The Effects of Banking Competition on Growth and Financial Stability: Evidence from the National Banking Era*

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Abstract

How do restrictions on banking competition affect credit provision and economic output? And, how do they affect financial stability? To identify the causal effect of banking competition, we exploit a peculiarity of bank capital regulation in the National Banking Era: opening banks in towns with more than 6,000 inhabitants required twice the equity as in towns below this threshold, thus leading to a locally exogenous variation of entry barriers. We construct a novel comprehensive data set comprising the annual balance sheets of all national banks, and link it with the results of the decennial census. We show that initially, banks in markets with lower entry barriers extended more credit and chose a higher leverage, leading to a local credit boom that was associated with an expansion in the local manufacturing industry. However, banks in markets with lower entry barriers were also more likely to default or go out of business during or soon after a major financial crisis, the Panic of 1893. Our evidence suggests that banking competition supports economic growth by inducing credit provision, but may increase the risk of financial instability by increasing bank risk-taking.

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1 Introduction

How does competition in banking affect credit provision and financial stability? And how does it affect real economic outcomes? Despite the importance of these questions to academics and policy makers, there is only limited consensus about their answers. In theory, it is plausible for competition among banks to either increase or decrease, both, credit provision and risk taking.[1] Therefore, the nature of the questions asked becomes necessarily empirical. Existing empirical studies for the U.S. focus mostly on the deregulation of branching restrictions (see, e.g., Jayaratne and Strahan, 1996, 1998; Black and Strahan, 2002; Dick and Lehnert, 2010; Jiang et al., 2016). However, identifying the causal effect of bank competition empirically is generally challenging as competition and concentration are typically not exogenous. Hence, the inference on the causal effects of competition can be constrained by confounding factors such as the ability of banks to diversify (Goetz et al., 2016) and a complex interplay of bank mergers and political economic forces (Agarwal et al., 2012; Calomiris and Haber, 2014).

In this paper, we provide novel evidence to improve the understanding of the causal effects of banking competition on credit, financial stability, and real economic outcomes by studying the National Banking Era. There are three main reasons why the National Banking Era constitutes a close to ideal laboratory. First, the absence of a central bank, of deposit insurance, and of any bailout prospects imply that banks' behavior is not governed by the anticipation of government interventions. Second, the prevalence of unit banking ensures that banking markets are local, allowing to compare different, arguably independent markets. Finally, third, the peculiarities of minimum capital requirements for national bank entrants give rise to local exogenous variation in the barriers to entry.

In particular, rather than specifying a minimum capital ratio relative to assets, as contemporary capital regulation does, capital regulation during the National Banking Era required shareholders to raise a minimum dollar amount of equity at the founding of a bank. Moreover, the minimum amount required varied with the population of a bank's place of operation as determined by the decennial census. For example, founding a bank in a town with more than 6,000 registered local population required the partners of the bank to invest twice the minimum capital that was required in towns with up to 6,000 inhabitants. Hence, fairly similar local markets above and below this threshold had quite

[1] With respect to credit volumes, an increase in competition can cause bank credit to increase if deposit supply is upward sloping and loan demand downward sloping (Klein, 1971), but can contract credit if it reduces banks' incentives to invest in banking relationships (Petersen and Rajan, 1995). With respect to risk taking, competition may result in riskier banks if it gives banks incentives to take more risk if their charter values decline (Keeley, 1990; Matutes and Vives, 1996; Allen and Gale, 2004), or less risky banks if competition reduces loan rates and thus reduces moral hazard on the part of borrowers (Boyd and De Nicolo, 2005).

different minimum capital requirements for national banks entering the market. Given this structure of the capital regulation, we use revisions of population estimates after census publications to identify the effects of changes in the barriers to entry on bank behavior.

Importantly, the regulatory framework further determined that changes in the required capital following a census publication only applied to newly founded banks, but not to incumbent banks. This is particularly attractive from the viewpoint of identification as differential behavior of incumbent banks across markets with different barriers to entry can only derive from changes in the requirements for new entrants, but not from differential regulatory treatment of incumbents.[2] Hence, this allows us to isolate the change in bank behavior that stems from differences in entry barriers for competitors alone.

To conduct our investigation, we construct a novel data set that consists of all national bank balance sheets from 1871 throughout 1896. We focus on the impact of the publication of the 1880 census as the source of variation in barriers to entry and compare outcomes in cities that start with less than 6,000 inhabitants in 1870 and subsequently cross this threshold with outcomes in cities with a population that stayed below 6,000.

Being subject to higher barriers to entry after the census publication, however, may not be entirely exogenous. Mechanically, towns that crossed the threshold in 1880 either had a higher population in 1870, a higher growth rate between 1870 and 1880, or both. Hence, without additional controls, differences in outcomes might be driven by the same factors that pushed the population to grow above the threshold. We address the important concern that results may be driven by factors other than barriers to entry in three ways. First, all regressions include controls for both the initial levels of population and for population growth as well as other observable differences. Second, we provide evidence that treated and non-treated cities are comparable among a number of important observable characteristics, such as their degree and pre-trends of industrialization and banking access prior to the publication of the census, their degree of railroad access, as well as the average banks' age. Third, we control for unobservable local economic conditions by adding county–level fixed effects, comparing cities located in the same county and geographically close to each other, but subject to different barriers of entry.

Our analysis then has three parts. First, we verify that towns that cross the threshold experience lower entry over the course of the next ten years, from 1881 to 1891, which indicates that the barriers to entry are economically meaningful and affect the degree of local competition. Our findings are in line

[2]Differences in the required capital may for instance result in differences in the ownership structure, which in turn is an important determinant of bank governance (see, e.g., Calomiris and Carlson, 2016).

with hypothesis developed by Sylla (1969) and James (1978) that capital requirements hindered bank entry during the National Banking Era. In particular, we show that towns with exactly one national bank in 1881 and higher entry costs thereafter have an around 35% lower probability of an additional national bank entering the market. Entrants, however, also have the option of avoiding the regulatory requirements by entering the market under a non-national, state charter. When we consider the entry of state chartered institutions, we estimate that markets with higher barriers to entry have a higher chance of seeing an additional such institution entering. However, on net, markets with higher capital requirements for national banks have around 0.2 fewer banks of any type — in line with the notion that state banks and national banks are not perfect substitutes (see, e.g., Barnett, 1911; White, 1983).

In the second part of the analysis, after establishing that the publication of the census predicts bank entry, we compare the behavior of incumbent national banks across the different types of markets. We start by considering indicators of credit availability. We document that, after the publication of the census and through the next 10 years, incumbent banks operating in markets with higher barriers to entry increase their loan portfolio at an around 20 percentage points lower rate than their peers in markets with lower barriers to entry. Our results are therefore consistent with the idea that banks with more market power restrict rather than increase credit provision.

A particular advantage of our empirical setting is that our data also allow us to study whether differences in bank behavior are a response to actual entry or driven by the threat of potential entry only. We present two empirical facts that suggest that deterrence of potential entrants is a driver of bank behavior. First, we test our main empirical specification for a restricted sample of banks that are in towns that do not actually see an additional entrant throughout 1881 and 1891 and hence remain monopolists in either markets. Our results indicate that the differential behavior after the increase in barriers to entry across the two types of markets remains, even when restricting the sample to banks that remain monopolists throughout the sample period. Second, when studying the dynamics in credit provision across markets with different entry barriers, we find that credit provision decreases immediately after the publication in markets with higher barriers to entry. Given that actual additional entry only occurs after time has passed, this is an indication that incumbent banks attempt to deter banks from entering by increasing credit provision in their local market. Both findings are in line with predictions from the theoretical literature on entry deterrence (see, e.g., Dixit, 1979; Milgrom and Roberts, 1982a,b; Klemperer, 1987) as well as more recent empirical evidence from the airline industry (see, e.g., Goolsbee and Syverson, 2008).

Considering banks' risk taking behavior, we find that incumbent banks in markets with higher entry barriers take less risk than their peers in more competitive markets. In particular, we show that the levels of equity relative to assets and loans—the riskiest component of bank's assets—are higher in markets with higher entry barriers. If loan portfolios had a similar risk profile across the different types of markets, this finding would imply that banks in the towns with higher entry barriers indeed follow a safer business model.

Given the we cannot directly observe the risk characteristics of loan portfolios, we also consider ex-post measures of risk taking and show that incumbent banks in cities with lower barriers to entry tended to have on average more seized collateral on their balance sheets than banks in towns with higher barriers to entry. In addition, we study bank failure rates during and after the Panic of 1893, one of the most severe financial shocks during the National Banking Era, that was followed by a period of dismal economic performance. We find that failure rates of incumbent banks were around 1 percentage point lower in the less competitive towns around the Panic, an economically significant effect given the unconditional default probability of 2.1%. Both, more bad loans and higher failure rates are consistent with greater risk taking. Altogether, we find that limits on entry and hence restraining competition tended to restrict credit provision but support financial stability (see, e.g., Corbae and Levine, 2018).

Moreover, we find that banks in towns with higher barriers to entry were are less likely to voluntarily liquidate their business during times of financial distress. Voluntary liquidation is means to protect the bank owners to wind down their bank while protecting them from their double liability. The lower propensity to voluntarily liquidate in market with higher barriers to entry is in line with theories of market power increasing charter value. Banks with higher charter value have less incentive to take risk and need not expand credit as rapidly—either because they are more cautious about their customers or less concerned about having to protect their market share. This is precisely the behavior we observe in areas with higher entry barriers.

Finally, in the third part of our analysis, we look at real economic outcomes. In particular, we investigate whether growth in manufacturing varied across markets with different barriers to entry. In line with existing findings that financial conditions matter for real economic outcomes (see, e.g., Peek and Rosengren, 2000; Chodorow-Reich, 2014; Benmelech et al., 2017), we find that additional credit provision by national banks led to real economic growth: Markets with higher barriers to national bank entry experience a 28 percentage points lower growth rate in manufacturing capital and 20 percentage point lower growth rate in manufacturing output between 1880 and 1890. Our results hence suggest

competition creates a tension between credit availability and financial stability. We find that banks in areas with more potential competition appear to have made credit more easily available which in turn appears associated with increased economic growth (in line with existing evidence by, e.g., Cetorelli and Gambera, 2001), but also to have taken more risk and been more likely to fail. This tension is consistent with findings in other recent work, such as Rancière et al. (2008); Schularick and Taylor (2012); Rajan and Ramcharan (2015); Mian et al. (2017); Jaremski and Wheelock (2017).

The rest of the paper proceeds as follows: We review the related literature in Section 2, before describing our data set in more detail in Section 3. We then provide background on how we use the capital regulation during the National Banking Era to identify the causal effects of banking competition in Section 4. We then first study the effect on entry in Section 5, the effect in bank behavior in Section 6, and the effects in the real economy in Section 7, before Section 8 concludes.

2 Related Literature

The effect of competition on bank behavior has been studied extensively, although no ultimate consensus has emerged. Theoretical predictions are sensitive to the assumptions made about the nature of banking. With respect to credit availability and lending volume, an increase in competition will also increase the volume of loans and deposits whenever banks face upward-sloping deposit supply curves and downward-sloping loan demand curves (Klein, 1971). However, if the nature of banking is more complex and the role of relationships is larger, the opposite may be true and competition among banks may decrease overall credit. For instance, if lending requires high initial monitoring efforts, competition will prevent banks from extracting future rents from borrowers, which might reduce lending or prevent it altogether (see, e.g., Petersen and Rajan, 1995).[3] Finally, when both forces are active at the same time, the net effect of banking competition on credit may vary with the degree of development of an economy (see, e.g., Cetorelli and Peretto, 2012).

Likewise, theory has ambiguous predictions with respect to risk taking. Competition potentially increases bank risk taking, as it may decrease the charter value of banks and hence destroy the incentives of bankers to behave prudently. (see, e.g., Keeley, 1990; Allen and Gale, 2004; Corbae and Levine, 2018).[4] Yet other theories predict that competition decreases the overall riskiness of bank lending as by reducing

[3] Another, related argument is made by Marquez (2002), who shows that competition among banks increases information dispersion, impacting banks' screening ability.

[4] See also Repullo (2004) and Matutes and Vives (1996).

interest rates, moral hazard on behalf of bank borrowers is mitigated (see, e.g., Boyd and De Nicolo, 2005). Combining both arguments, Martinez-Miera and Repullo (2010) show that the relationship of competition and risk taking is U-shaped.

Given the sensitivity of theoretical predictions, empirical evidence becomes even more important. There are a number of key contributions that indicate that competition — while increasing the efficiency of bank management and bank stability — does not necessarily increase credit provision. For example, classic empirical evidence by Petersen and Rajan (1994, 1995) shows that young firms can borrow at lower rates in more concentrated markets, which suggests a higher credit availability in less competitive markets. Further, a series of seminal empirical papers exploit the removal of branching restrictions to identify the effect of competition, see in particular Jayaratne and Strahan (1996, 1998). These papers show that the deregulation of branching increases the threat of takeovers and thereby induces bank managers to make more efficient lending decisions. Additional evidence by Dick and Lehnert (2010) shows that even though bankruptcy rates increase with increased competition, banks perform better due to decreasing loss rates on loans. However, the overall evidence also suggests that while the deregulation of branching restrictions leads to better bank management, it does not necessarily lead to more credit provision.[5]

Given the increase in the efficiency in bank management through the threat of takeover as well as improved transparency and monitoring of banks (Jiang et al., 2016), the lifting of branch restrictions also led to an increase in the overall safety of the banking system (Jayaratne and Strahan, 1998). Similarly, Carlson and Mitchener (2009) find beneficial effects of increased competition on financial stability in the 1930s. In particular, they show that that banks that faced competition from a large, diversified bank either became more efficient—and thus more likely survive a large shock—or exited the market. By contrast, Berger and Hannan (1998) observe less failures in monopolistic markets, but argue this is due to a lack of market discipline which in turn reduces overall efficiency of the banking system.

[5]Jayaratne and Strahan (1996) find some indications that credit supply may have increased, but argue that the finding is not robust. Dick and Lehnert (2010) and Mian et al. (2017) find an increase in credit provision to households in the context of the lifting of branching restrictions. Moreover, additional evidence by Gissler et al. (2018) find that competition by credit unions leads to an increase in credit provision to households by banks.

Moreover, the real economic effects of increased banking competition are studied by Black and Strahan (2002) and Cetorelli and Strahan (2006), who show that less concentration in the banking sector induces concentration to decline among banks' creditors. Further important papers on the real effects of branching restrictions are Stiroh and Strahan (2003), Zarutskie (2006), Rice and Strahan (2010), and Cetorelli (2014). Additional evidence from France on the real effect of banking competition is provided by Bertrand et al. (2007), who show that liberalization of the banking industry makes banks less likely to bail out under-performing firms, thereby increasing the efficiency of the firm sector. Finally, more recent papers use changes in local concentration resulting from bank mergers to instrument competition, (see, e.g., Scharfstein and Sunderam, 2014; Liebersohn, 2017).

Studying the effects of banking competition by exploiting the lifting of branching restrictions — while extremely useful and important — is, however, naturally limited by a series of factors. First, the lifting of branching restrictions took place in an environment in which deposit insurance and the prospect of bank bailouts might have influenced bank behavior, potentially masking the raw effects of competition. Second, while the lifting of branching restrictions arguably increased local banking competition, it also changed the banking landscape through a number of other channels. As argued above, it changes the ability of banks to diversify (Goetz et al., 2016) and thus potentially influences bank risk-taking. Moreover, in the particular case of the U.S., it is associated with a wave of bank mergers that are in a complex interplay with other political economic forces (Agarwal et al., 2012; Calomiris and Haber, 2014).

Therefore, we argue that our paper's empirical setting has two key advantages over existing studies on the effect of banking competition. First, local variations in entry cost during the National Banking Era do not coincide with variations in other market characteristics, such as the ability to diversify across markets. Second, given the absence of ex-ante and ex-post government interventions, it allows us to provide evidence on the effects of competition that occur in absence of any government interventions.

The differences in the empirical setup hence also explain the differences in findings to the existing literature. In contrast to the general leaning in the literature on the lifting of branching restrictions, we find strong indications that banks in more competitive areas tend to provide more credit availability. In particular, we find that lower barrier to entry lead to an increase in credit provision as incumbents try to deter new entrants. Hence, our evidence suggests that bank behavior resembles behavior of non-financial firms in other markets (see, e.g., Goolsbee and Syverson, 2008). Furthermore, we find that banks in more competitive areas tend to choose riskier balance sheets, resulting in more bank failures. Our findings hence lend support to the notion that competition among banks increases bank risk taking (consistent with Jimenez et al., 2013; Braggion, Fabio and Dwarkasing, Narly and Moore, Lyndon, 2017; Gissler et al., 2018)[6] rather than increasing the safety of the banking system (as found in Jayaratne and Strahan, 1998; Schaeck et al., 2009; Carlson and Mitchener, 2009).

[6]Additional cross-country evidence on bank failures is provided by Beck et al. (2006), who show that more monopolistic markets see less bank failures.

3 Data

This paper combines information from five different sources, which we combine at the bank, city, and county level.

First, we start out by constructing a comprehensive, novel data set of annual balance sheets of all U.S. national banks between 1871 and 1896. Our source is the Comptroller of the Currency's Annual Report to the Congress which reports detailed balance sheet items for all national banks on an annual basis. The data are fairly granular, including – among other things – the amount of loans, securities, and reserves held, as well regulatory capital, surplus equity and undivided profits, interbank claims, and deposits outstanding. See Figure 16 in the Appendix for an example of a balance sheet.

To assemble our data set, we applied a combination of optical character recognition (OCR) and layout recognition techniques to the Annual Report. We flagged potential errors through a battery of checks, including the application of balance sheet identities and legal constraints on the balance sheet. Subsequently, all flagged observations were hand-checked. We extracted the charter number, state, county, and city of each bank, geo-located the cities, and recorded the dates of all relevant events for each bank (entry, receivership, liquidation, rechartering, etc.).

Second, we complement our data on national banks with information on the existence and location of state-chartered banks, kindly shared with us by Jaremski and Fishback (2018), who document the existence of state banks, trusts, and savings banks using the "Rand McNally's Directory of Bankers and Lawyers".

