276.6**	(138.7	)	581.2*	(308.7	)
Observations	210			230			189		
Events	126			62			27		
Log-likelihood	-202.1			-224.2			-106.7		
Likelihood Ratio Chi2	84.1			78.5			16.7		

Notes and Sources: Estimated using survival analysis and employing a log-logistic distribution. Reported values are transformed coefficients (see footnote 20). The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. The symbol [t] indicates the variable is updated over time. Standard errors of original coefficients are in parentheses. Data on mergers as well as branch and bank activity are from *Annual Report* of the Superintendent of Banks of the State of CA (various years), *Rand McNally* (various years), Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years). City populations are from the California State Department of Finance (2004) County-level information is from U.S. Department of Commerce (1920). Large city is defined as either San Francisco or Los Angeles, whichever is nearer. Large branch bank network refers to Security-First National Bank, American Trust Bank, and California Bank. Observations are defined as all cities or towns in California without a branch of the bank group being investigated as of June 30, 1922. Events are branches established up until June 30, 1929.

Table 7
Factors Affecting the Desirability of Individual Banks as Acquisition Targets
(Duration analysis)

Dependent Variable: Time from June 30, 1922 until the bank is taken over by:

	Bank of America		Other Large Branch Bank Network		Small Branch Bank Network	
Log assets	0.6	(0.10)	57.2	(0.43)	-2.0	(0.22)
Interest bearing to total assets	-2.3***	(0.01)	-2.5	(0.04)	-1.9	(0.02)
Capital to assets	-1.0	(0.01)	11.4	(0.07)	-3.6	(0.02)
Surplus to assets	-0.9	(0.02)	36.5***	(0.12)	1.5	(0.04)
Excess capital ratio	-0.4*	(0.00)	-0.7	(0.01)	0.2	(0.01)
Cash to deposits	0.8	(0.01)	1.8	(0.04)	-2.8**	(0.01)
Demand to total deposits	-0.2	(0.00)	-1.7	(0.01)	0.6	(0.01)
State bank	-12.9	(0.25)	-81.8*	(1.04)	21.2	(0.64)
Log age of bank	9.7	(0.07)	-41.6	(0.39)	-20.6	(0.18)
Federal Reserve member	17.0	(0.21)	-58.7	(0.81)	153.1*	(0.55)
Trust	44.3	(0.30)	-33.5	(1.14)	-41.7	(0.50)
Log town population	-9.7**	(0.05)	-17.9	(0.18)	-7.8	(0.11)
Log distance to large city	-3.3	(0.05)	82.1**	(0.26)	-5.6	(0.13)
Share county income from agric.	-0.8	(0.01)	-4.3	(0)	2.6*	(0.01)
County income per capita	0.3	(0.02)	5.2	(0.15)	-7.1	(0.05)
County in the north of the state	-15.1	(0.11)	36.9	(0.57)	73.0**	(0.28)
Constant	11.90***	(1.75)	11.70	(7.93)	9.87***	(3.75)
Observations	552		552		552	
Events	152		69		56	
Log-likelihood	-346.7		-297.7		-206.0	
Likelihood Ratio Chi2	50.8		43.8		32.9	

Notes and Sources: Estimated using survival analysis and employing a log-logistic distribution. Reported values are transformed coefficients (see footnote 20). The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. Standard errors of original coefficients are in parentheses. Data on mergers, branches, bank activity, and 1922 balance sheet characteristics are from the *Annual Report* of the Superintendent of Banks of the State of CA (various years), *Rand McNally* (various years), Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years). City populations are from the California State Department of Finance (2004) County-level information is from U.S. Department of Commerce (1920). Large city is defined as either San Francisco or Los Angeles, whichever is nearer. Large branch bank network refers to Security-First National Bank, American Trust Bank, and California Bank. Observations are the number of unit banks in existence as of June 30, 1922. Events are acquisitions that took place between June 30, 1922 and June 30, 1929.

