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ABSTRACT

U.S. Bank deposits by individuals grew from 4% of GDP at the time of the National Banking Acts in 1863-64 to 23% by the time of the Federal Reserve’s founding. A comprehensive collection of bank-level data shows that most gains occurred immediately after the Acts, Specie Resumption in 1879, and the Election of 1896, and occurred across banks of all ages and types. Checking accounts, clearinghouses, rising incomes, and urbanization contributed to the increasing preference for deposits, but greater confidence in banks also seems to have been central, with highly capitalized banks from earlier entry cohorts seeing the largest gains.

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1. Introduction

Despite the pervasiveness of deposits in banking systems today, personal banking accounts were not always so popular. Before the Civil War, the majority of bank liabilities in the United States took the form of dollar-denominated notes issued by individual banks. This changed over the fifty years of the National Banking System (1863–1913), when individual deposits expanded from about four percent of gross domestic product (GDP) to more than 23 percent. The rise in relation to bank capital is just as extraordinary, with deposits rising from 111 percent of capital to 574 percent. What caused the transition from a focus on bank notes to an “Age of Deposits” that persists in the United States to the present day? General economic growth and changes in financial regulation can account for part of the rise, but the introduction of clearinghouses and checking accounts along with greater public confidence in banks were also at play. Econometric analysis of the relative contributions of these factors, however, has always been limited by a lack of the digitized bank-level data. We conduct such an analysis by collecting data on over 14,000 individual banks in existence before 1913, and relate factors associated with economic activity, financial innovations, and depositor confidence to the growth and distribution of individual deposits across banks and over time.¹

Friedman and Schwartz (1963) and James (1978) describe the time path of aggregate deposits over the National Banking period and offer several hypotheses for their rise such as the utility of checking accounts for making payments, increases in national income, and the spread of the market economy through urbanization, but could not test these hypotheses empirically.

¹ Because we are interested in consumer preferences over bank liability types, we focus on individual deposits rather than interbank or government deposits. We therefore refer to “individual deposits” and “deposits” interchangeably, considering interbank balances as a distinct quantity when applicable. Individual deposits include both personal and commercial deposit accounts because they were not separated in financial reports of the period.

Other studies using bank-level data focus on large financial centers or more isolated areas. James and Weiman (2011) and Rousseau (1998, 2011), for example, examine deposit growth in New York City, while Krueger (1933) and Keene (1974) examine deposit growth in Wisconsin. All find specific reasons for local increases in deposits but do not test whether they can be applied to the nation as a whole.²

We gather two annual bank-level databases for our broader analysis. The first contains balance sheet information on each national bank from 1865 through 1913, and allows us to study a geographically-diverse set of banks over a long time period. The second contains balance sheet information on both state and national banks in six Midwestern states (Indiana, Michigan, Minnesota, Ohio, Pennsylvania, and Wisconsin) from 1880 through 1913, which permits us to examine whether state banks operated differently than national banks and whether the aggregate growth that we observe was concentrated in certain types of banks. To test the various hypotheses for the rapid ascent of individual deposits, we link deposits to a county's population, the availability of clearing facilities, U.S. bond prices, and measures of confidence in individual banks such as capital levels and the number of years in business.

The first sharp rise in deposits relative to GDP occurred after the passage of the National Banking Acts in 1863 and 1864. The ratio also rose rapidly after the resumption of specie payments on government-issued notes in 1879 and following the election of 1896. Remarkably, the ratio of deposits to bank capital doubled within two years of each event, never to return to its earlier levels. The increases occurred across all banks – whether old, new, state-chartered, or

² James and Weiman (2011) describe the conversion of banks in New York City from state to national charters at the end of the Civil War as instrumental to initiating the rise in deposits. Rousseau (2011) emphasizes the effects of published bank stock prices on the distribution of deposits across New York banks through 1897.

national – suggesting that the rise in deposits was caused by system-wide factors rather than idiosyncratic or location-specific ones.

Looking at the deposits of individual banks, their growth does not seem driven by any single factor. We do find, however, that factors plausibly related to a depositor’s confidence in a particular bank were important, and that deposits would have followed a very different trajectory without them. It turns out that deposits accumulated most rapidly in older and more highly capitalized banks. Clearinghouses and the avoidance of bank closures also explain a significant part of the longest sustained episode of financial deepening in the nation’s history.