Third, the information on city names, location, and population per decennial census is based on a novel dataset by Schmidt (2017), which is itself based on the Decennial Census reports digitized by Jacob Alperin-Sheriff and by U.S. Census Bureau and Steiner (2017). In addition, corrections for city name changes, as well as city mergers (and even relocation) were done manually.

Fourth, railroad data comes from Atack (2013), which documents railroad tracks by county and year, allowing us to determine the year in which a city gains access to a railroad. A city is assumed to have access to a railroad if there is at least one railroad track passing within 10 miles of the center of a city. Moreover, as an additional statistic on railroad access, we count the railroad connections that intersect with the diameter of the a circle with a ten mile radius around the city center, referred to as a city's number of railroads.

Finally, we use real economic outcomes at the county-level from the Decennial Census, provided by

Haines (2004). In particular, the census provides information on manufacturing capital invested, the value of manufacturing products produced, as well as the number of manufacturing establishments.

4 Background and identification strategy

We start out by describing the details of capital regulation during the National Banking Era and how they can be used to identify the effect of bank competition on bank behavior.

4.1 Capital regulation and entry restrictions during the National Banking Era

During the National Banking Era, banks' leverage ratios were not directly constrained by capital regulation. Instead, regulators required a minimum *dollar amount* of equity investment (of "capital stock paid in") in order to establish a bank. After opening, banks were free to choose their own leverage subject to the willingness of depositors to keep their deposits at the bank. Therefore, as several authors have argued before us (see, e.g., Sylla, 1969; James, 1978; Jaremski, 2013; Fulford, 2015), capital requirements were a barrier to entry rather than on leverage.[7]

Branching regulations restricted banks to operate a single office in a single location or "place" and, importantly, the minimum amount of capital required to open a bank depended on the population of the bank's location. In towns with up to 6,000 inhabitants, newly founded banks were required to maintain at least $50,000 in capital. After crossing this population threshold, this requirement doubled to $100,000, and increased further to $200,000 in towns with at more than 50,000 inhabitants.[8]

[7]Note that the OCC itself saw the capital regulation governing entry of banks. In 1876, in a debate on lowering capital requirements, Jay Knox in his function as the Comptroller argued that: "*The organization of small institutions in the large cities has a tendency to weaken those already organized, and to so divide the business as to make them all more or less unprofitable to the shareholders.*", see Appendix C in the Appendix for details.

Furthermore, note that were also other regulations related to capital. For instance, national banks were subject to a "double liability" rule: in case of a bank failure, shareholders were liable to lose not only their investments in the bank, but their own personal property up to the book value of their shares (see also Grossman, 2001; Koudijs et al., 2018)

[8] Note that choosing the 6,000 threshold was a political compromise. For instance the proposed "Hooper bill" from 1862 suggested a $50,000 requirement for all locations. The "Sherman Act" of 1863 in contrast suggested to increase the capital requirement from at once a locations population exceeds 10,000 inhabitants. For details, see Davis (1910).

Further note that in 1900, the capital regulation was refined such that banks founded in towns with less 3,000 inhabitants were required only to raise $25,000 in capital paid-in, studied in more detail by Gou (2016). Moreover, banks were not allowed to pay out dividends until the bank had accumulated a surplus funds of at least 20% of the regulatory capital determined in the banks charter. See James (1978) and Champ (2007) for details.

$$\text{“Capital stock paid in”} \geq \begin{cases} \$50,000 & \text{if population } \leq 6,000 \\ \$100,000 & \text{if population } \in (6,000, 50,000] \\ \$200,000 & \text{if population } > 50,000 \end{cases}$$

There are two additional details regarding this capital requirement that turn out to key for the success of our identification strategy. First, the legal population of a place was determined by the most recently published decennial census.[9] Second, the regulatory capital requirement only applied to national banks that were entering the market, but not to incumbent national banks (“grandfather clause”), which hence did not have to increase their capital if the towns they operated in grew in population. These details are, for instance, described in the contemporary legal resource “Pratt’s Digest of the National Bank Act and Other Laws Relating to National Banks from the Revised Statutes of the United States” (Pratt, 1886):

> “*The population of a place in the United States is legally determined by the last previous census. Thus a bank organized at any time between 1880 and 1890 would generally be bound by the census of 1880. Exceptions might of course arise, as, for instance, where new towns are started in the interval, and other proof of population might then be accepted by the Comptroller. Small variations in population between censuses, would not be regarded. A bank organized with $50,000 capital in a small place might continue with that capital if the population should increase to any number. It thus sometimes happens that we find banks in some towns and cities that appear to have less than the minimum capital required by law. They were either organized when the places were smaller, or were organized in villages absorbed by cities lying near.” (page 12)*

The fact that the legal population is determined by the most recent census means that, even if the population of every town is changing constantly, the minimum requirement for entrants only changes when the census is published. In line with the regulatory statutes, Figure 1 shows that all banks in our sample that are founded between 1882 and 1891 fulfill the regulation: While banks can choose to have more capital than required, banks that are founded in cities with more than 6,000 inhabitants always have at least $100,000, whereas bank in cities with less than 6,000 inhabitants have never less

[9] The “place” could be a “city”, a “town”, a “village”, or an incorporated place enumerated in the Decennial Census. Note that the census also reported information on civil townships (confusingly, called “towns” in New England, New York and Wisconsin). Thus, in cases where two locations share the same name in a given state (e.g. Dunkirk, NY), we always select the city, town or village, and not the civil townships.

than $50,000, but potentially do have less than $100,000.[10]

[FIGURE 1 ABOUT HERE]

The fact that the capital requirement only applied to entrants means that regulatory requirements for incumbent banks are unaffected by the publication of the decennial census. I.e., if after a new census a town crossed the 6,000–person threshold , incumbent banks in the town were not required to adjust their regulatory capital. This is very attractive from the standpoint of identification as any observed changes in the behavior of incumbent banks are therefore driven by changes in the local market structure, rather than by changes in the banks' own capital structure. This is particularly important, as a change in the minimum amount of capital required may affect banks also in other ways than through competition.[11]

Finally, note that even though national banks are the predominant type of bank — for instance, in 1891, more than 75% of banking assets were held by national banks— competition can also arise form other types of financial institutions that provide similar services, such as state banks or savings banks. Therefore, it is important to emphasize that the regulatory requirements for national banks did not apply to other institutions that entered the market under a non-federal charter. As will be discussed below, higher barriers to entry for national banks provided an incentive for entry by institutions not subject to the strict regulatory requirements of national banks.

4.2 Identification

In order to study the effect of bank competition on bank behavior, we exploit that the publication changes entry barriers differentially across otherwise similar local markets. We focus on the publication of the 1880 census and the subsequent differences in bank behavior over the next decade. Focusing on this time period has the additional benefit that we can observe how the choices made by banks during the 1880s affected their performance in the Panic of 1893, one of the most severe stress events in the National Banking Era (Friedman and Schwartz, 1963).

We focus our sample by restricting it to banks in towns with less than 6,000 inhabitants according to the 1870 census and had at one or two national banks in 1881.[12] We treat 1881 as the year in which

[10]National banking regulation did allow banks to start operating when at least 50% of their stated capital was "paid in", although the owners had to pay in the remainder within five months.

[11]For instance, banks subject to the higher capital requirement may have a different ownership structure as they may need increase the number of partners to raise the capital required. In turn, differences in ownership structure are important for a bank's governance, see Calomiris and Carlson (2016).

[12]We exclude towns with three or more national banks as these towns arguably have a considerable degree of competition.

results of the 1880 census are published. Note that although the final result of the census were published on March 2, 1882, the Census Bureau provided preliminary results to local newspapers as early as July 1880. Nonetheless, we choose 1881 as the relevant publication year, as most of these early results were preliminary and referred to the population of states and larger cities, with the smaller cities in our sample more likely to be reported later.

We use towns with existing national banks as we are interested in studying the response of incumbent banks to changes in the barriers of entry to their local market. This data restriction implies that our paper focuses on the effect of adding additional banks to a town that already has one or two national banks, rather than the margin of having a bank at all or having more than two banks to begin with.

Note that our sample restrictions imply that we are studying the effect of an increase in the barriers of entry rather than a decrease in the barriers of entries. We do so as there are not enough observations to study the latter: town population is on average increasing during the episode considered and only a very small number of towns are declining such that they are subject to lower barriers of entries after a census publication. Moreover, we do not study the behavior of banks in towns that cross the 50,000 threshold as these cities become eligible for receiving reserve city status, which displays an important confounding factor.

Further, we focus on the "manufacturing belt"[13] where the banking system was relatively dense and established, and exclude the south and the west to alleviate concerns that that our results are driven by peculiarities of these regions (such as Reconstruction in the South and the frontier in the West). Moreover, as existing evidence by Jaremski (2014) shows, the manufacturing belt was the area in which national banks were the predominant form of banking and most important for economic development. Note that results are robust to using the larger sample that considers banks form all states.

We define a local market as *treated* and hence subject to higher entry costs for national banks if it had less than 6,000 inhabitants in the census of 1870, but more than 6,000 in the census of 1880. The control group consists of all cities that had less than 6,000 inhabitants in both the 1870 and the 1880 census. Formally, we define $\mathbb{1}_{\text{pop}>6,000}$ an indicator variable that takes the value one if city c passes the 6,000–person threshold in the census of 1880 and zero otherwise, i.e.,

All results are robust to including these towns

[13]Banks considered in our sample are either one of the following twenty states: Connecticut, Delaware, Illinois, Indiana, Iowa, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia.

$$\mathbb{1}_c^{\text{pop1880}>6{,}000} = \begin{cases} 1 & \text{if pop1880}_c > 6,000 \\ 0 & \text{if pop1880}_c \leq 6,000 \end{cases}.$$

We arrive at a sample of 700 cities with at least one national bank in 1881. Of those 700 cities, 59 cities are *treated* and cross the 6,000–person threshold according to the census of 1880. We are able to identify 813 national banks that exist throughout 1881 to 1891, of which 82 are in markets that are subject to higher entry costs after the publication of the census. A summary of balance sheets statistics of all banks in our sample can be found in Table 1. By 1881, around 2,000 national banks had been founded. Our final sample hence contains around 40% of all national banks in existence. The banks considered are, however, rather small country banks, see Figure 14 in the Appendix, and in total our sample covers around 20% of all assets of the national banking system in 1881.

[TABLE 1 ABOUT HERE]

In order to identify an effect of a variation of entry costs on banking behavior, the variation in entry costs would need to be purely random and hence exogenous. However, having more than 6,000 inhabitants as of 1880 and hence being subject to higher entry costs is not entirely exogenous. Cities that cross the threshold might either already have a higher population in 1870 to begin with, might have experienced a faster population growth between 1870 and 1880, or both. These differences in the evolution of a town's population in turn may be causing differences in bank entry and bank behavior after 1880. For instance, if larger towns tend to have lower economic growth rates—i.e. if growth flattens out over time—we may be simply picking up an effect of older towns having slower growth and hence less bank entry.

In order to address this first order concern about identification, Table 2 shows observable characteristics for treated and non-treated cities prior to the publication of the census.

[TABLE 2 ABOUT HERE]

Clearly there are differences in population levels. In 1870, treated cities have on average around 1,700 more inhabitants than non-treated cities. In line with the larger population, they also have higher average levels of national bank capital, deposits, outstanding loans, and overall assets.

Moreover, treated cities also have a higher population growth rate. Note that, however, a city's

population growth between 1870 to 1880 can only be calculated if the city already existed in 1870 and reported population. An alternative way of calculating population growth is to use a harmonized growth rate that allows to include towns that did not exist in 1870. The harmonized growth rates in contrast to the standard growth rates are not significantly different across the two types of towns.

Given the observable differences across treated and non-treated cities, we control for the level of population as well as for past and contemporaneous population growth. As long as our outcome variables—bank entry, loan growth, bank failure, etc.—are a continuous and approximately linear function of population, these controls will suffice. Note, however, that our results also hold when including richer population controls, such as the squares of both variables, and their interaction. These more complex population measures arguably control for the overall population trajectory of a city, and for nonlinear relationships between the outcome variables and population. Moreover our results are also robust when considering only towns closer to the 6,000–person threshold —i.e., in markets that as of 1880 had more than 3,000 but less than 9,000 inhabitants.

Reassuringly for our purposes, other than differences in the level of population, treated and non-treated cities are similar in a number of other important observable characteristics. First, trends in city-level bank characteristics prior to the 1881 census are fairly similar for the two groups of cities, as growth rates for bank assets, loans, and capital between 1871 and 1881 are not statistically different. Second, other aspects of the cities are also similar—growth rates of manufacturing capital, establishments, and output from 1870 to 1880 are quite close and both types of cities have similar per capita levels of manufacturing capital and manufacturing output in 1880. Finally, railroad access, which would facilitate trade and possibly growth, was also comparable between the two groups of cities throughout 1870, 1880, and 1890. Note however that treated cities tend to have railroad access for a longer time and have generally more railroad connections. The overall pattern is that treated towns are larger and likely to be established towns for a longer time. They are, however, having a similar

Furthermore, Figure 2 reveals that the treated cities are fairly even spatially distributed and not clustered in one specific region. Importantly, observe that there exist multiple counties with one treated and one non-treated city. Hence, in regressions, we can compare cities that are geographically close to each other but subject to different entry costs by including county fixed effects.

[FIGURE 2 ABOUT HERE]

Finally, given the differences in city size, national banks also differ among a number of observables, see Table 3. In particular, banks in treated cities are on average large. Given that the ability to diversify increases in the bank size, larger banks also have a higher leverage/lower capital to asset ratio in 1881. We control for these observable differences in all regressions at the bank level. Note, however, that cities across the different markets are on average the same age. This is important as it allows us to rule out preemptive entry in anticipation of the census driving results. To this end, consider also Figure 15 in the Appendix, which reveals that the median bank considered was already in existence at the beginning of the National Banking Era and that there is no obvious preemptive entry into markets that have higher barriers to entry after 1881.

[TABLE 3 ABOUT HERE]

5 The effects of entry costs on entry and competition

In this section, we develop and test hypotheses on how the variation in barriers to entry affected bank entry.

As argued above, an increase in the minimum capital required to open a bank acted as a local entry barrier, possibly deterring bankers from chartering a national bank in a given town or city. Thus, if these requirements were indeed economically relevant constraints, we would expect to observe less national bank entry in markets that crossed the 6,000–person threshold after the 1880 census was published.

At the same time, a larger minimum capital requirement made the founding of state-chartered banks comparatively cheaper.[14] Hence, we expect the lower number of national banks to be at least partially offset by the new state-chartered institutions. However, even though higher entry barriers only affected national banks, we still expect to observe a lower overall entry if state banks and national banks were not perfect substitutes. There are a number of reasons to believe that this was the case, as state banks had a comparative disadvantage in issuing bank notes. Moreover, given the relatively lax regulation of state banks, state bank were generally perceived as less safe institutions and not as well reputed as national banks (Barnett, 1911; White, 1983).

[14]Note that state banks also faced start-up capital requirements based on the local population. However, these requirements varied widely by state and through time. For instance, White (1983) shows that in 1895, Massachusetts had the exact same capital requirement for state bank than for national banks, whereas in New Jersey state banks where required to have $50,000 capital paid-in irrespective of the size of the location. We find some evidence that having lower state requirements than national ones mattered for entry, but no evidence that how much lower mattered.

We start out by providing visual evidence on the effect of the higher entry barriers on the degree of local competition. Figure 3 depicts a binned scatter plot of the number of new national banks in towns with exactly one national bank in 1881, grouped by city population as of the the 1880 census, and including linear fits left and right of the 6,000–person threshold . Focusing on cities with exactly one national bank has the advantage that we can directly calculate the probability of experiencing an additional entry. The picture shows that there is a positive correlation between city size and the number of entries of national banks. However, there is a sharp discontinuity right around the 6,000–person threshold . In particular, towns just above the threshold have a 30 percentage points lower probability of seeing an additional national bank entry between 1882 and 1891 than towns just left of the threshold.

In a similar spirit, Figure 4 depicts the number of national banks per town in 1891 by the population as of the 1880 census. The pattern observed confirms the visual evidence on new entrants. Figure 4 shows that a city with just less than 6,000 inhabitants has on average around 1.4 national banks in 1891, while a city just right of the threshold has on average a little less than 1.1 national banks in 1891.

The picture slightly changes when we also consider the existence of state-chartered institutions. Figure 5 shows that the gap between cities just right and left of the threshold decreases when we consider the sum of both state and national banks: cities just below 6,000 inhabitants have on average 2.2 banks, while cities just right of the threshold have average 1.9 banks. This result is intuitive, as state banks receive a comparative advantage when regulatory requirements for national banks increase. However, the overall net effect on total bank entry remains negative, consistent with the idea that national banks and state bank are not perfect substitutes.

[FIGURE 3 AND 4 AND 5 ABOUT HERE]

Overall, the visual evidence suggests that whenever national banking entrants face a higher capital requirement, entry of national banks is lower. At the same time, state chartered institutions partly fill the gap, but a difference in the number of banks operating in the local market remains.

In order to formally test the effect of capital regulation on the degree of competition in a local market, we estimate a Poisson model. We estimate a Poisson regression because the outcome variables, such as entry and number of banks, are discrete and non-binary. The exact specification is given by:

$$y_c = \exp\left(\alpha_s + \beta \mathbb{1}_c^{\text{pop1880}>6{,}000} + \gamma Z_c + \varepsilon_c\right), \tag{1}$$

where y_c is a measure of the number of bank entries between 1882 and 1891 in city c, and α_s is a set of state fixed effects to account for differences in the regulatory requirements of state-chartered banks. $\mathbb{1}_c^{\text{pop1880}>6{,}000}$ is as above, and Z_c is a set of city-level population and railroad-access controls: the logarithm of the city's population in 1880, the (absolute) growth in population between 1870 and 1880 as well as between 1880 and 1890. Moreover, we control for railroad access by controlling for the number of years since the city first had a railroad, as well as by using indicator variables that take the value one if the city had railroad access in 1881 and 1891, respectively.