Table 8 – Characteristics of Bank Acquisitions in Small Municipalities (Population 20,000 or less)
(Duration analysis)

Dependent Variable: Time from June 30, 1922 until the bank is taken over by:

	Bank of America			Other Large Branch Bank Network			Small Branch Bank Network		
Log assets	-1.4	(0.14	)	-74.2**	(0.67	)	37.3	(0.39	)
Interest bearing to total assets	-2.1**	(0.01	)	-1.4	(0.04	)	-2.8	(0.02	)
Capital to assets	-0.8	(0.01	)	4.4	(0.08	)	-2.8	(0.03	)
Surplus to assets	-0.6	(0.02	)	48.4***	(0.14	)	3.3	(0.05	)
Excess capital ratio	-0.6**	(0.00	)	-0.3	(0.01	)	0.0	(0.01	)
Cash to deposits	-0.1	(0.01	)	-0.4	(0.04	)	-3.1**	(0.02	)
Demand to total deposits	0.0	(0.00	)	-1.4	(0.01	)	0.9	(0.01	)
State bank	-15.5	(0.27	)	-65.2	(1.08	)	-6.8	(0.88	)
Log age of bank	10.4	(0.07	)	-2.0	(0.41	)	-28.7	(0.22	)
Federal Reserve member	22.8	(0.25	)	-33.3	(0.96	)	105.8	(0.86	)
Trust	24.3	(0.41	)	360.1	(1.96	)	-43.2	(0.94	)
Log town population	-13.9**	(0.07	)	-6.6	(0.31	)	-9.8	(0.18	)
Log distance to large city	3.5	(0.07	)	103.7**	(0.35	)	-14.2	(0.20	)
Share county income from agric.	-9.0	(0.27	)	1014.7**	(1.15	)	-47.4	(1.15	)
County income per capita	0.0	(0.02	)	-3.2	(0.18	)	-5.7	(0.06	)
County in the north of the state	-16.5	(0.12	)	235.2*	(0.70	)	61.4	(0.32	)
Constant	20.8	(26.6	)	-213.2*	(115.1	)	73.7	(114.0	)
Observations	451			451			451		
Events	126			54			39		
Log-likelihood	-279.0			-220.1			-148.6		
Likelihood Ratio Chi2	55.0			63.8			25.3		

Notes and Sources: Estimated using survival analysis and employing a log-logistic distribution. Reported values are transformed coefficients (see footnote 20). The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. Standard errors of original coefficients are in parentheses. Data on mergers, branches, bank activity, and 1922 balance sheet characteristics are from the *Annual Report* of the Superintendent of Banks of the State of CA (various years), *Rand McNally* (various years), Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years). City populations are from the California State Department of Finance (2004) County-level information is from U.S. Department of Commerce (1920). Large city is defined as either San Francisco or Los Angeles, whichever is nearer. Large branch bank network refers to Security-First National Bank, American Trust Bank, and California Bank. Observations are the number of unit banks in existence as of June 30, 1922. Events are acquisitions that took place between June 30, 1922 and June 30, 1929.

Table 9 – Characteristics of Bank Acquisitions in Large Municipalities (Population 20,000 or more)
(Duration analysis)

Dependent Variable: Time from June 30, 1922 until the bank is taken over by:

	Bank of America		Other Large Branch Bank Network		Small Branch Bank Network	
Log assets	-16.7	(0.19)	416.9**	(0.80)	-17.1	(0.37)
Interest bearing to total assets	-1.5	(0.02)	-0.6	(0.08)	3.7	(0.05)
Capital to assets	-2.1	(0.04)	1.9	(0.12)	4.1	(0.09)
Surplus to assets	0.1	(0.06)	57.8	(0.30)	-5.0	(0.09)
Excess capital ratio	0.6	(0.01)	0.1	(0.02)	0.1	(0.01)
Cash to deposits	4.7*	(0.03)	-3.1	(0.08)	0.7	(0.03)
Demand to total deposits	-1.1	(0.01)	-4.8*	(0.03)	0.1	(0.01)
State bank	13.2	(0.50)	-95.1	(2.39)	71.9	(1.16)
Log age of bank	0.8	(0.20)	-83.2*	(0.95)	0.3	(0.39)
Federal Reserve member	20.1	(0.39)	11.2	(1.48)	79.5	(0.78)
Trust	85.2	(0.48)	-98.7**	(2.04)	-46.6	(0.78)
Constant	11.7***	(3.5)	-5.09	(13.4)	8.15	(7.7)
Observations	102		102		102	
Events	27		15		17	
Log-likelihood	-59.4		-56.8		-55.5	
Likelihood Ratio Chi2	14.5		21.3		6.8	