2. Aggregate individual deposits, 1800-1913

Before turning to the bank-level data, it is useful to consider aggregates for the nation. Figure 1 presents aggregates for the number of state and national banks (panel a), the ratios of deposits, circulation, and capital to GDP (panel b), and the ratios of deposits and circulation to capital (panel c) from 1800 through 1913.³ The number of banks in operation is a general measure of financial development that reflects extensive growth in banking. Increases in the ratio of deposits to GDP indicate that individuals as a whole were placing more of their income in deposit accounts.⁴ The fresh deposits could appear on the extensive margin from new accounts in recently-formed and existing banks, or intensively as additional deposits in existing accounts. Increases in the ratio of deposits to capital, holding other liabilities constant, reflect compositional shifts on the liability side of bank balance sheets.

³ We describe the sources of the aggregate data in Appendix A. Estimates of annual GDP are from Johnston and Williamson (2013).

⁴ Given that GDP was growing more rapidly than the population, the rise in deposits with respect to GDP also implies increases in deposits per person.

There was relatively little deposit growth before 1860. The ratio of deposits to GDP saw only a small rise before 1820, while the ratio of deposits to capital was relatively steady across the entire period. The lack of growth is not surprising given that deposits were not the dominant bank liability before the Civil War. Rather, banks issued paper notes that circulated among the public and were payable on demand in specie at the issuing bank. Banks preferred notes as they could issue large amounts while keeping only a fraction of their value in the vault as cash. The public may have even preferred notes because they were useful in transactions and deposits were not subject to required reserves. Therefore, while circulation declined over the period, banks in 1860 still had as much value outstanding in the form of notes as they attracted in deposits.

The first substantive expansion of deposits began in 1863, with panels (b) and (c) of Figure 1 showing a rise from 101 percent of bank capital to 134 percent by 1868. The ratio of deposits to GDP more than doubled from 3.8 to 7.7 percent over the same period. These were the largest five-year increases in deposits achieved at any time before 1870, but unlike previous periods the expansion had only just begun. Indeed, it was not until the Panic of 1907 that the ratio ever declined over more than one year, and by 1913 the ratio of individual deposits to GDP stood at 23 percent.

The ratio of deposits to capital also rose substantially during the National Banking period, but more closely resembles a step function with three large jumps. The ratio grew from 59 to 132 percent between 1860 and 1866, from 136 to 244 percent between 1879 and 1884, and from 258 to 498 percent between 1896 and 1901. As a result, by 1913 the ratio of deposits to bank capital had reached 574 percent -- ten times its value in 1860. Given that the rise occurred across all regions of the country (see Appendix B), these dates seem related to events that stabilized and established confidence in the nation's monetary and banking systems.

The start of the sustained growth in deposits roughly corresponds to the National Banking Acts. Though designed to raise revenue for the Union during the Civil War, the Acts also lowered default rates by making bank entry requirements more stringent. This was accomplished through creation of the Office of the Comptroller of the Currency, a nationwide requirement that national banks back their note issues with holdings of U.S. bonds, and increases in capital and reserve requirements.⁵ The reserve requirements on deposits in particular increased the security of deposits, encouraging individuals to take advantage of deposit accounts as vehicles for saving. To raise additional revenue and gain control over note issues across the system, Congress followed the Acts with a ten percent tax on outstanding notes of state banks that went into effect on July 1, 1866. Taken together, these changes led to larger banks and the substitution of deposits for circulation.⁶

The growth in deposits during the 1860s was not driven solely by new bank formation. Existing banks that adopted national bank charters also saw large increases in individual deposits. Figure 2 shows average balance sheet quantities from 1850 to 1860 and from 1865 to 1875 for state banks that converted to a national charter before 1868.⁷ Each panel contains a linear time trend based on the 1850-60 data which suggests that state banks altered their liability

⁵ Before the National Banking Acts, bank notes circulated at varying discounts from their par values depending on the bank of issue and where they were being used. The new collateral requirements for backing national bank notes and the Comptroller's guarantee of redemption in the case of default were sufficient to eliminate the discounts and the need for bank note reporters.