We estimate the model for a set of different dependent variables, y_c. For each city c, we calculate the number of new entrants between 1882 and 1891, the net entries defined as the number of entries minus the number of exits between 1882 and 1891, and the absolute number of banks operating in 1891. We first estimate the model for national banks nb_{1891} and state banks sb_{1891} separately, and then for the sum of both national and state banks.

We start out by estimating Equation (1) for the exact sample used in Figures 3 to 5, i.e. for cities with exactly one bank in 1881. Results are reported in Table 4. In line with the visual patterns of Figure 3 and Figure 4, there is a positive and statistically significant correlation between population growth and the number of entries and net entries of national banks. However, after controlling for growth in population, Table 4 reveals also a statistically significant effect of being above the 6,000–person threshold on the number of entries and net entries between 1882 and 1891. In particular, towns with higher barriers to entry after 1881 have on average around 0.175 fewer national bank entrants than towns with a lower capital requirement, see columns (1) - (3), and around 0.21 less net national bank entries, see columns (4)-(6). The difference in coefficients can be explained by the fact that in 1883 and 1884 a large number of national bank charters that were originally granted for 20 years expired and in some cases this led to a re-chartering of some banks under new owners, which are counted as new entries.

[TABLE 4 ABOUT HERE]

To address the concern that the our threshold dummy $\mathbb{1}_c^{\text{pop1880}>6{,}000}$ might be picking up an unobserved larger trend, we consider a placebo test in which we move the threshold to 4,000 instead of 6,000,

and exclude all cities that had more than 4,000 inhabitants in 1870. Reassuringly, columns (7) and (8) show that the coefficient on the threshold dummy, while still negative, becomes much smaller and loses statistical significance.

We also estimate Equation (1) using the number of national banks, state banks, and total number of banks in 1891 as the dependent variable. Here, we distinguish between towns that have exactly one national bank in 1881 and those that have two. Columns (2) of Table 5 reveals that those towns that are subject to higher entry costs have a 35 percentage points lower chance of seeing a second national bank enter, a sizable effect given that the conditional chance of receiving an additional entry is around 20 percent. The effect is considerably weaker, but still present if we also include towns that have two national banks in 1881. Columns (1) shows that towns wither higher barriers of entries have 0.2 national banks less 10 years after the census was published. This is intuitive, as markets that have two national banks to begin with are arguably less attractive for a potential new, third entrant. This is turn reduces the unconditional probability of an additional entry.

As described above, since state banks are not subject to the same regulatory requirements as national banks, they might simply fill the gap left by national banks and thus leave the towns' competitive environment unchanged. To test this, in columns (3) and (4) of Table 5 we re-estimate Equation (1) using the total number of state banks as the dependent variable. We find that, indeed, cities that had one national bank in 1881 and higher entry costs after 1881 had, by 1891, 0.18 more state banks than those with lower entry costs—although the coefficient is not precisely estimated.

Finally, in columns (5) and (6) of the same table we add up both state and national banks, and find that crossing the threshold leads to an average of 0.17-0.19 fewer total banks, confirming the visual evidence of Figure 5. Altogether, our evidence hence suggests that being subject to higher barriers of entry predicts a lower actual probability of entry and is hence a good predictor for the degree of competition in a local market.

[TABLE 5 ABOUT HERE]

6 The effect of entry costs on incumbent banks' behavior

Having verified that capital regulation indeed predicts actual entry and hence competition, we now study the behavior of incumbent national banks. In particular, we contrast how incumbents behave

in markets with low and high barriers to entry, in the ten years following the publication of the 1880 census.

Focusing on incumbents—banks founded before the publication of the 1880 census—has the key advantage of isolating the effects of changes in the degree of local competition, as opposed to changes in the banks' capital structure. This is because, as discussed earlier, incumbent bank were grandfathered and the new minimum capital requirements only applied to newly founded banks. Hence, ncumbents were free to maintain their existing levels of capital and differential behavior across different markets arguably stems from differences in entry barriers.[15]

This section studies incumbents' behavior in three dimensions. First, we ask if higher barriers of entry affect their credit provision, and if other important balance sheet components are also affected. Second, we ask whether potential differences in credit provision can are driven by differences in actual entry, or whether they are a result of incumbents attempting to deter potential entry. Finally, we study the banks' risk appetite using various statistics on bank risk taking.

6.1 Credit provision

Figure 6 links the loan growth of incumbent national banks in 1882-1891 with the population in 1880 of the cities in which the banks are located. Eyeballing the difference around the 6,000 threshold, this figure suggests that incumbent banks in markets with higher entry barriers—at the right of the threshold—increased their loan portfolio by around 20 percentage points less than incumbent national banks in markets with lower entry barriers.

[FIGURE 6 ABOUT HERE]

To formally test this visual evidence, we estimate the following cross-sectional model:

$$y_b = \alpha_s + \beta \mathbb{1}_c^{\text{pop1880}>6{,}000} + \gamma X_b + \varepsilon_b, \tag{2}$$

where y_b, the outcome variable, is the growth rate of loans between 1881 and 1891, and $\mathbb{1}_c^{\text{pop1880}>6{,}000}$ is as defined above. Further, α_s is a set of state fixed effects, and X_b includes a battery of city and bank-level controls: number of national and state banks in 1881, population in 1880, population growth

[15] This is also seen empirically: Figure 13 in the Appendix shows that incumbent banks did not see a shift in their regulatory capital following the publication of the 1880 census.

between 1870 and 1880 as well as between 1880 and 1890, railroad access indicators for 1881 and 1891, years since first railroad access; as well as bank size in 1881, bank capital ratio in 1881, and the age of the bank as of 1881.

[TABLE 6 ABOUT HERE]

Table 6 reports the regression results through four alternative sets of controls, with column (1) containing the simplest specification and column (4)—our preferred specification—containing the full battery of controls. We verify our earlier visual results, with column (4) finding that crossing the threshold lead to a 22-20 percentage point lower loan growth in the ten years that followed the census publication. Hence, incumbent banks in markets with higher entry costs provided less credit than their peers in more competitive markets.

Moreover, we investigate whether the additional loan growth in markets with lower barriers to entry is financed by an expansion of the banks' balance sheet or a substitutions of liquid funds into illiquid loans. Moreover, to the extend it is driven by an expansion of the balance sheet, we can study whether additional loans are financed by raising additional equity or by expanding the deposit base. To understand this, we repeat eq. (2) with the 1881-1891 growth of equity, deposits, reserves, cash, bank notes, and total assets as our outcome variables.[16]

[TABLE 7 ABOUT HERE]

In line with the lower credit provision in markets with higher barriers to entry, Table 7 shows that these banks also have a 20 percentage points lower growth in deposits and an around 10 percentage points lower growth in overall assets.[17] There is no statistically significant difference in the growth of reserves, cash and bank notes, or equity. Hence, the additional credit provision in market with lower barriers to entry coincides with an expansion of the banks' deposit base rather than additional equity finance.

To address concerns that results might be driven by either unobservable local economic conditions impacting credit demand across the two types of markets, we can also exploit the full richness of our

[16]Bank equity is defined as the sum of paid-in capital (regulatory capital), surplus fund, and undivided dividends. Reserves are defined as the sum of cash and due from reserve agents. Cash is the sum of specie, fractional currency and coins, and legal-tender notes.

[17]Returning briefly to identification and bias, all else equal, one might have expected more lending opportunities and faster loan growth in towns that crossed the 6,000 inhabitant threshold. Any potential such bias goes against our results.

data and estimate a panel regression for all years between 1872 and 1891:[18]

$$y_{bt} = \alpha_{ct} + \beta \mathbb{1}_c^{\text{pop1880}>6{,}000} \times \text{Census-publication} + \gamma X_{bt} + \varepsilon_{bt}, \tag{3}$$

where y_{bt} is the annual growth rate of the bank-level variables described above, α_{ct} are county-time fixed effects, $\mathbb{1}_c^{\text{pop1880}>6{,}000}$ is as above and is interacted with a dummy variable that takes the value one after the publication of the census, and X_{bt} is a set of time-varying city and bank-level controls.

There are two particular advantages to this approach. First, it allows us control for the pre-trend across the two different types of banks. Second, it allows us to include county-time fixed effects α_{ct}, which absorb time-varying local economic conditions and allows us to compare cities that are geographically relatively close to each other.[19]

[TABLE 8 ABOUT HERE]

Table 8 columns (1), (3), and (5) show that banks in markets with higher entry barriers expanded their loan portfolio at a slower pace than their peers in untreated markets, with annual growth of each category falling behind by roughly 2.3 percentage points. At the same time, banks in markets with higher barriers to entry also issue less deposits and generally have smaller balance sheet growth: deposits increase at an around 1 percentage point lower and total assets at 1.3 percentage points lower rate after the census publication. Further, note that the results are also largely robust to including county-time fixed effects, which absorb local economic conditions and show that results are not driven by specific local conditions; see columns (2), (4), and (6).

All three findings are roughly in line with our estimates for the ten-year growth rates, where all three — deposits, loans, and total assets — grow at lower rates in less competitive markets. However, while we do find that deposits decrease in the cross-sectional as well as the panel analysis, the results are less clear cut and not statistically significant in the latter. We interpret this as evidence that banks' margin of adjustment to changes of barriers to entry is credit supply as opposed to deposit demand. This is in line with the notion that national banks exert relatively more market power on the asset side of their balance sheet than on liability side of the balance sheet. In particular, while savers can always

[18] We start our panel in 1872 as that is the year where the 1870 census was published.

[19] While our main specification in principle also allows for a county fixed effect, the relatively low number of observations impacts statistical power. Note that our cross-sectional regression are nonetheless robust to using county fixed effects. This is less a concern in a larger panel regression with many years of observations.

hold national bank notes that provide valuable liquidity services and safety, firms that desire credit for conducting their business may have little alternatives for getting external finance.

Naturally, it is also of interest to learn more about the mechanism giving rise to this differential behavior. In particular, it could be that incumbent banks expanded their lending only in those markets that experienced actual entry as banks competed over market share. Alternatively, the additional credit provision could also have resulted from incumbents being more expansive in their loan provision in an attempt to deter potential entrants, a possibility suggested by classic theories of firm competition (see, e.g., Dixit, 1979; Milgrom and Roberts, 1982a,b; Klemperer, 1987).

In order to shed light on this question, we estimate Equation (2) with a reduced sample consisting only of cities in which no additional bank, national or state, entered between 1881 and 1891. Only 235 of all cities considered in the main sample see an additional entrant between 1881 and 1891, leaving 454 cities in which national banks remain monopolists throughout 1891. Studying bank behavior in this restricted sample allows us to investigate whether barriers to entry determine bank behavior alone or whether barriers to entry determine bank behavior only through determining actual entry. In particular, observing differential behavior across market with different barrier to entry but only monopolistic banks can be takes as evidence that entry barrier alone determine bank behavior.

The result are shown in the Table 9. We find about the same effect if not a stronger effect on loan, deposit, and asset growth when we focus on this specific subset of cities, see Table 6. This indicates that there was a larger credit expansion by incumbent banks in market with lower barriers to entry even when there had not been no additional entry. We interpret this as evidence that is consistent with the idea that incumbent banks provide more credit and demand more deposits in order to prevent entry, i.e., to deter potential entrants.

[TABLE 9 ABOUT HERE]

Further information on the mechanism through which barriers of entry shaped bank outcomes can be attained by studying the timing of the effect in more detail. To this end we extend our previous panel data equation, by interacting the treatment indicator with with time dummies:

$$y_{bt} = \tau_t + \beta_t \times \tau_t \times \mathbb{1}_c^{\text{pop1880}>6{,}000} + \delta X_{bt} + \varepsilon_{bt}, \tag{4}$$

where y_{bt} is the loan growth of bank b from $t-1$ to t. Finally, we normalize coefficients to the year 1880,

the last date before the census publications become available.

Figure 7 show the coefficients across time for using annual loan growth as the dependent variable. The effect of entry barriers on loan growth appears right around the publication of the census. Given that actual entry takes much more time and happens only in some markets , Figure 7 provides further indication that the effect results from attempts to deter entry. Hence, credit expands slower in markets in which the threat of entry is lower.

Moreover, Figure 8 shows coefficient for estimating Equation (4) for using the change in deposits as the LHS variable. The picture that emerges is that deposits adjust much slower than credit. In line with the cross-sectional evidence above, deposit growth is lower in all but one years in markets with higher barriers to entry after the census is published. However, the differences between the two types of markets are less pronounced as for loans, reinforcing the idea that banks are better at exerting market power on the asset side than on the liability side.

[FIGURE 7 AND 8 ABOUT HERE]

Altogether, our evidence suggests that barriers to entry lead to a lower degree of credit provision. Moreover, the results are largely driven by changes in the barriers to entry. Therefore, our evidence complements existing, more recent evidence on pricing in the airline industry being driven by deterrence of entrants (see Goolsbee and Syverson, 2008). Hence, in the light of our evidence, the phenomena of entry deterrence appears to be prevalent across time as well as industries.

6.2 Risk taking

To study the effect of competition on risk taking and financial stability, we start by exploring two balance sheet ratios correlated to ex-ante risk taking: the equity-assets ratio, and the equity-loans ratio, selected because loans tend to be bank's riskiest asset component. Assuming equally risky loan portfolio's and cash holdings, larger equity buffers indicate that the bank was pursuing a more conservative investment strategy.

[FIGURE 9 AND 10 ABOUT HERE]

Figure 9 and Figure 10 suggest that incumbent banks in markets with higher entry barriers had more conservative business models. This is in line with the fact that the credit expansion in markets

with lower entry barriers was financed by issuing deposits rather than raising equity.

Estimating eq. (2) using the leverage and the capital ratio as dependent variables, Table 10 confirms these results when controlling for other observable characteristics. It shows that incumbent national banks in markets with lower barriers to entry had a lower leverage ratio in 1891, a higher capital ratio,[20] a lower ratio of loans to equity, and a higher ratio of cash to assets. In particular, incumbents in markets with high entry barriers had a 27 percentage point lower leverage ratio, and a 2 percentage points higher capital ratio. As mentioned above, these results are not driven by the regulatory capital requirement, as the 1881 change in regulation did not apply to incumbent banks.

[TABLE 10 ABOUT HERE]

Clearly, to conclude that more leveraged institutions are behaving in a riskier manner than less leveraged institutions, one would need to control for the risk profile of the loan portfolio, which is unobservable to us. Therefore, we also study alternative measures that can be seen as an ex-post measure of risk-taking. On the asset side, we measure ex-post asset quality through banks' holdings of seized real estate, referred to as "other real estate and mortgages owned" (OREO). Assuming that banks have similar collateral requirement across markets, higher holdings of these assets indicate that the bank had made riskier loans previously and had to seize collateral when the borrower defaulted. This ratio has a quite skewed distribution, so we focus on whether or not it is greater than zero.

On the liability side, we study differences in the use of bills payable and rediscounts. These funding instruments are indicative of risk taking as they tended to short-term, high interest rate, secured transactions to which banks turned when other sources of funding were scarce; we test whether banks in more competitive environments were more or less likely to use these particular liabilities.[21]

[TABLE 11 ABOUT HERE]

The results are in Table 11. With respect to OREO, column (1) shows that in 1891, a bank that had been operating in a less competitive market had a 10 percentage point lower probability of holding collateral, compared to untreated banks. Moreover, column (2) shows that this effect persists through

[20] The leverage ratio is defined as the difference between total assets and equity over equity. The capital ratio is defined as the ratio of equity over assets.

[21] Rediscounts and bills payable are a form of short-term, expensive, secured interbank funding. Banks typically used this form of funding to meet a surge in demand for funds, such as processing the autumn crop harvest; however, a number of studies have also found that this type of funding was used more extensively, and at higher cost, by banks that were experiencing difficulties White (1983); Calomiris and Mason (1997); Calomiris and Carlson (2018).

the Panic of 1893. Altogether, these results are consistent with the idea that banks with larger market power chose safer borrowers. We also find that banks in less competitive markets were less likely to make use of expensive funding via rediscounts and bills payable during the Panic of 1893, see column (4). However, the difference is not statistically significant.

Thus far, our results indicate that banks in areas with higher barriers to entry took less risk. These findings are consistent with the idea that banks in these areas had a higher charter value and that they acted in ways to preserve that value such as by making safer loans and being more cautious when making credit available. As a final test of risk-taking, we look at the experience of banks during and after the Panic of 1893. The Panic of 1893 was one of the most severe financial disturbances of the National Banking Era and has been attributed to, among other things, concerns about the US commitment to the gold standard and to concerns about the economy (Friedman and Schwartz, 1963; Carlson, 2013). Amid the panic, there were serious disruptions to the payment system and a significant number of bank closures, some permanently and some temporarily. This panic was followed by one of the most severe economic downturns in US history (Davis, 2004). Banks that had taken larger risks in the period preceding the Panic of 1893 would presumably be more exposed to borrower default and depositor flight during the panic and the downturn that followed.

Thus, whether the banks in the sample survived until 1898 or whether they failed or were voluntarily liquidated provides a further test of the riskiness of their business model. Banks that were judged by the examiners to be insolvent were placed in receiverships and are considered to have failed. Banks could alternatively decide to wrap up their business and voluntarily liquidate if they thought their prospects were not especially good or if they judged to be in trouble, but were still solvent. When a bank would get voluntarily liquidated, all debt-holders claims would be served in full and bank owner's would typically not be required to make good on their double liqability promise. I.e., the capital paid-in would be sufficient to make good on all promises to debt holders.

We calculate two dummy variables that indicate, respectively, whether a receiver was appointed between 1892 and 1898, or whether the bank decided to voluntarily liquidate between 1892 and 1898. In addition to capturing the impact of the economic downturn, this longer time period captures failures from the panic in the event that the time that the official liquidation commenced lagged the actual decision to liquidate by some years. Results are robust to considering a shorter time window. We then estimate Equation (2) as a probit model, now using the dummy variables on failure and liquidation as the dependent variable. Table 12 reports results on default and voluntary liquidations. We provide a

complete list of all banks that were placed under receivership or closed their door voluntarily in Table 14 and Table 15 in the Appendix.