Notes and Sources: Estimated using survival analysis and employing a log-logistic distribution. Reported values are transformed coefficients (see footnote 20). The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. Standard errors of original coefficients are in parentheses. Data on mergers, branches, bank activity, and 1922 balance sheet characteristics are from the *Annual Report* of the Superintendent of Banks of the State of CA (various years), *Rand McNally* (various years), Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years). City populations are from the California State Department of Finance (2004) County-level information is from U.S. Department of Commerce (1920). Large city is defined as either San Francisco or Los Angeles, whichever is nearer. Large branch bank network refers to Security-First National Bank, American Trust Bank, and California Bank. Observations are the number of unit banks in existence as of June 30, 1922. Events are acquisitions that took place between June 30, 1922 and June 30, 1929.

Table 10
The Effects of Branch-Bank Entry on Rival Bank Behavior
(Ordinary Least Squares)

Dependent Variable: Balance-sheet characteristics listed in column heading

	Loans to Assets		Securities to Assets		Net Worth to Assets		Demand Deposits to Total Deposits	
Intercept	0.02	(0.16)	0.12	(0.15)	-0.24***	(0.07)	-0.09	(0.18)
B of A adds a branch	0.05***	(0.02)	-0.04**	(0.02)	0.00	(0.01)	0.04*	(0.02)
Other large bank adds a branch	0.05*	(0.03)	-0.08***	(0.03)	-0.01	(0.01)	0.00	(0.04)
Small bank adds a branch	0.08*	(0.04)	-0.02	(0.04)	0.00	(0.02)	0.07	(0.05)
Federal Reserve Member	-0.02	(0.05)	0.01	(0.05)	0.04*	(0.02)	0.01	(0.06)
Log Age of Bank	-0.02**	(0.01)	-0.01	(0.01)	0.04***	(0.00)	0.02	(0.01)
Trust	0.01	(0.06)	0.03	(0.06)	-0.02	(0.03)	-0.03	(0.07)
State Bank	0.02	(0.05)	0.02	(0.05)	0.01	(0.02)	0.05	(0.06)
Population Growth Rate (city)	-0.02**	(0.01)	0.03***	(0.01)	0.00	(0.00)	-0.03**	(0.01)
Log Distance to Large City	-0.05	(0.01)	0.03***	(0.01)	-0.01**	(0.00)	0.01	(0.01)
Share County Income from Agriculture	0.16	(0.16)	-0.19	(0.15)	0.12*	(0.07)	-0.11	(0.18)
County in the North of the State	0.04**	(0.02)	-0.01	(0.02)	0.01	(0.01)	-0.02	(0.02)
Observations	244		244		244		244	
F-Stat	5.57		3.56		9.21		1.81	
Adj R2	0.17		0.10		0.27		0.04	

Notes and Sources: The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. Standard errors are in parentheses. Data on balance sheets, trust status, and branching activity are from the *Annual Report* of the Superintendent of Banks of the State of California (various years) and Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years), with information on branching activity supplemented using internal records of the Bank of America. Federal Reserve membership and age of bank are from Rand McNally (1922). City population is from the California State Department of Finance (2004) supplemented by data from Rand-McNally. Income shares are from U.S. Department of Commerce (1920). Designation of county as being in northern or southern part of state is based on Secrist (1930). Observations are California unit banks in existence on both June 30, 1922 and June 30, 1929.