⁶ Another reason why deposits grew sharply after the Acts was a provision that placed a \$300 million ceiling on the aggregate notes of national banks, which was reached in 1866 (Sylla 1969, p. 663). With additional circulation no longer possible, banks turned to deposits as a liability. The ceiling was raised to \$354 million in 1870 and removed entirely in 1875, but rising collateral prices had by then made circulation less attractive given that reserves on deposits could fall significantly before reaching the minimum required ratios (Cagan 1963, Figure 2, p. 33).

⁷ The gap is due to non-reporting of individual banks during the Civil War.

structures after switching to a national charter. Panel (a) shows that by 1865 the average value of a bank's deposits was \$175,000 higher than expected if deposits had followed their pre-war trend, and panel (b) shows that converted banks also tended to increase their circulations. Interestingly, panel (c) indicates that capital levels remained on trend.

The resumption of specie payments in 1879 after an 18-year suspension marks the second jump in deposits, and represents a restoration of both domestic and international confidence in the nation's financial system.⁸ Congress took a gamble when it passed the Resumption Act in 1875 which mandated a return to specie payments at par on January 1, 1879, but took no significant direct actions to assist in its implementation.⁹ Mitchell (1908) argues that the success of the legislation was far from certain at the time, and Kindahl (1961) demonstrates that parity was only reached by late 1878. The plan's success helped restore confidence by removing the immediate threat of bank runs and specie drains, and also ended the sharp deflation that had been required to absorb the Greenback issues of the war at par. The policy brought forth capital inflows from abroad and a moderate rise in U.S. prices relative to British prices, both of which were conducive to economic growth.

The remarkable growth in deposits after 1896 corresponds to the end of the free silver movement. While the nation had largely been under a de facto Gold Standard since 1873, the populist movement argued for the return of silver money and the subsequent inflation that it

⁸ While the nation was officially on a bimetallic standard, the Coinage Acts of 1834 and 1873, which respectively reset the mint ratio to devalue silver and stopped the monetization of silver, effectively had the nation on a Gold Standard. But the government continued to make concessions toward silver and the free silver movement despite the Acts, and it was not until 1896 that the movement was finally put to rest.

⁹ The Act only authorized the Treasury to build up specie reserves in case they were needed to stop a speculative attack, and while this did occur right before resumption, there was no run.

would bring. The movement was concentrated in agricultural regions, but was large enough to affect expectations more generally. Friedman and Schwartz (1982, p. 629) write that “before 1896, the political strength of the free silver movement made it entirely reasonable for farsighted investors to anticipate inflation,” while Calomiris (1993) describes a growing apprehension among the public that the movement might lead to a cessation of gold convertibility. The movement came to an abrupt end with the presidential election of 1896, not only because the Democratic Party and Bryan’s free silver platform were soundly defeated, but also because gold became more readily available around this time due to the discovery of new mines and mining technology. The clear support for a single monetary basis eliminated the potential for suspension or inflation due to an excessive monetization of silver, and the Gold Standard Act of 1900 then formally committed the nation to this course.¹⁰

3. Bank-level data

We use the dataset digitized and described in Jaremski (2013) to examine individual national banks for entire period. Culled from the Comptroller of the Currency’s *Annual Report*, the data contain the annual balance sheet of every national bank in operation during the third quarter of each year. Data are missing for 1885 when balance sheets were not reported and for 1905 when individual deposits and interbank deposits were combined. While there is some possibility of window dressing early in the data, the Comptroller effectively randomized the call date after 1869 in order to gain a more accurate view of balance sheets.

Because most states did not report balance sheet data until relatively late in the National Banking period, we cannot achieve the same coverage for state banks. Nevertheless, to compare

¹⁰ Bordo and Rockoff (1996) illustrate the benefits of adherence to the Gold Standard in the international capital markets.

national and state banks at the bank-level, we collected balance sheet data for individual state banks from the available state reports of Indiana, Michigan, Minnesota, Ohio, Pennsylvania, and Wisconsin.¹¹ Data are missing for Indiana in 1880, 1882, and 1884, Michigan in 1882, Minnesota in 1883, Ohio in 1883, 1889, 1893, and 1902, and Wisconsin in 1883, 1885, and 1887.¹² We use data from these states for a variety of reasons. First, banking data for these states are available for a large number of years. Second, these states had only a few pre-existing financial centers that might affect our comparison of bank types. Finally, because banks in these states operated in a wide range of locations including urban and rural areas, we argue that they provide a representative sample of the nation as a whole and that conclusions drawn from them are likely to generalize.¹³