[TABLE 12 ABOUT HERE]

The coefficients in the first line of columns (1), (2) and (3) indicate that there is a statistically significant difference in the probability of failure of incumbent banks across the different types of markets: More monopolistic incumbent banks have a 1 percentage point lower failure probability—which is considerable given an unconditional default probability of 2.1 percentage points.

We also find that banks in less competitive markets were less likely to voluntarily liquidate during and after the crisis. While the unconditional probability of a voluntarily liquidation is calculated as 2.8 percentage points, incumbent bank in less competitive market are estimated to have been 1.4 percentage points less likely to have given up their business during the crisis. These results also point to less risk-taking; it can be taken as an additional indication that charter values were higher in the less competitive markets, so that banks in these markets had a greater incentive to remain open, even in times of distress.

7 Evidence on manufacturing growth

After studying how competition affects credit availability and risk-taking, we now test whether competition at the bank level mattered for economic output. In doing so, we build on previous work looking at the role of national banks in fueling development in the National Banking Era, such as Jaremski (2014) and Fulford (2015).[22] Following Jaremski, we focus on the effects of credit provision by national banks on manufacturing outcomes as opposed to farming outcomes.

To study the real effects, we use data from the 1880 and 1890 decennial census, on capital establishments and output value in the manufacturing industry. This data is only available at the county level. Given that changes in county border over time make estimates of manufacturing growth potentially

[22]Jaremski (2014) uses institution level data on banks and county level data on manufacturing; identification in his setup comes from looking at a shock in the mid-1860s just as the country is returning to peace-time footing after the Civil War. By comparison, we are looking at a later period in which development is further along and less likely to be complicated by the end of the Civil War. Fulford (2015) looks at county-level bank data and manufacturing. He uses a similar identification strategy, but at a higher level of aggregation. Moreover, his paper focuses on the margin whether a town a receives a national bank or not rather than studying whether a town has a single or more national banks. Thus we view our analysis as a useful complement to this previous research, bolstering that work and integrating it with other analysis of how entry barriers affected competition, credit availability, and risk taking.

inaccurate, we instead construct estimates of manufacturing at the city-level. A meaningful link between county level and city-level data can be established if manufacturing outcomes are closely correlated with urban population. Under this assumption, one can calculate a population weighted city-level of manufacturing variables as follows:

$$y_{ct} = \frac{pop_{ct}}{\sum_{c=1}^{n} pop_{ct}} y_{county},$$

where y_c is the outcome variable of the census at the county level pop_{ct} is the population is population of location c at time t, and n is the number of cities in the county.[23]

At the city level, we then estimate the following equation:

$$y_c = \alpha + \beta \mathbb{1}_c^{\text{pop1880}>6{,}000} + \delta Z_c + \gamma_s + \varepsilon_c, \tag{5}$$

where y_c is again the harmonized growth from 1880 to 1890 in the value of products in manufacturing, the capital invested in manufacturing, and the number of manufacturing establishments, now at the city level. Z_c is a set of city-level controls such as the city's population, population growth, and railroad access.

We estimate Equation (5) using our city-level data between 1880 and 1890. Our results suggest that areas with lower entry barriers–which also tended to have banks where lending was growing more rapidly–tended to have more rapid growth in manufacturing. In particular, Table 13 indicates that cities with higher entry costs for national bank after 1881 experienced a lower growth in manufacturing capital as well as in manufacturing output. The growth in value of manufacturing output and capital invested between 1880 and 1890 is around 28 and 20 percentage points lower, respectively in areas with higher entry barriers for banks. These findings are largely in line with the evidence provided by Jaremski (2014) that suggests that areas more conducive to national bank entry tended to have faster manufacturing growth.

Moreover, the number of manufacturing establishments is estimated to be 10 percentage points lower. While the point estimates are not precise, the sign of the coefficient indicates that a decrease in the degree of competition in the banking sector also decreases the degree of competition in the non-financial

[23]Hornbeck (2010) provides a method to adjust county-level outcomes by using the change in the size of the county. Such an adjustment, while helpful when considering farming outcomes, may not necessarily be helpful when considering manufacturing outcomes. Note that our method of dis-aggregating results to the city level does not require us to account for changes in county borders.

sector. This is in line with existing evidence from Black and Strahan (2002) and Cetorelli and Strahan (2006).

[TABLE 13 ABOUT HERE]

These findings support the notion that financial outcomes matter for real economic outcomes (see, e.g., Peek and Rosengren, 2000; Chodorow-Reich, 2014; Benmelech et al., 2017). This is important, as it implies that the credit boom associated with the the reduction in competition does not only lead to a higher failure rate of banks during times of financial distress, but it also leads to a higher real economic growth beforehand. Therefore, our hints towards a trade-off between financial stability and a credit expansion that is associated with real economic growth.

8 Conclusion

How does competition in banking affect credit provision and financial stability? And how does it affect real economic outcomes? This paper tackles this set of important questions by providing evidence from the National Banking Era. Our empirical setting has two advantages over the existing empirical literature on the effect of banking competition. First, the peculiarities of the National Banking Era capital requirements allow us to identify the effect of competition on credit, financial stability, and real economic outcomes relatively cleanly. Second, studying bank behavior during the National Banking Era allows to study bank behavior in absence of government interventions such as bailouts and deposit insurance.

Our findings suggest that — in absence of government interventions such as bailouts and deposit insurance — banks provide more credit in market with lower barriers to entry. In particular, we find that banks seemingly do so to deter entry by potential competitors, and the behavior resembles behavior of non-financial firms in other markets (see, e.g., Goolsbee and Syverson, 2008). Further, we find evidence that more competitive environments may be areas of both greater credit availability that supports economic growth as well as areas of greater risk-taking that creates financial instability. We hence identify a tension between credit supply and financial stability, which is also debated in other recent work (Rancière et al., 2008; Schularick and Taylor, 2012; Rajan and Ramcharan, 2015; Mian et al., 2017; Jaremski and Wheelock, 2017). More research will be needed to more fully understand this trade-off.

Altogether, our evidence suggests that charter values play an important role in governing bank

behavior. Charter values may have been particularly important and influential in he particular period considered in this paper, as the National Banking Era can be seen as a light regulatory environment. Nevertheless, understanding the importance of charter values in determining bank behavior is also insightful and provides a sense of how financial institutions behave today in less regulated environments such as the less regulated shadow banking system. Hence, despite the historical nature of our study, the findings presented nonetheless have important implications for the understanding of contemporary banking. On the one hand, our findings imply that any policy that increases charter values is likely to increase financial stability, but potentially at the cost of reducing credit availability. On the other hand, as we identify the pure effects of banking competition — the forces that are at play in absence of government interventions — our results also provide a sense of how financial institutions behave in less regulated environments such as the less regulated shadow banking system.

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9 Figures

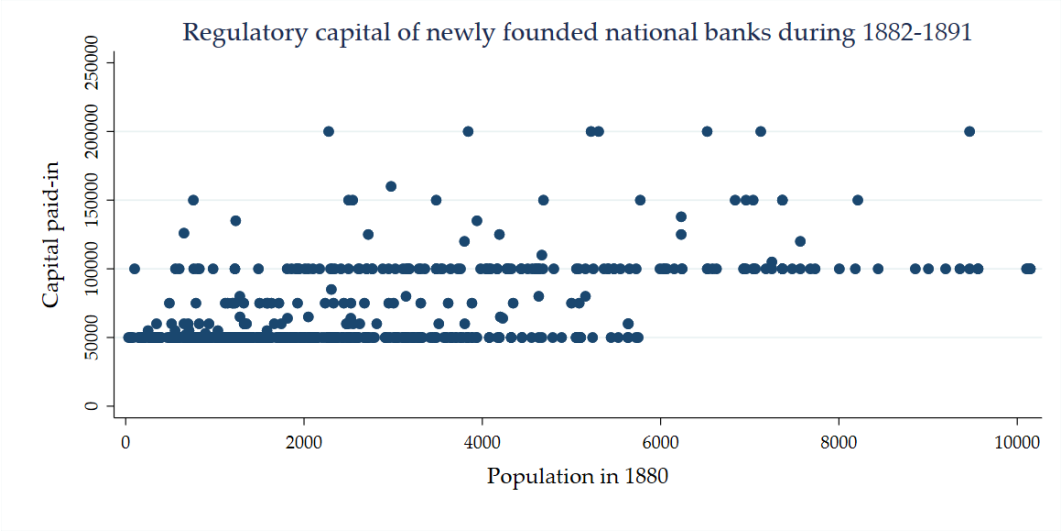


Figure 1: *Scatterplot of capital paid-in in the year after the founding year for all national banks founded between 1882 and 1891 by population of bank location.*

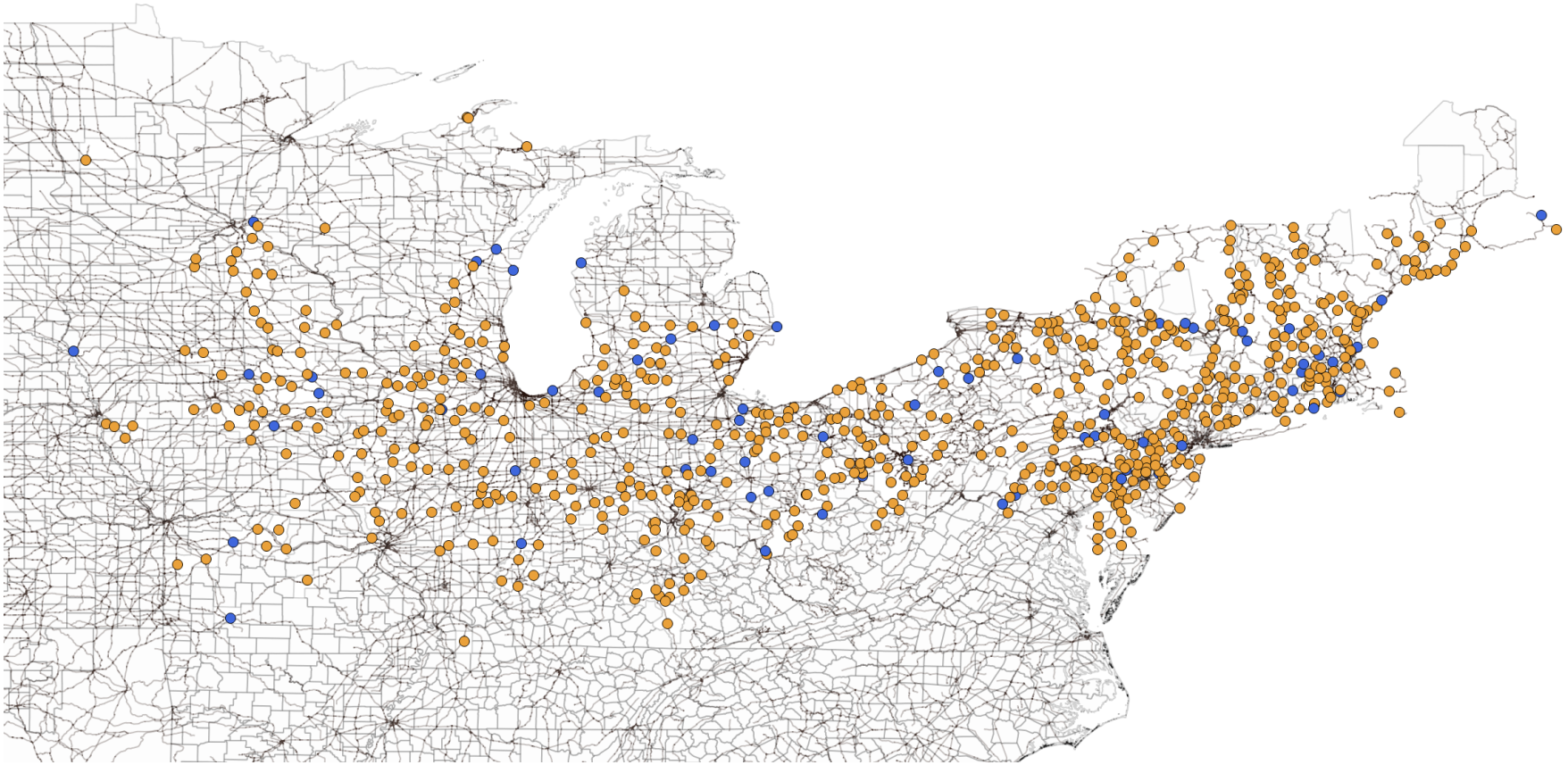


Figure 2: *Spatial distribution of cities with at least one bank in 1881 and less than 6,000 inhabitants prior to 1880. Cities are blue/non-transparent if* $\mathbb{1}_c^{pop>6,000} = 1$ *and orange/transparent if* $\mathbb{1}_c^{pop>6,000} = 0$*. County borders are from 1890 and railroads that are in operation by 1891.*

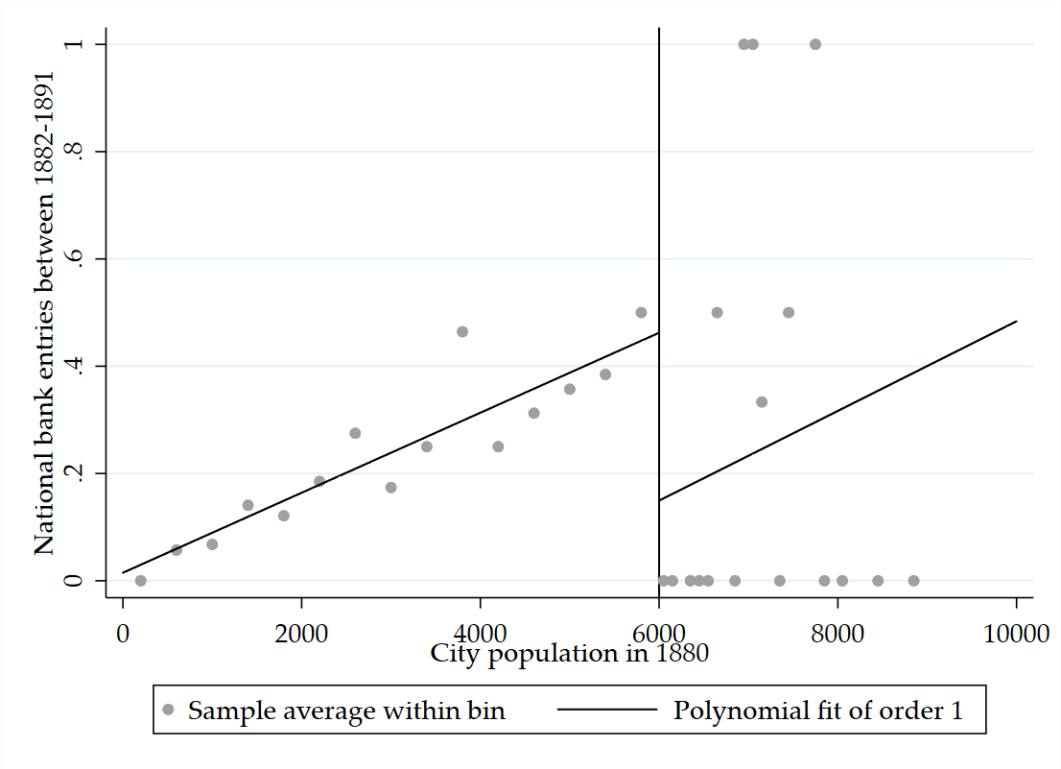


Figure 3: *Binned scatterplot of net entries of national banks between 1882 and 1891 by city population in 1880 in cities with exactly one bank in 1881. We generate the binned scatterplot using the "rdplot" command of the rdrobust package developed by Calonico et al. (2017).*

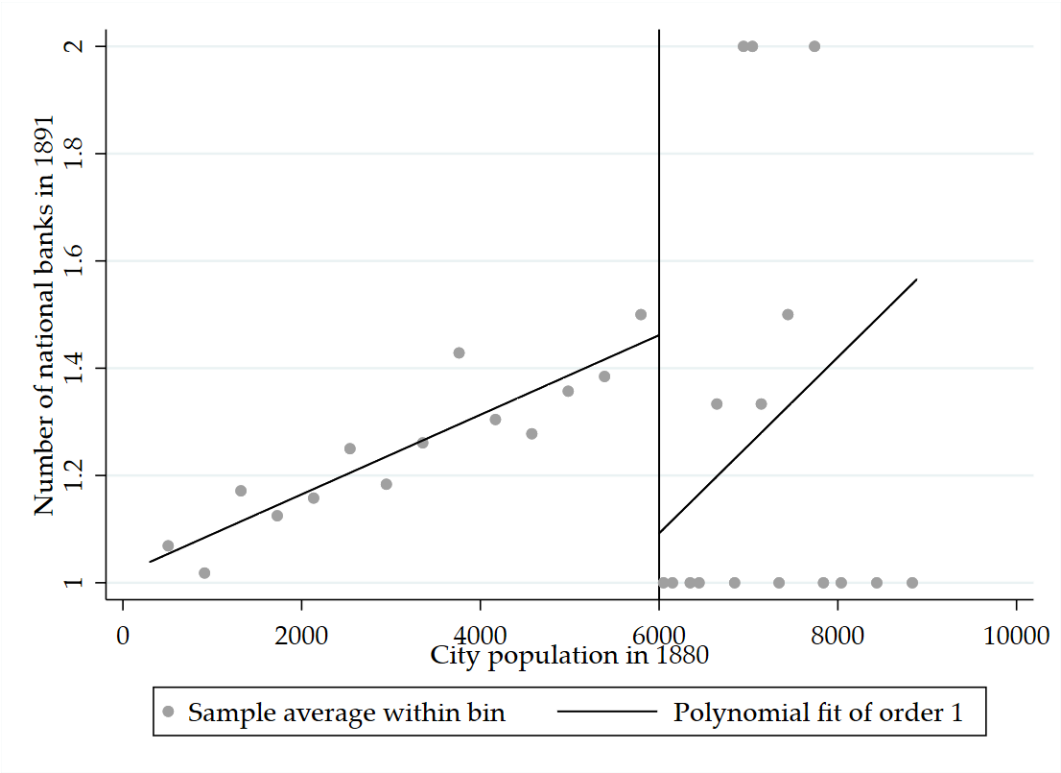


Figure 4: *Binned scatterplot of number of national banks in 1891 by city population in 1880 in cities with exactly one bank in 1881.*