Dependent Variable: Balance-sheet characteristics listed in column heading

	Loans to Assets		Securities to Assets		Net Worth to Assets		Demand Deposits to Total Deposits	
Intercept	0.03	(0.16)	0.11	(0.14)	-0.24***	(0.07)	-0.10	(0.18)
One large bank has a branch	0.05***	(0.02)	-0.03*	(0.02)	0.00	(0.01)	0.03	(0.02)
Two large banks have branches	0.07**	(0.03)	-0.09***	(0.03)	-0.01	(0.01)	0.04	(0.04)
Three large banks have branches	0.01	(0.10)	-0.01	(0.09)	0.03	(0.04)	0.02	(0.11)
Federal Reserve Member	-0.02	(0.05)	0.02	(0.05)	0.04*	(0.02)	0.01	(0.06)
Log Age of Bank	-0.02**	(0.01)	-0.01	(0.01)	0.04	(0.00)	0.02*	(0.01)
Trust	0.00	(0.06)	0.03	(0.06)	-0.02	(0.03)	-0.05	(0.07)
State Bank	0.02	(0.05)	0.03	(0.05)	0.02	(0.02)	0.05	(0.06)
Population Growth Rate (city)	-0.02**	(0.01)	0.03***	(0.01)	0.00	(0.00)	-0.02**	(0.01)
Log Distance to Large City	-0.04	(0.01)	0.03***	(0.01)	-0.01**	(0.00)	0.01	(0.01)
Share County Income from Agriculture	0.15	(0.16)	-0.17	(0.15)	0.12*	(0.07)	-0.11	(0.18)
County in the North of the State	0.04**	(0.02)	-0.01	(0.02)	0.01	(0.01)	-0.02	(0.02)
Observations	244		244		244		244	
F-Stat	5.16		3.76		9.2		1.5	
Adj R2	0.16		0.11		0.27		0.02	

Notes and Sources: The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. Standard errors are in parentheses. Data on balance sheets, trust status, and branching activity are from the *Annual Report* of the Superintendent of Banks of the State of California (various years) and Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years), with information on branching activity supplemented using internal records of the Bank of America. Federal Reserve membership and age of bank are from Rand McNally (1922). City populations are from the California State Department of Finance (2004) supplemented by data from Rand McNally's. Income shares are from U.S. Department of Commerce (1920). Designation of county as being in northern or southern part of state is based on Secrist (1930). Observations are California unit banks in existence on bothJune 30, 1922 and June 30, 1929.

Table 12
The Effects of Branch-Bank Entry on Rival Bank Behavior Correcting for Possible Selection Bias
(Two-Stage OLS, Bootstrapped Results)

Dependent Variable: Balance-sheet characteristics listed in column heading

	Loans to Assets		Securities to Assets		Net Worth to Assets		Demand Deposits to Total Deposits	
Intercept	1.61	(3.15)	-0.09	(2.55)	-0.22	(1.00)	-2.02	(6.29)
B of A adds a branch	0.07**	(0.03)	-0.06**	(0.03)	0.00	(0.01)	0.10***	(0.04)
Other large bank adds a branch	0.06**	(0.03)	-0.09***	(0.03)	-0.01	(0.01)	0.03	(0.04)
Small bank adds a branch	0.08***	(0.03)	-0.03	(0.02)	0.00	(0.01)	0.06	(0.05)
Treatment Factor	-0.01	(0.02)	0.02	(0.01)	0.00	(0.01)	-0.05**	(0.02)
Federal Reserve Member	-0.02	(0.04)	0.02	(0.04)	0.04**	(0.02)	0.00	(0.04)
Log Age of Bank	-0.02*	(0.01)	-0.01	(0.01)	0.04***	(0.01)	0.01	(0.01)
Trust	0.02	(0.04)	0.03	(0.03)	-0.02	(0.02)	-0.05	(0.08)
State Bank	0.03	(0.04)	0.01	(0.03)	0.01	(0.01)	0.06	(0.04)
Population Growth Rate (city)	-0.02***	(0.01)	0.03***	(0.01)	0.00	(0.01)	-0.03***	(0.01)
Log Distance to Large City	-0.04***	(0.01)	0.03***	(0.01)	-0.01**	(0.00)	0.01	(0.01)
Share County Income from Agriculture	-1.46	(3.17)	0.05	(2.57)	0.11	(1.00)	1.80	(6.31)
County in the North of the State	0.04**	(0.02)	-0.01	(0.02)	0.01	(0.01)	-0.02	(0.02)
Bootstrap Repetitions	250		250		250		250	

Notes and Sources: The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. Standard errors are in parentheses. Data on balance sheets, trust status, and branching activity are from the *Annual Report* of the Superintendent of Banks of the State of California (various years) and Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years), with information on branching activity supplemented using internal records of the Bank of America. Federal Reserve membership and age of bank are from Rand McNally (1922). City population is from the California State Department of Finance (2004) supplemented by data from Rand-McNally. Income shares are from U.S. Department of Commerce (1920). Designation of county as being in northern or southern part of state is based on Secrist (1930). Observations are California unit banks in existence on both June 30, 1922 and June 30, 1929.