In all, the data represent the largest collection of post-bellum balance sheets in existence. The national bank database starts in 1865 and contains 166,616 observations from 10,642 banks, whereas the Midwest database starts in 1880 and contains 70,597 observations for 2,479 national

¹¹ Data for Indiana are from the *Annual Report of the Auditor of State of the State of Indiana*. Data for Michigan are from the *Annual Report of the State Treasurer of the State of Michigan* before 1889 and the *Annual Report of the Commissioner of the Banking Department of the State of Michigan* thereafter. Data for Minnesota are from the *Report of the Public Examiner of the State of Minnesota to the Governor* before 1910 and the *Annual Report of the Banking Department of the State of Minnesota* thereafter. Data for Ohio are from *Annual Report of the Auditor of State to the Governor of Ohio*. Data for Pennsylvania are from the *Reports of the Several Banks and Savings Institutions and Banks Organized under the Free Banking Law of Pennsylvania* before 1895 and the *Annual Report of the Commissioner of Banking* thereafter. Data for Wisconsin are from the *Semi-Annual Statement on the Condition of State and Private Banks of Wisconsin* before 1895, the *Annual Report of the Bank Examiner* from 1896 to 1902, and the *Annual Report of the Commissioner of Banking* thereafter.

¹² We fill missing balance sheet observations using a linear trend to avoid years when only one type of bank was observed in a state.

¹³ The Northeast was the only other region with data available for the period, but given the region's large number of existing banks in 1860 and high concentration of savings banks and trust companies, it is not well suited for our study.

banks and 3,954 state banks.

4. Explaining deposit growth

Accounting for the rise of deposits requires distinguishing the contributions of growth in population, income, regulation, and the number of banks themselves from less easily quantified yet fundamental shifts in confidence, individual preferences, and business practices. In Section 2 we established that deposits per bank rose sharply after the National Banking Acts, resumption of convertibility in 1879, and the election of 1896. We now discuss the role of bank and local characteristics in effecting the rise. Next, we explore econometrically the determinants of deposit taking among all national banks after 1865, and the relative behavior of national and state banks in the Midwest sample after 1880. Finally, we examine the growth of deposits in national banks using county-level data.

4.1. Determinants of deposits

While there are few studies devoted to the determinants of deposit growth, many authors provide insights into their pattern. In this section, we highlight and discuss these factors before exploring them empirically at the bank and county-levels.

4.1.1. Checking accounts

The growth of deposits is often associated with the increasing use of checking accounts, which allowed customers to access funds easily and served as a substitute for bank notes. While most states did not separate checking from deposits accounts in their records, the Comptroller's reports include disaggregated data on checking accounts for a few years. These data indicate that 96.7 percent of bank receipts in reserve cities and 81.7 percent outside of them were already in the form of checks and drafts by 1881. There is also little change in these shares between 1881

and 1890, a fact that led James (1974, p. 25) to assert that “checks were already widely in use by the end of the Civil War.”

The expansion of clearing facilities also likely encouraged individuals and banks to use deposit accounts more intensively. Clearinghouses were large institutions that sorted and processed checks, lowering a bank’s cost of accepting them. Early clearinghouses were concentrated primarily in the Northeast, but moved into the Midwest during the 1880s (Jaremski 2014). Areas in the South and West eventually established a few clearinghouses but they never covered a large portion of these regions. We might therefore expect clearinghouses to explain local deposit growth but not the rise across all banks.

The expansion of the banking system itself might also have increased the demand for checking, with drafts between banks with correspondent relationships more likely to be accepted.¹⁴ As the utility of checks depends crucially on their acceptability, a large number of banks in a location would increase consumer demand for such accounts. Competition among local banks could also encourage higher interest rates on deposits to attract funds.