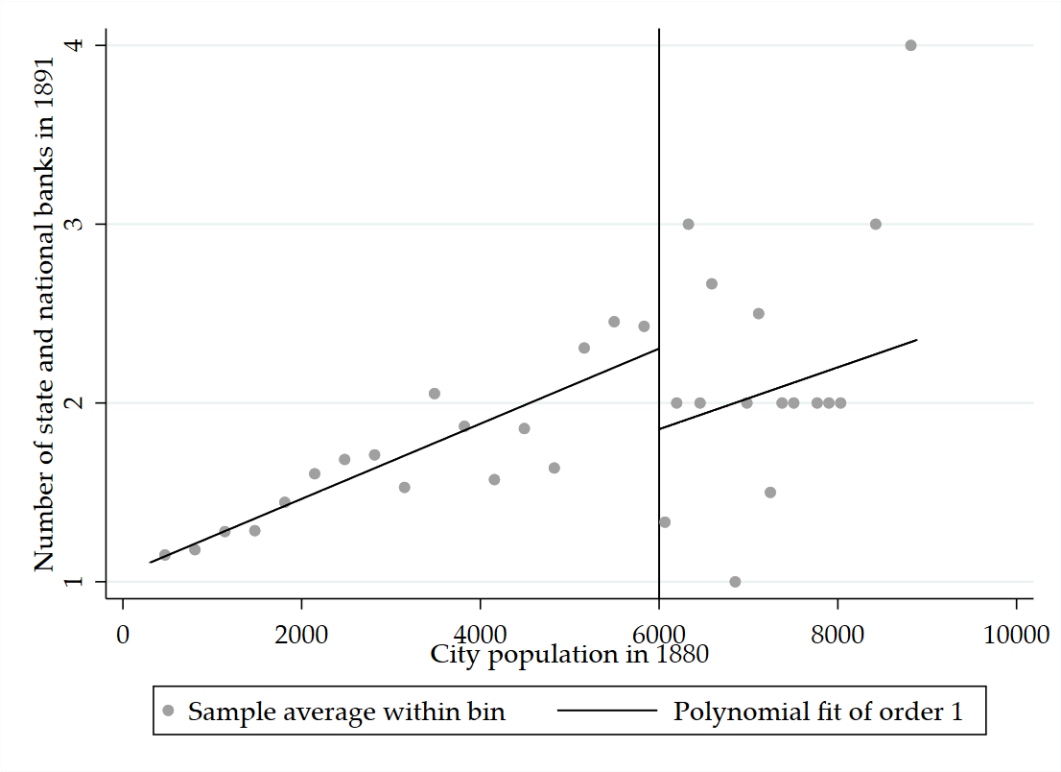


Figure 5: *Binscatter of number of national and state bank in 1891 by city population in 1880 in cities with exactly one bank in 1881.*

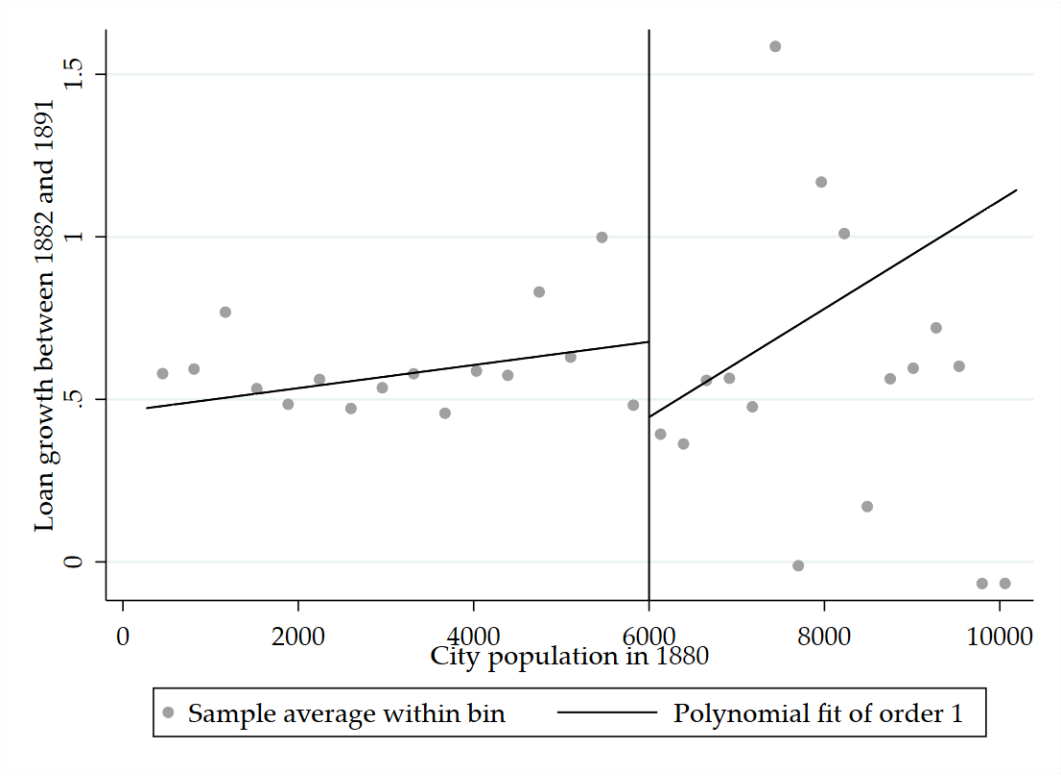


Figure 6: *Binned scatterplot of bank-level loan growth between 1882 and 1891 by city population in 1880.*

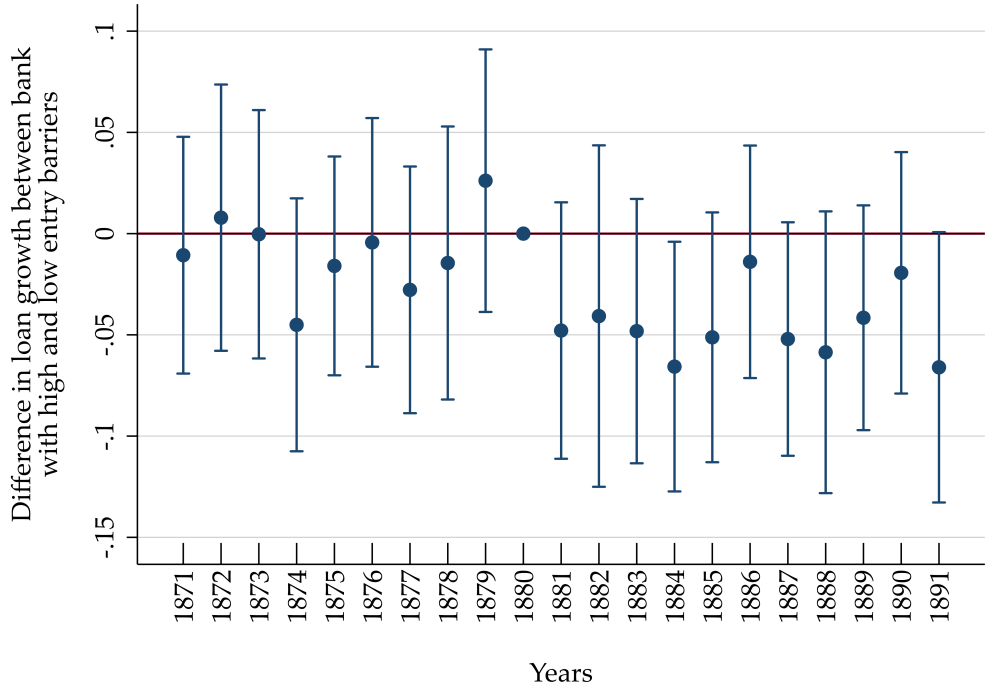


Figure 7: *The figure shows coefficient from estimating* $y_{bt} = \tau_t + \beta_t \times \tau_t \times \mathbb{1}_c^{pop1880>6{,}000} + \delta X_{bt} + \varepsilon_{bt}$ *where* y_{bt} *is the loan growth of bank b from* $t-1$ *to t. We normalize coefficients to 0 in the year prior to the census publication, 1880.*

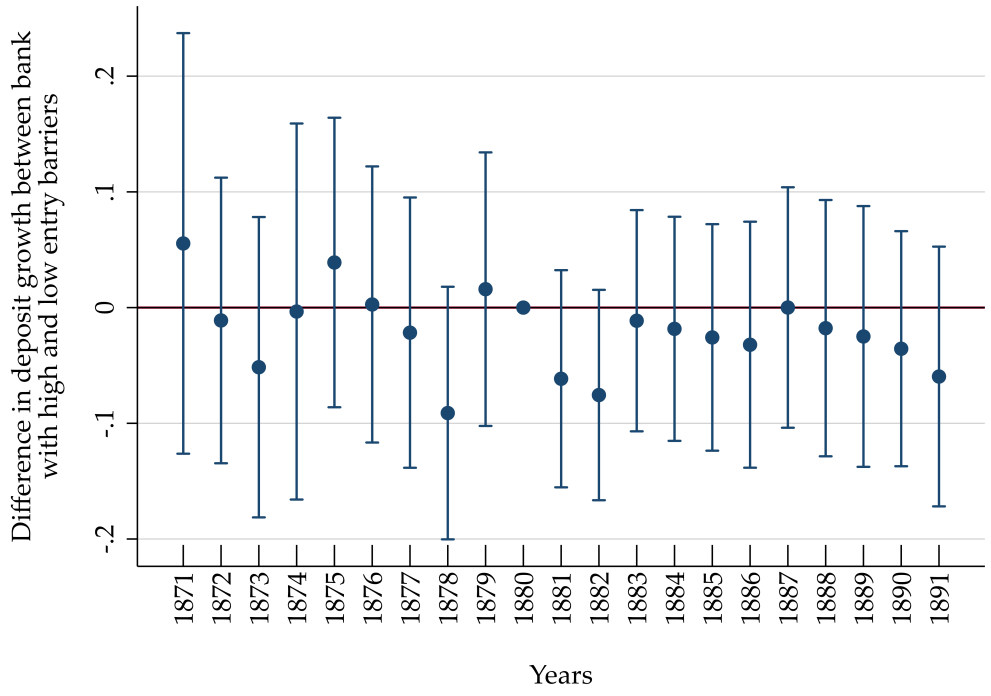


Figure 8: *The figure shows coefficient from estimating* $y_{bt} = \tau_t + \beta_t \times \tau_t \times \mathbb{1}_c^{pop1880>6{,}000} + \delta X_{bt} + \varepsilon_{bt}$ *where* y_{bt} *is the deposit growth of bank b from* $t-1$ *to* t*. We normalize coefficients to 0 in the year prior to the census publication, 1880.*

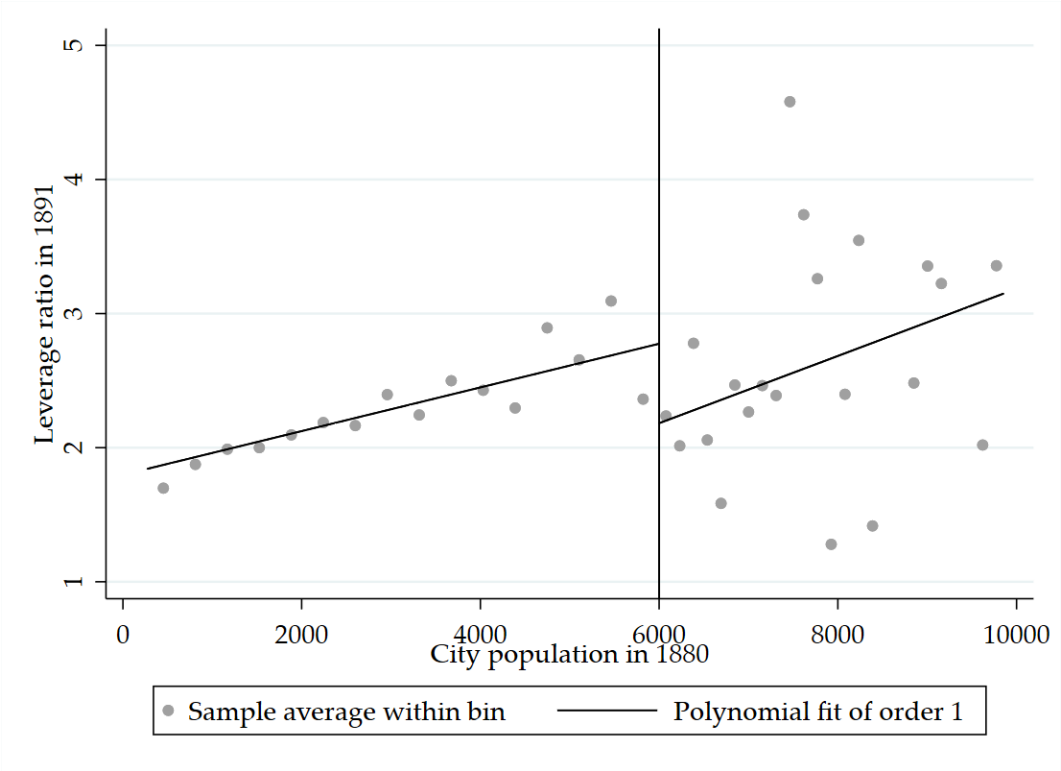


Figure 9: *Binned scatterplot of bank leverage in 1891 by city population in 1880.*

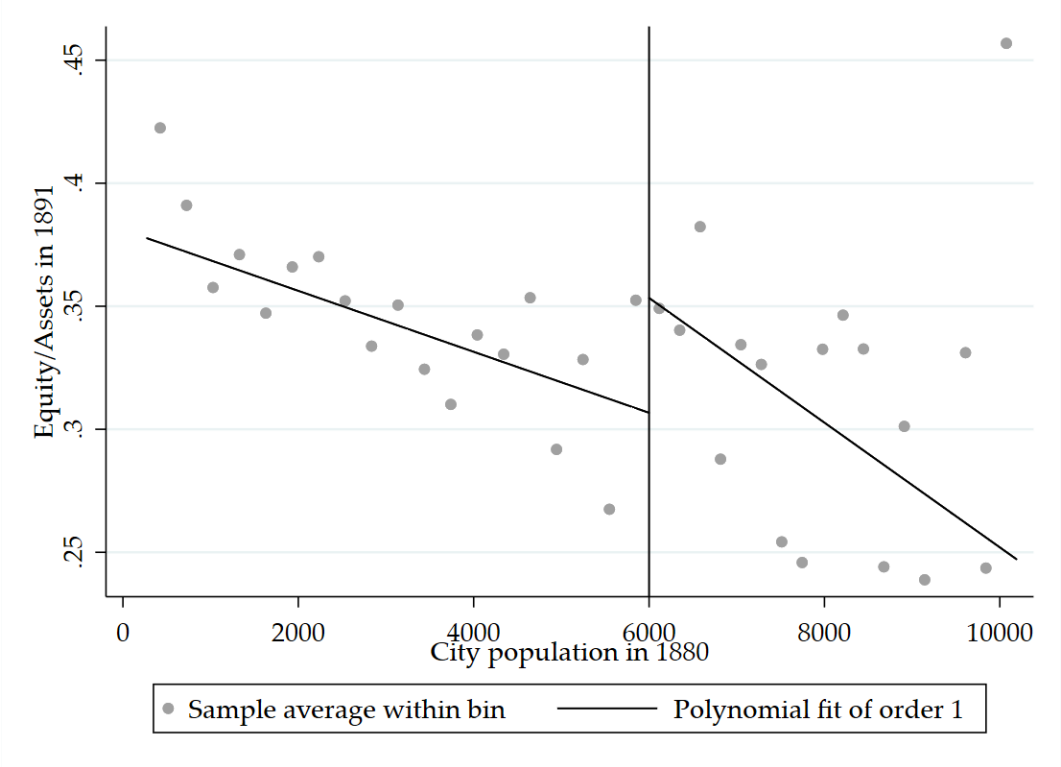


Figure 10: *Binned scatterplot of bank capital ratio in 1891 by city population in 1880.*

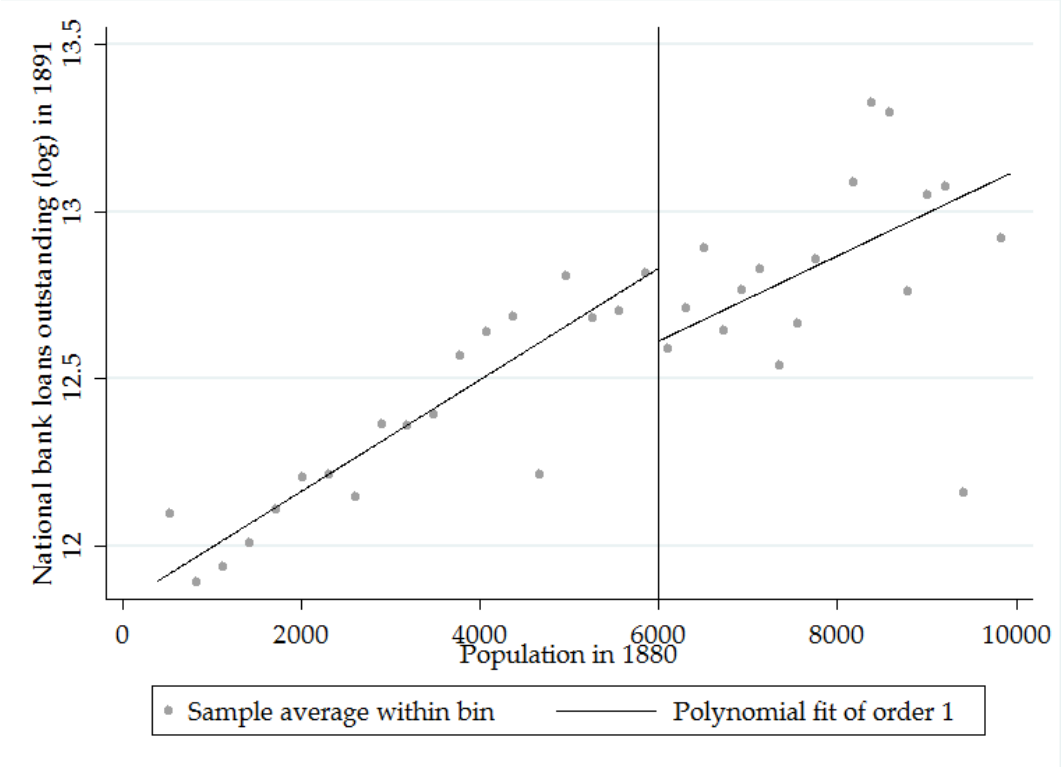


Figure 11: *Average amount of national bank loans outstanding (in log) by city population in 1880.*