Table 13
The Effects of Multiple Branch Networks on Rival Bank Behavior Correcting for Possible Selection Bias
(Two-Stage OLS, Bootstrapped Results)

Dependent Variable: Balance-sheet characteristics listed in column heading

	Loans to Assets		Securities to Assets		Net Worth to Assets		Demand Deposits to Total Deposits	
Intercept	1.07	(3.39)	0.26	(2.86)	-0.16	(1.10)	-3.48	(7.09)
One large bank has a branch	0.07*	(0.04)	-0.06*	(0.03)	-0.01	(0.01)	0.07*	(0.04)
Two large banks have branches	0.07**	(0.03)	-0.11***	(0.03)	-0.01	(0.01)	0.07*	(0.04)
Three large banks have branches	0.01	(0.04)	-0.01	(0.05)	0.02	(0.02)	0.02	(0.05)
Treatment Factor	-0.01	(0.02)	0.02	(0.02)	0.00	(0.01)	-0.03	(0.02)
Federal Reserve Member	-0.02	(0.04)	0.02	(0.03)	0.04**	(0.02)	0.01	(0.04)
Log Age of Bank	-0.02	(0.01)	-0.01	(0.01)	0.04***	(0.01)	0.02	(0.01)
Trust	0.00	(0.04)	0.03	(0.04)	-0.02	(0.02)	-0.07	(0.09)
State Bank	0.03	(0.04)	0.02	(0.03)	0.02	(0.02)	0.05	(0.04)
Population Growth Rate (city)	-0.02***	(0.01)	0.03***	(0.01)	0.00	(0.01)	-0.03***	(0.01)
Log Distance to Large City	-0.04***	(0.01)	0.03***	(0.01)	-0.01**	(0.00)	0.01	(0.01)
Share County Income from Agriculture	-0.93	(3.41)	-0.30	(2.88)	0.04	(1.10)	3.26	(7.12)
County in the North of the State	0.04**	(0.02)	-0.01	(0.02)	0.01	(0.01)	-0.01	(0.02)
Bootstrap Repetitions	250		250		250		250	

Notes and Sources: The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. Standard errors are in parentheses. Data on balance sheets, trust status, and branching activity are from the *Annual Report* of the Superintendent of Banks of the State of California (various years) and Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years), with information on branching activity supplemented using internal records of the Bank of America. Federal Reserve membership and age of bank are from Rand McNally (1922). City populations are from the California State Department of Finance (2004) supplemented by data from Rand McNally's. Income shares are from U.S. Department of Commerce (1920). Designation of county as being in northern or southern part of state is based on Secrist (1930). Observations are California unit banks in existence on both June 30, 1922 and June 30, 1929.

Table 14
The Effect of the Branch Banks on Bank Failures, 1929-33
(Duration Analysis)

Dependent variable: Time from June 30, 1929 until failure.

	By Branch Bank			By number of branch banks		
B of A in city [t]	68.13**	(0.23	)			
Other large bank in city [t]	-0.32	(0.22	)			
Small bank branch in city [t]	34.00	(0.27	)			
Branch of one large bank [t]				46.91*	(0.22	)
Branch of two large banks [t]				89.45*	(0.38	)
Branch of three large banks [t]				32.46	(0.41	)
Log assets	-15.26	(0.17	)	-10.60	(0.16	)
Loans to assets	-1.58	(0.02	)	-1.73	(0.02	)
Securities to assets	-2.13	(0.02	)	-2.22	(0.02	)
Capital to assets	-4.23*	(0.03	)	-3.76	(0.03	)
Surplus to assets	9.28**	(0.03	)	8.87**	(0.04	)
Excess capital	0.75*	(0.00	)	0.61	(0.00	)
Cash to deposits	-0.84	(0.02	)	-0.75	(0.02	)
Demand to total deposits	-0.09	(0.00	)	-0.10	(0.00	)
State Bank	-19.32	(0.54	)	-17.03	(0.55	)
Log age of bank	-5.10	(0.11	)	-4.86	(0.11	)
Federal Reserve member	18.17	(0.54	)	14.87	(0.55	)
Trust	18.85	(0.58	)	17.02	(0.60	)
Log city population	-9.32*	(0.05	)	-4.67	(0.06	)
Log distance to large city	0.00	(0.00	)	0.03	(0.00	)
Agricultural income share	-6.67	(0.14	)	-4.00	(0.08	)
Unemployment rate	-7.63*	(0.05	)	-8.32*	(0.05	)
Constant	19.78	(14.15	)	16.05*	(8.37	)
Observations	292			292		
Failures	60			60		
Log Likelihood	-154.5			-155.7		