4.1.2. The return of state banks

Another major hypothesis for the rise in deposits is the rapid resurgence of state banking after 1880. Because of the bank note tax, state banks could operate only if they had sufficient deposits, and this provided a strong incentive to pursue depositors aggressively and to institute new technologies. The lower entry requirements of state banks also allowed them to open in rural areas where deposit accounts had been previously unavailable. In this way, the sudden influx of

¹⁴ Friedman and Schwartz (1963) are among many to also advance this view.

state banks during the 1880s might have encouraged deposit growth.¹⁵

Figure 3 indicates that state banks were not solely responsible for the rise in deposits. First, national banks held nearly twice the aggregate deposits as state banks from 1864 to 1913 despite their exclusive ability to issue notes. Second, national banks did not have a dramatically lower ratio of deposits to capital than state banks. Finally, deposits in state and national banks as well as their ratios of deposits to capital saw comparable growth patterns, with the only important deviation across the two bank types coming after the Panic of 1907 when state bank deposits began to decline and national bank deposits continued to grow.

4.1.3. Reputation

Studying deposit growth in New York City over the second half of the 19th century, Rousseau (2011) argues that confidence and reputation of banks were important determinants to fluctuations in deposits. While we do not have a precise measure of how banks were viewed by the public, we can look at an indirect measure of reputation: bank age. Older banks were often better capitalized and could establish a reputation over a number of years, and these factors could increase confidence among depositors and lead them to prefer established banks. Banks that survived the Civil War and successfully converted to national charters were in the most advantageous position. In this sense, a reputation built upon longevity, entry cohort, and capital level could allow deposits to expand without commensurate increases in capital, allowing reputation itself to substitute for it. Indeed, bank advertisements often highlighted the name, establishment date, and capital level above any other characteristics.

¹⁵ At the same time, many states adopted regulation to mimic national bank requirements. Mitchener and Jaremski (2013) show that many implemented systematic bank supervision, double liability on bank stock, and reserve requirements on deposits by 1890. These factors may have led to some convergence over time between the two bank types.

4.1.4. Bank note circulation

Among macro-level factors, the price of U.S. bonds should affect the amount of notes in circulation, and by extension the quantity of deposits.¹⁶ Panel (a) of Figure 4 shows that the aggregate ratio of circulation to capital fell when bond prices were high and rose when prices were low, as might be expected given that national banks were required to back their notes fully with U.S. bonds and high bond prices made this collateral expensive.¹⁷ On the other hand, panel (b) shows that bond prices did not have a consistently positive relation with deposits. Indeed, the rise of deposits after 1897 occurs in the face of declining bond prices. Further, the rise in deposits continued after 1900 even though the Gold Standard Act made note issue more attractive. Though there is no visual evidence of a stark tradeoff between aggregate note issues and deposits, we nevertheless test whether these factors acted to lower the pace of deposit growth in national banks relative to state banks.

4.1.5. Urbanization

The size of and economic activity in a bank's location should also influence the quantity of its deposits. For example, Cagan (1963) argues that urbanization can explain the rise observed

¹⁶ See James (1976) and Champ, Wallace, and Weber (1992) for a discussion of bank note profitability over the post-bellum period.

¹⁷ We build the bond price series from various issues of the Comptroller's reports. Since no single bond issue spans the entire National Banking period, we compute averages of several of the longer maturity bonds as they were available. To do this, we use U.S. 6s of 1865 (1865-1878), U.S. 6s of 1881 (1865-1881), U.S. 5s of 1881 (1872-1881), U.S. 4.5s of 1891 (1876-1890), U.S. 4s of 1907 (1877-1907), U.S. 5s of 1904 (1894-1903), U.S. 4s of 1925 (1895-1913), U.S. 2s of 1930 (1900-1913), and U.S. 3s of 1908-1918 (1898-1913). All bonds are as quoted in New York and expressed relative to face value. The average of the available bonds for each year is computed as the average of the monthly high and low prices in November. This synchronizes the series for bond prices with our balance sheet data.

in the aggregate. Indeed, the expanding railroad network and the rapid development of integrated national markets coincided with a wave of urbanization after the Civil War (Atack et al. 2010). Because individuals in densely populated areas were more likely to hold wealth in the form of deposits than in real estate, urbanization could have affected deposits more than increases in population alone.

4.1.6. Financial stability

The last potential reason for growth in deposits is the general stability of the post-bellum period. For example, Jalil (2015) finds evidence of only three major panics: 1873, 1893, and 1907. With the exception of 1907, the panics were less national in scope and led to fewer losses than those sustained in the antebellum period. The high capital and collateral requirements put into place by the National Banking Acts also protected depositors better from losses, allowing national banks to usually lose fewer deposits during panics. This was clearly seen in the Panic of 1907. After 1907, aggregate deposits at state banks declined despite a growth in the number of state banks, while deposits at national banks continued to grow despite a reduction in the rate of entry. As discussed by Moen and Tallman (1992), the Panic affected state banks more than national ones, with deposits continuing to grow for national banks while declining for state banks. The pattern suggests that deposit growth corresponded with stability and confidence in the banking sector.