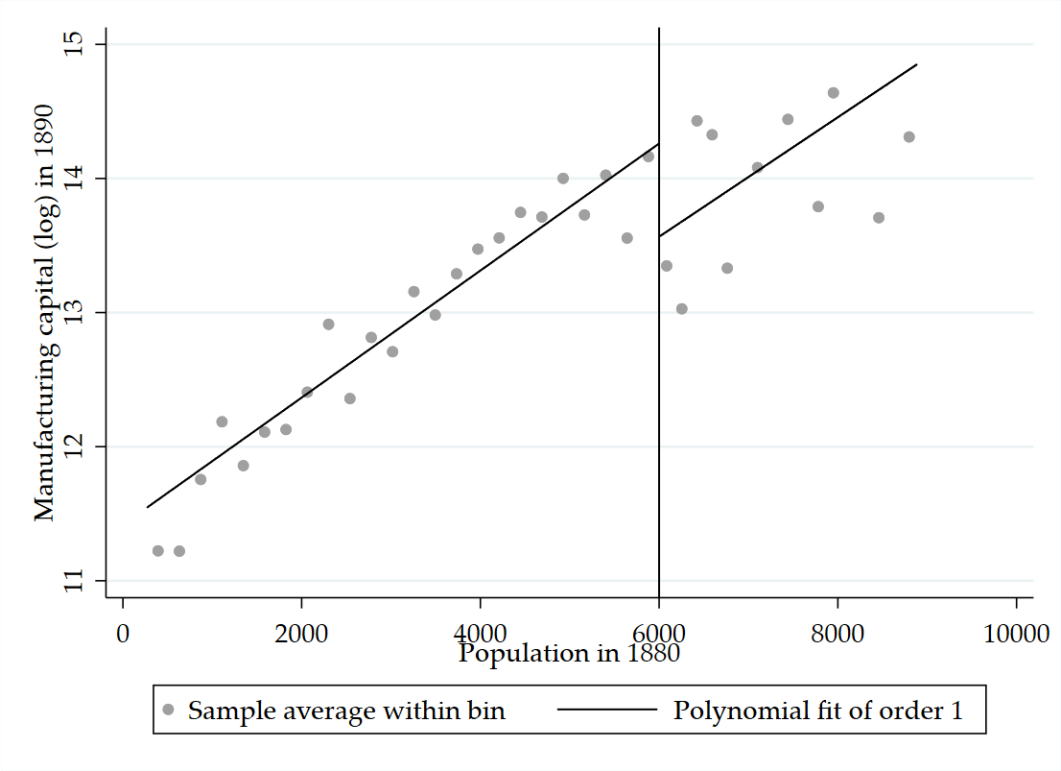


Figure 12: *Average manufacturing capital invested in 1890 by city population in 1880.*

10 Tables

Table 1: ***Descriptive statistics I***— *balance sheet characteristics in 1881 for national banks founded before 1881 and located in cities with less than 6,000 inhabitants in 1870 and one or two national banks in 1881.*

	Mean	Std	Min	10th Perc	25th Perc	Median	75th Perc	90th Perc	N
Total assets (in th)	399.51	216.70	66.08	187.35	251.92	342.00	489.80	681.12	813
Equity	126.19	76.24	31.00	56.16	66.17	116.63	147.15	230.47	813
Capital paid in	101.74	60.09	31.00	50.00	50.00	100.00	100.00	200.00	813
Surplus fund	23.89	22.82	0.00	2.80	10.00	20.00	30.00	50.00	813
Deposits	174.19	124.05	3.36	50.69	90.02	141.76	223.39	332.31	813
National bank notes	83.44	54.04	0.00	43.80	45.00	72.00	90.00	135.00	813
Cash (specie and legal tender)	19.69	16.69	0.28	4.27	8.53	15.57	26.08	37.49	813
Liquid assets	56.99	48.99	0.99	13.70	24.20	44.14	75.50	113.25	813
Loans and discounts	180.63	115.89	7.22	73.21	104.93	150.80	215.53	332.60	813
Debt/Assets	2.38	1.12	0.83	1.23	1.60	2.19	2.88	3.82	813
Capital/Assets	0.32	0.09	0.10	0.21	0.26	0.31	0.39	0.45	813
Loans/Assets	0.45	0.11	0.15	0.29	0.38	0.45	0.52	0.60	813
Deposits/Assets	0.42	0.16	0.07	0.20	0.32	0.43	0.54	0.62	813
Cash/Assets	0.05	0.03	0.00	0.02	0.03	0.04	0.07	0.09	813
Liquid/Assets	0.14	0.08	0.02	0.05	0.08	0.13	0.19	0.26	813
Reserves/(Required reserves)	2.46	1.46	0.20	1.04	1.45	2.12	3.10	4.25	813
Age	10.97	4.33	0.00	4.00	9.00	14.00	14.00	14.00	813
Population in 1870	2245.34	1623.02	0.00	0.00	1032.00	2008.00	3265.00	4693.00	813
Population in 1880	3176.69	2003.85	274.00	1038.00	1629.00	2709.00	4197.00	6031.00	813

Data restricted to banks with entirely correct balance sheet and charter in operation in 1881 and 1891.

Table 2: ***Descriptive statistics II***— *comparing characteristics of cities with less than 6,000 inhabitants in 1870, one or two national banks in 1881, but different entry barriers after the publication of the 1880 census.*

	Population 1880≤6000			Population 1880>6000			Difference	
	Mean	Std	N	Mean	Std	N	Diff	t-stat
Capital (in thousands) in 1881	116.453	82.489	641	186.808	122.215	59	70.355	4.361
Loans (in thousands) 1881	200.101	156.019	641	411.165	254.630	59	211.065	6.303
Total Assets (in thousands) in 1881	450.319	303.364	641	815.239	473.857	59	364.920	5.847
Population in 1860	1850.879	1090.237	406	3576.455	1282.450	44	1725.575	8.668
Population in 1870	2234.426	1214.891	552	5001.273	942.724	55	2766.847	20.290
Population in 1880	2580.905	1404.436	641	7386.881	1050.982	59	4805.977	32.748
Population in 1890	3222.119	2183.132	641	10667.407	5021.938	59	7445.288	11.369
Manufacturing establishments in 1880	39.016	27.447	640	93.859	42.009	58	54.843	9.824
Manufacturing capital per capita (in th) in 1880	0.115	0.087	640	0.128	0.079	58	0.013	1.200
Manufacturing output per capita in 1880	0.194	0.133	640	0.224	0.136	58	0.029	1.577
Share with railroad by 1871	0.811	0.392	641	0.915	0.281	59	0.104	2.635
Share with railroad by 1881	0.978	0.146	641	0.983	0.130	59	0.005	0.275
Share with railroad by 1891	0.995	0.068	641	1.000	0.000	59	0.005	1.734
Number of railroads by 1871	2.682	2.107	475	3.220	2.341	50	0.538	1.571
Number of railroads by 1881	5.256	3.067	641	7.051	4.010	59	1.795	3.372
Number of railroads by 1891	6.064	3.247	641	8.136	3.950	59	2.072	3.935
Years of railroad access in 1881	26.515	11.994	641	30.169	11.425	59	3.655	2.356
$\%\Delta_{harm}\text{Population}_{1870:1880}$	0.446	0.667	641	0.491	0.474	59	0.045	0.679
$\%\Delta\text{Population}_{1870:1880}$	0.279	0.489	552	0.540	0.471	55	0.261	3.930
$\%\Delta_{harm}\text{Capital}_{1871:1881}$	0.368	0.850	641	0.260	0.816	59	-0.108	-0.977
$\%\Delta_{harm}\text{Loans}_{1871:1881}$	0.493	0.844	641	0.455	0.774	59	-0.038	-0.358
$\%\Delta_{harm}\text{TotalAssets}_{1871:1881}$	0.567	0.765	641	0.472	0.722	59	-0.095	-0.965
$\%\Delta_{harm}\text{ManuCapital}_{1870:1880}$	0.418	0.709	640	0.532	0.505	58	0.114	1.589
$\%\Delta_{harm}\text{ManuEstablishments}_{1870:1880}$	0.195	0.762	640	0.262	0.585	58	0.067	0.815
$\%\Delta_{harm}\text{ManuOutput}_{1870:1880}$	0.331	0.735	640	0.428	0.612	58	0.097	1.144

Δy describes a standards growth rate, i.e., $\Delta y = (y_t - y_{t-1})/y_{t-1}$; Δ_{harm} describes a harmonized growth rate, i.e., $\Delta y = (y_t - y_{t-1})/(0.5 * (y_t + y_{t-1}))$. Capital, total assets, and loans are from national banks only.

Table 3: ***Descriptive statistics III***— *comparing sample national banks in 1881 across markets with different entry barriers after 1881.*

	Population 1880≤6000			Population 1880>6000			Difference	
	Mean	Std	*N*	Mean	Std	*N*	Diff	t-stat
Total assets (in th)	381.779	203.041	731	557.573	266.600	82	175.794	5.230
Equity	122.672	74.244	731	157.553	86.480	82	34.881	3.150
Capital paid in	98.789	58.228	731	128.009	69.714	82	29.220	3.180
Surplus fund	23.365	22.684	731	28.610	23.578	82	5.244	1.910
Deposits	163.288	114.060	731	271.424	162.398	82	108.136	5.243
National bank notes	81.522	51.958	731	100.506	67.923	82	18.984	2.120
Cash (specie and legal tender)	18.504	15.729	731	30.293	20.861	82	11.789	4.085
Liquid assets	54.145	46.873	731	82.376	59.453	82	28.232	3.866
Loans and discounts	169.527	106.089	731	279.643	148.880	82	110.117	5.844
Debt/Assets	2.339	1.106	731	2.745	1.166	82	0.406	2.648
Capital/Assets	0.327	0.091	731	0.291	0.081	82	-0.036	-3.306
Loans/Assets	0.440	0.112	731	0.500	0.122	82	0.060	3.729
Deposits/Assets	0.416	0.156	731	0.475	0.147	82	0.059	2.990
Cash/Assets	0.050	0.033	731	0.056	0.033	82	0.006	1.324
Liquid/Assets	0.141	0.082	731	0.148	0.078	82	0.007	0.740
Reserves/(Required reserves)	2.494	1.494	731	2.160	1.124	82	-0.334	-2.217
Age	10.989	4.288	731	10.780	4.709	82	-0.209	-0.376

Data restricted to banks with entirely correct balance sheet and charter in operation in 1881 and 1891

Table 4: ***Entry I***— *city-level evidence on entries of national banks between 1882 and 1891 in cities with exactly one national bank in 1881. Poisson estimation with average marginal effect reported.*

Dependent variable	Entries$_{nb}$, 1882-1891							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\mathbb{1}_{\text{pop1880}>6000}$	-0.172***	-0.165***	-0.162***	-0.210***	-0.222***	-0.213***		
	(0.044)	(0.046)	(0.046)	(0.038)	(0.038)	(0.039)		
$\mathbb{1}_{\text{pop1880}>4000}$							-0.058	-0.047
							(0.077)	(0.073)
Population in 1880 (log)	0.180***	0.196***	0.158***	0.231***	0.266***	0.240***	0.204***	0.167***
	(0.044)	(0.045)	(0.043)	(0.047)	(0.046)	(0.048)	(0.054)	(0.051)
Population growth, 1880-1890	0.003***	0.003***	0.003***	0.003***	0.002***	0.002***	0.003***	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Population growth, 1870-1880	0.003**	0.003**	0.003*	0.004**	0.003**	0.003*	0.001	0.001
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Years of railroad access		-0.006***	-0.005***		-0.002	-0.002	-0.006***	-0.004**
		(0.002)	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)
Railroad access by 1891		-0.224	-0.189		-0.417**	-0.321*	-0.198	-0.144
		(0.328)	(0.289)		(0.164)	(0.174)	(0.314)	(0.268)
Railroad access by 1881		0.048	-0.081		-0.164	-0.199	0.005	-0.135
		(0.151)	(0.152)		(0.142)	(0.142)	(0.142)	(0.135)
National bank capital in 1881			-0.232***			-0.109*		-0.240***
			(0.054)			(0.064)		(0.060)
National bank assets in 1881			0.300***			0.135*		0.299***
			(0.060)			(0.070)		(0.061)
Mean	.25	.25	.25	.25	.25	.25	.24	.24
R^2	.085	.1	.13	.19	.2	.2	.1	.13
Number of Cities	545	545	545	545	545	545	484	484
Number of Counties	352	352	352	352	352	352	319	319
State FE	No	No	No	Yes	Yes	Yes	No	No

This tables shows coefficients from estimating

$$y_c = \exp\left(\alpha_s + \beta \mathbb{1}_c^{\text{pop1880}>6{,}000} + \gamma Z_c + \varepsilon_c\right),$$

where y_c is the number of national banks entering the market of city c between 1882 and 1891. We estimate the equation with Poisson and report average marginal effects. The sample is reduced to cities with less than 4,000 inhabitants according to the 1870 census in columns (7) and (8). Data is restricted to cities with exactly one national bank in 1881.
Robust standard errors in parentheses and stars indicate significance at the 10%, 5%, and 1% level, respectively.

Table 5: ***Entry II***— *city-level evidence on existence of national banks and state bank in 1891 by number of national banks in 1881. Poisson estimation and average marginal effects reported.*

nb_{1881}	$\in \{1,2\}$	=1	$\in \{1,2\}$	=1	$\in \{1,2\}$	=1
Dependent variable	nb_{1891}		sb_{1891}		$sb_{1891} + nb_{1891}$	
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{1}_{\text{pop1880}>6000}$	-0.194***	-0.351***	0.082	0.180	-0.174**	-0.190**
	(0.072)	(0.064)	(0.083)	(0.115)	(0.073)	(0.087)
Population in 1880 (log)	0.120***	0.122***	0.258***	0.133**	0.323***	0.198***
	(0.033)	(0.028)	(0.057)	(0.058)	(0.039)	(0.038)
Population growth, 1880-1890	0.006***	0.006***	0.003***	0.003**	0.002	0.008***
	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
Population growth, 1870-1880	0.004**	0.006***	-0.004**	-0.000	0.001	0.004*
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Years of railroad access	-0.003	-0.003	-0.002	-0.003	-0.003	-0.004*
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Railroad access by 1891	-0.083	0.075	0.247	-0.169	0.141	-0.070
	(0.303)	(0.261)	(0.277)	(0.221)	(0.210)	(0.237)
Railroad access by 1881	0.009	-0.199	-0.026	0.360*	-0.135	0.096
	(0.190)	(0.150)	(0.169)	(0.192)	(0.162)	(0.174)
National bank capital in 1881	-0.078	-0.155**	-0.106	0.002	-0.205**	-0.224**
	(0.068)	(0.064)	(0.107)	(0.127)	(0.081)	(0.088)
National bank assets in 1881	0.350***	0.219***	-0.003	0.094	0.340***	0.349***
	(0.067)	(0.062)	(0.109)	(0.134)	(0.081)	(0.090)
$nb_{1881} + sb_{1881}$	0.196***	0.025	0.248***	0.331***	0.429***	0.485***
	(0.031)	(0.046)	(0.035)	(0.059)	(0.036)	(0.056)
Mean	1.4	1.2	.44	.38	1.7	1.6
R^2	.052	.02	.28	.26	.062	.051
Number of Cities	700	545	700	545	700	545
Number of Counties	425	352	425	352	425	352
State FE	Yes	Yes	Yes	Yes	Yes	Yes

This tables shows coefficients from estimating

$$y_c = \exp\left(\alpha_s + \beta \mathbb{1}_c^{\text{pop1880}>6{,}000} + \gamma Z_c + \varepsilon_c\right),$$

where y_c is city c's number of national banks in 1891 nb_{91}, or the sum of national banks and state banks in 1891, $nb_{91} + sb_{91}$. We estimate the the equation with Poisson and report margins. All estimations are restricted to cities with at least one national bank in 1881. Moreover, column (2) and (4) restrict the sample to cities with one or two national banks in 1881 and column (3) and (6) restrict the sample to cities with exactly one national bank in 1881.

Robust standard errors in parentheses and stars indicate significance at the 10%, 5%, and 1% level, respectively.