Note. Estimated using survival analysis and employing a log-logistic distribution. Reported values are transformed coefficients (see footnote 20). The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. The symbol [t] indicates that the variable is updated. Standard errors of original coefficients are in parentheses. Data on balance sheets, trust status, and branching activity are from the *Annual Report* of the Superintendent of Banks of the State of California (various years) and Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years), with information on branching activity supplemented using internal records of the Bank of America. Federal Reserve membership and age of bank are from Rand McNally (1922). City populations are from the California State Department of Finance (2004) supplemented by data from Rand McNally's. Income shares and county-level characteristics are from U.S. Department of Commerce (1920, 1930). Designation of county as being in northern or southern part of state is based on Secrist (1930). Observations are the number of banks in existence as of June 30, 1929. Failures indicate banks failing between June 30, 1929 and March 1, 1933.

Table 15
The Effect of the Branch Banks on Bank Failures (1929-33) Correcting for Possible Selection Bias
(Two-Stage Duration Analysis, Bootstrapped Results)

Dependent variable: time from June 30, 1929 until failure.

	By Branch Bank		By number of branch banks	
B of A in city	193.33**	(0.46)		
Other large bank in city	46.44	(0.35)		
Small bank branch in city	67.48	(0.48)		
Branch of one large bank			214.69**	(0.56)
Branch of two large banks			293.08*	(0.74)
Branch of three large banks			749.62	(1.39)
Treatment Factor	-29.80	(0.22)	-35.45*	(0.24)
Log assets	-42.57*	(0.30)	-35.32*	(0.26)
Loans to assets	-3.71	(0.04)	-4.68	(0.04)
Securities to assets	-4.38	(0.04)	-5.25	(0.04)
Capital to assets	-8.37*	(0.05)	-7.48*	(0.04)
Surplus ot assets	12.44*	(0.07)	10.84*	(0.06)
Excess capital	1.48**	(0.01)	1.30**	(0.01)
Cash to deposits	-0.78	(0.03)	-1.12	(0.03)
Demand to total deposits	-0.52	(0.01)	-0.33	(0.01)
State Bank	6232.02	(5.59)	4565.12	(5.77)
Log age of bank	-10.14	(0.12)	-7.91	(0.12)
Federal Reserve member	11065.63	(5.64)	7768.18	(5.79)
Trust	1975.31	(4.74)	2063.14	(4.77)
Log city population	-9.42	(0.15)	-6.70	(0.15)
Log distance to large city	24.50	(0.19)	31.63	(0.18)
Agricultural income share	-16.12	(0.25)	-20.57	(0.26)
Unemployment rate	-4.02	(0.09)	-4.98	(0.08)
Constant	32.23	(26.19)	36.71	(27.15)
Bootstrap Repetitions	250		250	

Note. Estimated using survival analysis and employing a log-logistic distribution. Reported values are transformed coefficients (see footnote 20). The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. All independent variables are initial values. Standard errors of original coefficients are in parentheses. Data on balance sheets, trust status, and branching activity are from the *Annual Report* of the Superintendent of Banks of the State of California (various years) and Comptroller of Currency *Annual Report* and *Statements of Conditions* (various years), with information on branching activity supplemented using internal records of the Bank of America. Federal Reserve membership and age of bank are from Rand McNally (1922). City populations are from the California State Department of Finance (2004) supplemented by data from Rand McNally's. Income shares and county-level characteristics are from U.S. Department of Commerce (1920, 1930). Designation of county as being in northern or southern part of state is based on Secrist (1930). Observations are the number of banks in existence as of June 30, 1929. Failures indicate banks failing between June 30, 1929 and March 1, 1933.