Table 6: ***Bank credit I (cross-section)*** **—** *bank-level evidence on growth of bank loans between 1881 and 1891 for incumbent national banks (founded before 1882).*

Dependent variable	$\%\Delta_{\text{Loans}}$			
	(1)	(2)	(3)	(4)
$1_{\text{pop1880}>6000}$	-0.224**	-0.212***	-0.213**	-0.198**
	(0.105)	(0.071)	(0.108)	(0.075)
Population in 1880 (log)	-0.053	-0.052	-0.111*	-0.057
	(0.062)	(0.066)	(0.065)	(0.062)
Population growth, 1870-1880	0.017	0.014	0.009	-0.056***
	(0.024)	(0.022)	(0.025)	(0.018)
Population growth, 1880-1890	0.108***	0.108***	0.098***	0.085***
	(0.019)	(0.015)	(0.019)	(0.013)
$nb_{81} + sb_{81}$	-0.097*	-0.102	-0.110**	-0.129*
	(0.055)	(0.070)	(0.055)	(0.064)
Years of railroad access		-0.002	-0.002	0.001
		(0.003)	(0.003)	(0.003)
Railroad access by 1891		-0.318	-0.202	-0.562**
		(0.210)	(0.221)	(0.210)
Railroad access by 1881		0.354*	0.316	0.366*
		(0.197)	(0.210)	(0.178)
Total assets in 1881 (log)			0.201***	0.412***
			(0.068)	(0.093)
Capital/Assets in 1881				0.738**
				(0.351)
Age				-0.071***
				(0.011)
Mean	.58	.58	.58	.58
R^2	.16	.16	.17	.29
No of Banks	813	813	813	813
No of Cities	689	689	689	689
No of Counties	421	421	421	421
State FE	Yes	Yes	Yes	Yes

This table shows coefficients from estimating:

$$y_b = \alpha_s + \beta 1_c^{\text{pop1880}>6{,}000} + \gamma X_b + \varepsilon_b,$$

where y_b is bank b's change in loans and discounts between 1881 to 1891. The sample is restricted to national banks that had been founded by 1881.
Standard errors clustered at the bank level in parentheses and stars indicate significance at the 10%, 5%, and 1% level, respectively.

Table 7: ***Bank credit II (cross-section)*** *—bank-level evidence on growth of equity, deposits, reserves and liquid assets, and total bank assets between 1881 and 1891 for incumbent national banks (founded before 1882).*

Dependent variable	$\%\Delta_{\text{Equity}}$	$\%\Delta_{\text{Deposits}}$	$\%\Delta_{\text{Reserves}}$	$\%\Delta_{\text{Cash}}$	$\%\Delta_{\text{Notes}}$	$\%\Delta_{\text{Total}}$
	(1)	(2)	(3)	(4)	(5)	(6)
$1_{\text{pop1880}>6000}$	-0.029	-0.201**	0.124	0.089	0.011	-0.096*
	(0.053)	(0.090)	(0.181)	(0.187)	(0.042)	(0.051)
Population in 1880 (log)	-0.062***	0.045	0.072	0.093	-0.036	-0.012
	(0.021)	(0.052)	(0.092)	(0.100)	(0.022)	(0.034)
Population growth, 1870-1880	0.020*	-0.013	-0.029	-0.027	0.005	-0.003
	(0.012)	(0.021)	(0.035)	(0.037)	(0.011)	(0.013)
Population growth, 1880-1890	0.033***	0.056***	0.045	0.045	0.012*	0.042***
	(0.009)	(0.015)	(0.036)	(0.036)	(0.007)	(0.012)
Years of railroad access	0.002	0.000	-0.001	-0.000	-0.002	0.000
	(0.001)	(0.002)	(0.004)	(0.004)	(0.001)	(0.001)
Railroad access by 1891	0.163	0.072	0.635	0.822	0.067	-0.063
	(0.123)	(0.276)	(0.525)	(0.585)	(0.144)	(0.148)
Railroad access by 1881	-0.084	-0.089	-0.382	-0.515	-0.009	-0.001
	(0.067)	(0.260)	(0.493)	(0.557)	(0.082)	(0.122)
Total assets in 1881 (log)	0.181***	0.456***	0.526***	0.562***	0.124***	0.344***
	(0.034)	(0.066)	(0.116)	(0.119)	(0.029)	(0.053)
Capital/Assets in 1881	-0.929***	3.735***	3.706***	4.026***	0.149	0.588***
	(0.154)	(0.442)	(0.724)	(0.784)	(0.165)	(0.192)
Age	-0.029***	-0.063***	-0.060***	-0.065***	-0.006**	-0.037***
	(0.003)	(0.007)	(0.011)	(0.012)	(0.003)	(0.003)
$nb_{81} + sb_{81}$	-0.005	-0.160***	-0.192**	-0.205**	-0.028	-0.064**
	(0.024)	(0.054)	(0.092)	(0.100)	(0.024)	(0.029)
Mean	.14	.43	.46	.52	-.54	.098
R^2	.39	.31	.18	.18	.091	.43
No of Banks	813	813	813	813	812	813
No of Cities	689	689	689	689	688	689
No of Counties	421	421	421	421	420	421
State FE	Yes	Yes	Yes	Yes	Yes	Yes

This table shows coefficients from estimating:

$$y_b = \alpha_s + \beta \mathbb{1}_c^{\text{pop1880}>6{,}000} + \gamma X_b + \varepsilon_b,$$

where y_b is bank b's change in equity, deposits, reserves, liquid assets, national bank notes, and total assets between 1881 to 1891. The sample is restricted to national banks that had been founded by 1881.
Standard errors clustered at the bank level in parentheses and stars indicate significance at the 10%, 5%, and 1% level, respectively.

Table 8: ***Bank credit III (panel)*** *— bank-year-level evidence on behavior of incumbent national banks (founded before 1882) from 1871 to 1891.*

Dependent variable	$\%\Delta_{\text{Loans}}$		$\%\Delta_{\text{Deposits}}$		$\%\Delta_{\text{Total}}$	
	(1)	(2)	(3)	(4)	(5)	(6)
$1_{\text{pop1880}>6000} \times$ Census	-0.023**	-0.027*	-0.010	-0.039*	-0.013**	-0.026**
	(0.009)	(0.015)	(0.012)	(0.021)	(0.006)	(0.010)
Total Assets (log)	-0.047**	-0.129***	-0.068***	-0.143***	0.031**	-0.001
	(0.019)	(0.023)	(0.020)	(0.039)	(0.013)	(0.018)
Total capital (log)	0.074***	0.114***	0.153***	0.190***	0.055***	0.072***
	(0.020)	(0.025)	(0.022)	(0.041)	(0.014)	(0.019)
Equity/Assets	-0.802***	-0.937***	-0.864***	-1.150***	-0.473***	-0.569***
	(0.060)	(0.074)	(0.070)	(0.126)	(0.043)	(0.056)
Loans/Assets	0.515***	0.563***	-0.068**	0.007	-0.065***	-0.034
	(0.025)	(0.033)	(0.030)	(0.049)	(0.017)	(0.022)
Liquid Assets/Assets	-0.379***	-0.418***	0.677***	0.705***	0.229***	0.200***
	(0.042)	(0.047)	(0.046)	(0.086)	(0.026)	(0.035)
Deposits/Assets	0.124***	0.141***	0.573***	0.615***	0.111***	0.105***
	(0.034)	(0.044)	(0.043)	(0.078)	(0.024)	(0.032)
Railroad Dummy	-0.026*	-0.012	-0.008	-0.040	-0.016	-0.007
	(0.014)	(0.036)	(0.020)	(0.064)	(0.011)	(0.021)
Mean	.051	.047	.089	.085	.027	.023
R^2	.28	.6	.28	.6	.31	.64
N	15354	10458	15354	10657	15354	10657
No of Banks	812	584	812	584	812	584
No of Cities	689	461	689	461	689	461
No of Counties	421	196	421	196	421	196
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	No	Yes	No	Yes	No
County-time FE	No	Yes	No	Yes	No	Yes

This table reports coefficients from estimating

$$y_{bt} = \alpha_{ct} + \beta \mathbb{1}_c^{\text{pop1880}>6{,}000} \times \text{Census} + \gamma X_{bt} + \varepsilon_{bt},$$

where y_{bt} is either the annual change in loans, deposits, or total assets. Census is a dummy that takes the value one in 1882, i.e., after the census of 1880 is published. γ_{ct} is a county-time fixed effect. We estimate the equation using data from 1872 to 1891.
Standard errors clustered at the bank level in parentheses and stars indicate significance at the 10%, 5%, and 1% level, respectively.

Table 9: ***Threat of entry***— *bank-level evidence on growth of loans between 1881 and 1891 for incumbent national banks (founded before 1882) for banks in towns that do not see a new bank enter.*

Dependent variable	$\%\Delta_{\text{Loans}}$	$\%\Delta_{\text{Deposits}}$	$\%\Delta_{\text{Total}}$
	(1)	(2)	(3)
$1_{\text{pop1880}>6000}$	-0.248**	-0.347**	-0.125*
	(0.103)	(0.155)	(0.072)
Population in 1880 (log)	-0.046	0.084	0.009
	(0.063)	(0.063)	(0.024)
Population growth, 1870-1880	0.017	0.032	-0.009
	(0.038)	(0.047)	(0.021)
Population growth, 1880-1890	0.070	0.108*	0.046**
	(0.041)	(0.059)	(0.021)
Years of railroad access	-0.001	-0.001	-0.001
	(0.005)	(0.003)	(0.002)
Railroad access by 1891	-0.463	-0.093	-0.324***
	(0.288)	(0.287)	(0.102)
Railroad access by 1881	0.317	0.074	0.102
	(0.265)	(0.267)	(0.095)
Total assets in 1881 (log)	0.352***	0.420***	0.317***
	(0.092)	(0.103)	(0.049)
Age	-0.089***	-0.078***	-0.041***
	(0.015)	(0.010)	(0.005)
$nb_{81} + sb_{81}$	0.278	0.316	0.164
	(0.212)	(0.215)	(0.103)
Mean	.57	.47	.072
R^2	.3	.35	.41
No of Banks	454	454	454
No of Cities	454	454	454
No of Counties	291	291	291
State FE	Yes	Yes	Yes

This table shows coefficients from estimating:

$$y_b = \alpha_s + \beta \mathbb{1}_c^{\text{pop1880}>6{,}000} + \gamma X_b + \varepsilon_b,$$

where y_b can either bank b's change in loans, deposits, or and total assets between 1881 to 1891, or bank b's leverage, capital ratio or loan ratio in 1891. The sample is restricted to national banks that had been founded by 1881 and are located in cities that do not see any additional national bank entering between 1881 and 1891.
Standard errors clustered at the bank level in parentheses and stars indicate significance at the 10%, 5%, and 1% level, respectively.

Table 10: ***Bank risk taking I—*** *bank-level evidence on bank balance sheet characteristics in 1891 for incumbent national banks (founded before 1882).*

Dependent variable	$\frac{\text{Debt}}{\text{Equity}}$	$\frac{\text{Equity}}{\text{Assets}}$	$\frac{\text{Loans}}{\text{Equity}}$	$\frac{\text{Deposits}}{\text{Assets}}$	$\frac{\text{Cash}}{\text{Assets}}$	$\frac{\text{Reserves}}{\text{Required Reserves}}$
	(1)	(2)	(3)	(4)	(5)	(6)
$1_{\text{pop1880}>6000}$	-0.363***	0.027***	-0.566***	-0.033***	0.007*	0.100
	(0.132)	(0.010)	(0.147)	(0.012)	(0.004)	(0.134)
Population in 1880 (log)	0.101	-0.010	0.037	0.023***	0.008***	0.021
	(0.062)	(0.006)	(0.072)	(0.007)	(0.002)	(0.112)
Population growth, 1870-1880	0.066**	-0.007***	0.066*	0.010***	-0.002**	-0.049
	(0.033)	(0.002)	(0.039)	(0.003)	(0.001)	(0.036)
Population growth, 1880-1890	-0.006	0.001	0.032	-0.003	-0.000	0.008
	(0.021)	(0.002)	(0.036)	(0.003)	(0.000)	(0.013)
Years of railroad access	-0.007**	0.001***	-0.004	-0.001***	-0.000	-0.003
	(0.003)	(0.000)	(0.004)	(0.000)	(0.000)	(0.006)
Railroad access by 1891	-0.423	0.076**	-0.616*	-0.119***	-0.008	1.317*
	(0.449)	(0.036)	(0.370)	(0.041)	(0.009)	(0.772)
Railroad access by 1881	0.402	-0.034	0.353	0.003	-0.006	-0.566
	(0.289)	(0.025)	(0.249)	(0.032)	(0.008)	(0.730)
Total assets in 1881 (log)	0.630***	-0.043***	0.845***	0.037***	-0.009***	-0.357***
	(0.080)	(0.007)	(0.102)	(0.009)	(0.002)	(0.129)
Age	-0.020**	0.002***	-0.027***	-0.003***	0.000**	0.023**
	(0.008)	(0.001)	(0.010)	(0.001)	(0.000)	(0.010)
$nb_{81} + sb_{81}$	-0.245***	0.014**	-0.060	-0.023***	-0.000	-0.059
	(0.072)	(0.006)	(0.087)	(0.008)	(0.002)	(0.097)
Mean	2.3	.35	2.7	.5	.054	2.2
R^2	.57	.64	.5	.66	.25	.17
No of Banks	813	813	813	813	813	813
No of Cities	689	689	689	689	689	689
No of Counties	421	421	421	421	421	421
State FE	Yes	Yes	Yes	Yes	Yes	Yes

This table shows coefficients from estimating:

$$y_b = \alpha_s + \beta \mathbb{1}_c^{\text{pop1880}>6{,}000} + \gamma X_b + \varepsilon_b,$$

where y_b is bank b's debt over equity, capital ratio, deposit ratio, loans over equity, or reserves over required reserves in 1891. The sample is restricted to national banks that had been founded by 1881.
Standard errors clustered at the bank level in parentheses and stars indicate significance at the 10%, 5%, and 1% level, respectively.

Table 11: ***Bank risk taking II—*** *bank-level evidence on risk taking: OREO and Rediscounts. Probit estimation and average marginal effect reported.*

Dependent variable	OREO		Rediscounts	
	1891	1892-1896	1891	1892-1896
	(1)	(2)	(3)	(4)
main				
$1_{\text{pop1880}>6000}$ (d)	-0.102**	-0.131*	0.033	-0.052
	(0.050)	(0.073)	(0.031)	(0.044)
Population in 1890 (log)	-0.065**	-0.086**	0.004	0.014
	(0.031)	(0.037)	(0.014)	(0.027)
Population growth, 1880-1890	0.005	0.006	0.001	0.017**
	(0.008)	(0.010)	(0.003)	(0.007)
Population growth, 1870-1880	0.024**	0.040***	0.001	0.014
	(0.012)	(0.015)	(0.005)	(0.010)
Years of railroad access	-0.003**	-0.002	-0.001*	-0.002
	(0.001)	(0.002)	(0.001)	(0.001)
Total Assets (log) in 1891	0.086**	0.188***	0.021	-0.042
	(0.039)	(0.046)	(0.016)	(0.034)
Capital/Assets in 1891	-0.034	-0.084	0.142**	-0.113
	(0.148)	(0.183)	(0.057)	(0.134)
Loans/Assets in 1891	-0.085	0.476***	0.306***	0.797***
	(0.120)	(0.150)	(0.065)	(0.130)
Age	0.005	0.000	-0.002	-0.005
	(0.004)	(0.005)	(0.002)	(0.003)
Mean	0.241	0.556	0.556	0.400
R^2	.025	.051	.13	.097
No of Banks	808	808	808	808
No of Cities	684	684	684	684
State FE	No	No	No	No

This table shows coefficients from estimating:

$$y_b = \alpha_s + \beta \mathbb{1}_c^{\text{pop1880}>6{,}000} + \gamma X_b + \varepsilon_b,$$

where y_b is a dummy variable that takes the value one if bank b has hold more than \$2,500 of "other real estate and mortgages owned" (OREO) or is using rediscounts or bills payable as a source of funding in either 1891 or anytime throughout 1892-1896. OREO typically is seized collateral from defaulting borrowers. Rediscounts and bill payable are a very expensive source of funding, often used in times of distress. The sample is restricted to national banks that had been founded by 1881. We estimate the equation by using a probit model and report margins.
Robust standard errors in parentheses and stars indicate significance at the 10%, 5%, and 1% level, respectively.

Table 12: ***Bank risk taking III—*** *bank-level evidence on bank defaults and voluntary liquidations. Probit estimation and average marginal effect reported.*

Dependent variable	Receiver Appointed		Voluntary Liquidation	
	(1)	(2)	(3)	(4)
main				
$1_{\text{pop1880}>6000}$ (d)	-0.011*	-0.010*	-0.015	-0.014**
	(0.007)	(0.006)	(0.013)	(0.006)
Population in 1890 (log)	0.007	0.011*	-0.007	0.005
	(0.006)	(0.006)	(0.007)	(0.005)
Population growth, 1880-1890	0.003***	0.003***	0.003*	0.003***
	(0.001)	(0.001)	(0.002)	(0.001)
Population growth, 1870-1880	0.003	0.002	-0.007	0.000
	(0.003)	(0.003)	(0.007)	(0.004)
Years of railroad access	-0.000	-0.000	-0.001	-0.001*
	(0.000)	(0.000)	(0.000)	(0.000)
Total Assets (log) in 1891		-0.014		-0.039***
		(0.009)		(0.010)
Capital/Assets in 1891		-0.031		0.024
		(0.032)		(0.033)
Loans/Assets in 1891		0.007		0.031
		(0.030)		(0.029)
Age		-0.001		0.002**
		(0.001)		(0.001)
Mean(depvar)	0.021	0.021	0.028	0.028
R^2	.12	.15	.028	.15
No of Banks	808	808	808	808
No of Cities	684	684	684	684
State FE	No	No	No	No

This table shows coefficients from estimating:

$$y_b = \alpha_s + \beta \mathbb{1}_c^{\text{pop1880}>6{,}000} + \gamma X_b + \varepsilon_b,$$

where y_b is a dummy variable that takes the value one only if bank b default between 1893 and 1896, or voluntarily liquidates between 1893 and 1896. The sample is restricted to national banks that had been founded by 1881. We estimate the equation by using a probit model and report margins. Robust standard errors in parentheses and stars indicate significance at the 10%, 5%, and 1% level, respectively.

Table 13: ***Real economic outcomes*** *— city-level evidence on growth of value of manufactured products, capital invested in manufacturing and manufacturing establishments, between 1880 and 1890.*

Dependent variable	$\%\Delta_{\text{Capital}}$		$\%\Delta_{\text{Value}}$		$\%\Delta_{\text{Establishments}}$	
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{1}_{\text{pop1880}>6000}$	-0.282**	-0.281**	-0.196**	-0.196**	-0.080	-0.099
	(0.125)	(0.124)	(0.089)	(0.090)	(0.097)	(0.095)
Population in 1880 (log)	0.087	0.099	0.088	0.088	0.077*	0.075*
	(0.074)	(0.076)	(0.054)	(0.056)	(0.042)	(0.045)
Population growth, 1880-1890	0.007**	0.007**	0.001	0.001	-0.000	0.001
	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Population growth, 1870-1880	0.022***	0.022***	0.016***	0.016***	0.012***	0.012***
	(0.006)	(0.006)	(0.004)	(0.004)	(0.003)	(0.003)
Years of railroad access		-0.009**		-0.006**		0.002
		(0.004)		(0.003)		(0.002)
Railroad access by 1891		0.778**		0.300		0.335
		(0.372)		(0.235)		(0.204)
Railroad access by 1881		0.217		0.419**		-0.025
		(0.275)		(0.194)		(0.164)
Number of Banks in 1881		-0.046		-0.014		-0.042
		(0.078)		(0.059)		(0.050)
Mean	.86	.86	.42	.42	.066	.066
R^2	.31	.32	.31	.33	.28	.29
Number of Cities	699	699	699	699	699	699
Number of Counties	427	427	427	427	427	427
State FE	Yes	Yes	Yes	Yes	Yes	Yes

Data on manufacturing growth is only available at the county level. We dis-aggregate to the city level by urban population. In particular, we calculate for each city c in a given *county*:

$$y_{ct} = \frac{pop_{ct}}{\sum_{c=1}^{n} pop_{ct}} y_{county},$$

The table then reports coefficients from estimating:

$$y_c = \alpha + \beta \mathbb{1}_c^{\text{pop1880}>6{,}000} + \delta Z_c + \gamma_s + \varepsilon_c.$$

where y_c is city c's growth of manufacturing capital, manufacturing output, or manufacturing establishments between 1880 and 1890.
Standard errors clustered at the city level in parentheses and stars indicate significance at the 10%, 5%, and 1% level, respectively.

A Important National Banking Laws

Act of June 3, 1864 (The National Bank Act). Section 7. No association shall be organized under this act, with a less capital than one hundred thousand dollars, nor in a city whose population exceeds fifty thousand persons, with a less capital than two hundred thousand dollars: Provided, that banks with a capital of not less than fifty thousand dollars may, with the approval of the Secretary of the Treasury, be organized in any place the population of which does not exceed six thousand inhabitants.

B Supplementary Figures and Tables

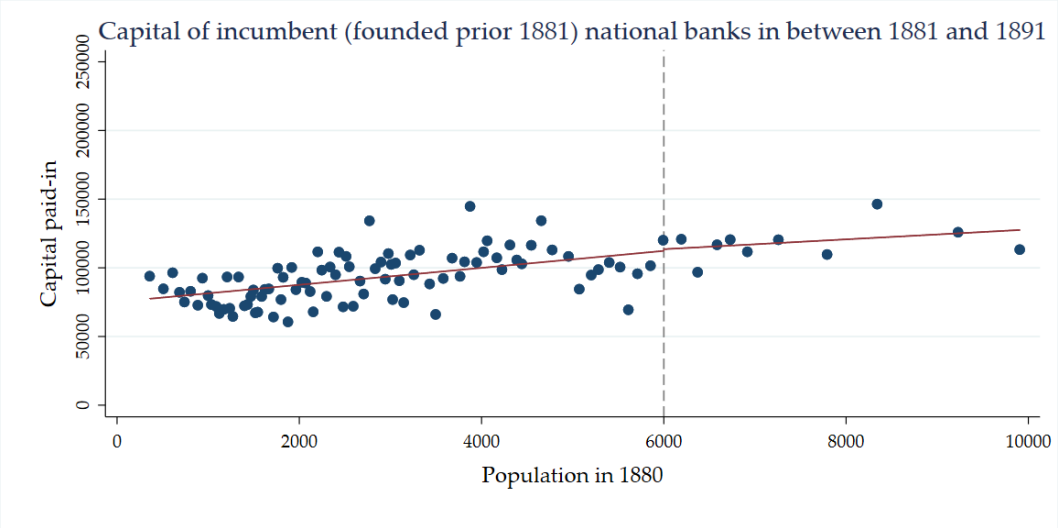


Figure 13: *Scatterplot of capital paid-in for all for banks that were founded prior to 1882 between 1881 and 1891, by population of bank location.*

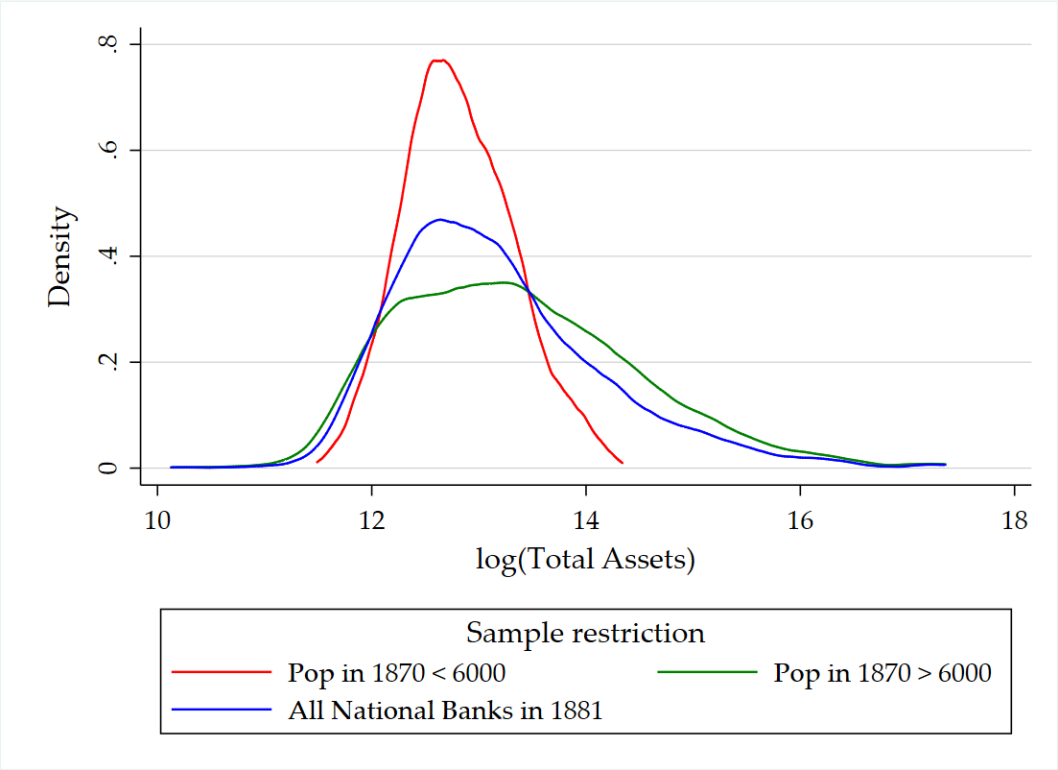


Figure 14: *This figures plots the size distribution of all national bank in existence in 1881 and by sub-sample, depending on whether the data is used in our main analysis.*

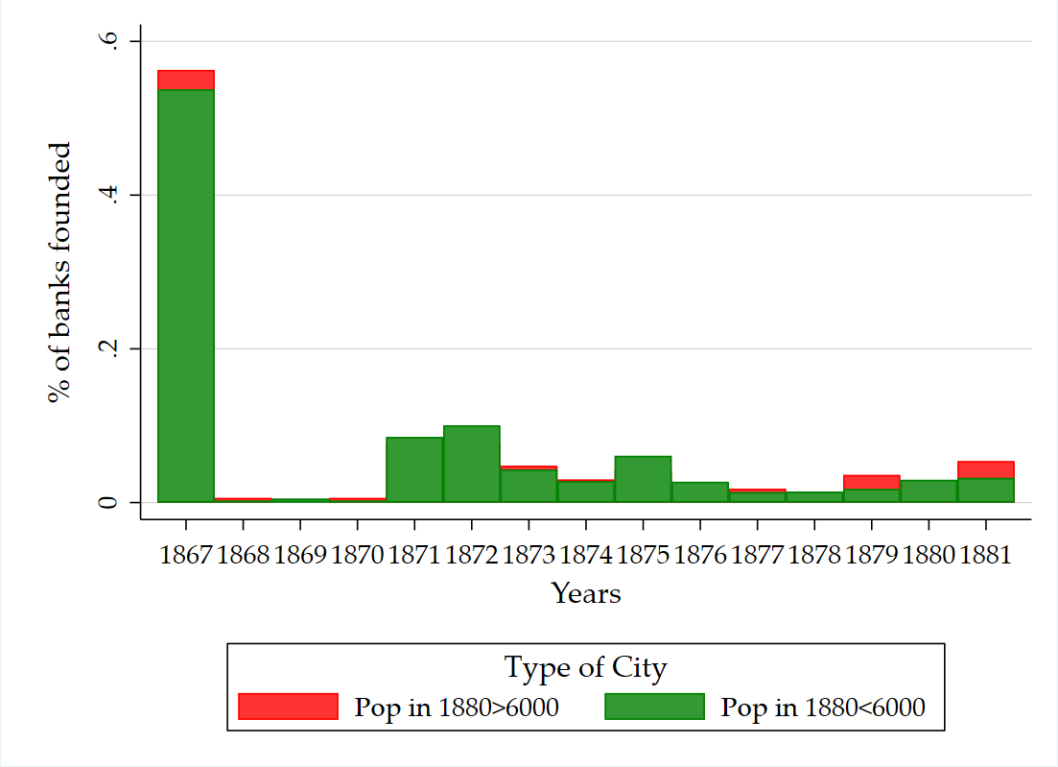


Figure 15: *This figures plots shows the fraction of national banks founded in the years leading up to the 1880 census.*

Table 14: *List of Banks with a receiver appointed during 1891 and 1898*

Bank Name	City	State	Year Receiver Appointed
Population in 1880<6000			
FIRST NATIONAL BANK	Kankakee	Illinois	1893
CITIZENS NATIONAL BANK	Muncie	Indiana	1893
FIRST NATIONAL BANK	Cedar Falls	Iowa	1893
NORTHERN NATIONAL BANK	Big Rapids	Michigan	1893
NATIONAL GRANITE STATE BANK	Exeter	New Hampshire	1893
NATIONAL BANK OF MIDDLETOWN	Middletown	Pennsylvania	1894
FIRST NATIONAL BANK	Pella	Iowa	1895
FIRST NATIONAL BANK	Decorah	Iowa	1896
YATES COUNTY NATIONAL BANK	Penn Yan	New York	1896
NATIONAL BANK OF POTSDAM	Potsdam (village)	New York	1897
FIRST NATIONAL BANK	Franklin	Ohio	1897
FIRST NATIONAL BANK	Carthage	New York	1898
FIRST NATIONAL BANK	Lisbon	Ohio	1898
Population in 1880>6000			
FIRST NATIONAL BANK	Sedalia	Missouri	1894
FIRST NATIONAL BANK	Willimantic	Connecticut	1895
SIOUX NATIONAL BANK	Sioux City	Iowa	1896
FIRST NATIONAL BANK	Sioux City	Iowa	1897

The table shows all defaults between 1891 and 1898 of banks that are located in cities that had one or two national banks in 1881 and less than 6,000 inhabitants according to the census of 1870.

Table 15: *List of Banks with that are voluntarily liquidated during 1891 and 1898*

Bank Name	City	State	Year of Liquidation
Population in 1880<6000			
FIRST NATIONAL BANK	Jerseyville	Illinois	1894
FIRST NATIONAL BANK	Mason City	Illinois	1898
FIRST NATIONAL BANK	Greensburg	Indiana	1897
FIRST NATIONAL BANK	Kendallville	Indiana	1894
FIRST NATIONAL BANK	Nashua	Iowa	1894
NATIONAL BANK OF WINTHROP	Winthrop	Maine	1897
ORONO NATIONAL BANK	Orono	Maine	1893
FIRST NATIONAL BANK	Constantine	Michigan	1894
FIRST NATIONAL BANK	Centreville	Michigan	1893
FIRST NATIONAL BANK	Romeo	Michigan	1897
FIRST NATIONAL BANK	Ionia	Michigan	1897
PONTIAC NATIONAL BANK	Pontiac	Michigan	1898
FARMERS NATIONAL BANK	Constantine	Michigan	1893
FIRST NATIONAL BANK	Clinton	Missouri	1894
BATES COUNTY NATIONAL BANK	Butler	Missouri	1894
LAKE NATIONAL BANK	Wolfeboro	New Hampshire	1893
FIRST NATIONAL BANK	Andes	New York	1896
NATIONAL BANK OF FAYETTEVILLE	Fayetteville	New York	1894
FIRST NATIONAL BANK	Bath (village)	New York	1898
FARMERS AND DROVERS NATIONAL BANK	Somers	New York	1896
FIRST NATIONAL BANK	Athens	Pennsylvania	1897
FIRST NATIONAL BANK	Waynesboro	Pennsylvania	1895
Population in 1880>6000			
FIRST NATIONAL BANK	Springfield	Missouri	1893
NATIONAL BANK OF SIOUX CITY	SIOUXCITY	Iowa 1893	
CORN EXCHANGE NATIONAL BANK	SIOUXCITY	Iowa 1894	
MERCHANTS NATIONAL BANK	BATTLECREEK	Michigan 1894	

The table shows all voluntary liquidations between 1891 and 1898 of banks that are located in cities that had one or two national banks in 1881 and less than 6,000 inhabitants according to the census of 1870.

C Historical Documents

PENNSYLVANIA.

First National Bank, Mifflintown.

JEREMIAH LYONS, *President.* No. 4039. EZRA C. DOTY, *Cashier.*

Resources.		Liabilities.	
Loans and discounts	$172,227.74	Capital stock paid in	$50,000.00
Overdrafts	107.91		
U. S. bonds to secure circulation	50,000.00	Surplus fund	6,000.00
U. S. bonds to secure deposits		Undivided profits	2,038.62
U. S. bonds on hand			
Stocks, securities, etc		National-bank notes outstanding	45,000.00
Due from approved reserve agents	27,187.99	State-bank notes outstanding	
Due from other national banks	1,059.41		
Due from State banks and bankers	886.19	Dividends unpaid	
Bank'g house, furniture, and fixtures	9,400.00		
Other real estate and mortg's owned		Individual deposits	173,934.15
Current expenses and taxes paid	811.99	United States deposits	
Premiums on U. S. bonds	6,400.00	Deposits of U.S. disbursing officers	
Checks and other cash items	508.41		
Exchanges for clearing house		Due to other national banks	8,826.66
Bills of other national banks	1,015.00	Due to State banks and bankers	
Fractional currency, nickels, cents	140.04		
Specie	8,721.75	Notes and bills rediscounted	
Legal-tender notes	5,083.00	Bills payable	
U. S. certificates of deposit			
Redemption fund with Treas. U. S.	2,250.00		
Due from Treasurer U. S.			
Total	285,799.43	Total	285,799.43

Figure 16: *Excerpt from the 1891 OCC annual report.*

THE ORGANIZATION OF SMALL BANKS.

A bill was introduced in the Senate in February by Mr. Ingalls, of Kansas, which proposed to allow National Banks to be organized with a capital as small as $50,000 in any place, regardless of its population. In reporting adversely upon this bill, the Finance Committee of the Senate cite the following letter from the Comptroller of the Currency:

TREASURY DEPARTMENT,
OFFICE OF COMPTROLLER OF THE CURRENCY,
WASHINGTON, February 24, 1876.

SIR: I have the honor to acknowledge the receipt of your letter of the 1st instant, transmitting, for my views, Senate bill No. 75, which provides that section 5138, Revised Statutes United States, be so amended as to read as follows: "No association shall be organized under this title with a less capital than $50,000." The section referred to, which it is proposed to amend, provides that banks with a capital of not less than $50,000 may, with the approval of the Secretary of the Treasury, be organized in any place the population of which does not exceed 6,000 inhabitants; and that no association shall be organized in a city the population of which exceeds 50,000, with a less capital than $200,000. The Act of February 25, 1863, which was superseded by the National Bank Act of June 3, 1864, provided that "the capital stock of National Banks shall not be less than $50,000, and in cities whose population is over 10,000, the capital stock shall not be less than $100,000."

The object of the proposed amendment would seem to be to authorize the organization of banks in cities and villages containing a greater population than 6,000 inhabitants, which are now supposed to be excluded from these privileges of the National Bank Act, namely, those authorizing the organization of banks with as small a capital as $50,000 in places the population of which does not exceed 6,000. I find from the census returns of 1870 that the State of Ohio had at that time 20 cities and villages exceeding 6,000 inhabitants, and that Indiana had 12, Illinois 18, Michigan 10, Wisconsin 7, Iowa 8, Missouri 4, Minnesota 3, Kansas 3 and Nebraska 2. In all of these cities, with the single exception of Newburg, a suburb of Cleveland, there are at the present time National Banking Associations, having in each instance a capital exceeding $100,000. In most of these cities and villages two or more National Banks exist under the provisions of the present act. It follows, therefore, that National Banks may be organized in all the cities and villages of the Western States with the exception of those enumerated with a capital of $50,000, and it will be found upon an examination of the last annual report of this office that many banks having a capital of $100,000 and upward have been organized in villages having a population of much less than 6,000. Experience has shown that in almost every instance where two or more banks have been organized in small towns, with a capital of $50,000, they have been so organized for the purpose of providing positions for stockholders or friends of stockholders of the several organizations, and in numerous instances, after such organizations have been perfected, applications have been made to this office for the consolidation of two or more of them into one with a large capital, in order to save expenses; and it rarely happens that applications are made for the organization of banks of a less capital than $100,000 in any of the larger towns of the country. The organization of numerous small institutions in the large cities has a tendency to weaken those already organized, and to so divide the business as to make them all more or less unprofitable to the shareholders. Very few applications are on file in this office for the organization of banks, which cannot be organized under the existing law.

I am of the opinion, therefore, that the passage of Mr. Ingalls' proposed amendment would be injurious rather than beneficial to the National Banking system.

I am. very respectfully,
JNO. JAY KNOX,
Comptroller.

Hon. JOHN SHERMAN,
Chairman, Committee on Finance, United States Senate.

Figure 17: *TBA.*