4.2. Explaining national bank deposits at the bank level (1865-1913)

We begin the econometric analysis by exploring the determinants of deposits and circulation from 1865 to 1913 using our database of national bank balance sheets. Each observation is a bank year. The dependent variables that we consider are the logarithms of

deposits, circulation, and ratio of deposits to capital.¹⁸ The full specification is

$$\ln(Y_{i,t}) = a + \beta_1 X_{i,t} + \beta_2 Z_{i,t} + t_t + u_i + e_{i,t}, \quad (1)$$

where $X_{i,t}$ is a vector of county-level variables including the number of other national banks in year t , the number of national banks that closed or merged over the previous ten years, and a binary variable for whether the county had a clearinghouse located within its borders. $Z_{i,t}$ is a vector of bank-level variables including the logarithm of capital stock and dummy variables for the decade in which the bank started operations. We also include fixed effects for years (t_t) and states (u_i).

Table 1 presents the results. Both the presence of a clearinghouse and other banks in the county are positively related to an individual bank's deposits and the ratio of its deposits to capital, and negatively related to its circulation, with coefficients that are statistically significant across all specifications. The coefficient on the clearinghouse variable indicates that national banks in areas with a clearinghouse, despite an array of other control variables, could expect to attract nearly 8 percent more deposits than those without ones. These results are expected given that clearinghouses presumably improve the efficiency of non-cash payment services and, clearinghouse or not, more local banks generate demand for interbank transfers through checks. The number of closed banks in a county over the previous ten years has a negative on a bank's deposits, circulation, and the ratio of its deposits to capital, all of which are statistically significant at the one percent level. This suggests that bank closures in a county tend to make individual depositors more wary of placing funds in a given bank with its boundaries. The capital stock of each bank relates positively to both deposits and circulation and is also statistically significant at the one percent level. Because capital is as much a scaling variable in these models

¹⁸ We deflate all dollar values to an 1870 basis using deflators from Officer (2008).

that controls for bank size as a measure of stability and reputation, the findings are also as expected.

Most striking, however, are the second columns of each panel, which include dummy variables for the decade of a bank's entry. With capital already in the specification and time controlled with year fixed effects, these cohort indicators strongly suggest that banks in operation longer, and perhaps those entering in particular earlier periods, secured more deposits and maintained higher ratios of deposits to capital than banks entering later in the National Banking period. If longevity engenders confidence, older banks that had survived multiple banking panics were likely perceived as models of stability and sound management. Indeed, the cohort effects suggest that bank depositors lodged their surpluses in banks that they considered safe.¹⁹ Column (2) of Table 1 indicates that, after controlling for bank size, national banks that entered earlier had consistently higher levels of deposits than those entering later. For example, a national bank in existence before 1870 could expect to have 12.4, 16.5, 34.9, and 75.9 more deposits than banks entering in the 1870s, 1880s, 1890s, and 1900s respectively. Column (6), though not as striking as column (2), shows that this general relation holds for the ratio of deposits to capital as well. Banks that entered before 1880, again controlling for size, had more circulation than those entering later.

Figure 5 plots the coefficients on the year fixed effects associated with the specifications in columns (2) and (6) of Table 1. Note that even after our attempts to control for bank-level and local factors, the three main events (National Banking Acts, Resumption, and the Election of

¹⁹ Rousseau (2011) comes to a similar conclusion for clearinghouse banks in New York City by showing that depositors responded to another publicly-available signal of quality, namely the price of a bank's equity shares.

1896) still coincide with sharp increases in deposits generally and are thus strong candidates for system-wide forces reflecting general confidence in banks.

4.3. National and state bank deposits in the Midwest (1888-1913)

We now examine individual state and national banks together in our sample of Midwest states (Indiana, Michigan, Minnesota, Ohio, Pennsylvania, and Wisconsin) from 1888 to 1913, where bank-year is again the observational unit. The dependent variables are the logarithms of deposits and the ratio of deposits to capital.²⁰ The full specification is:

$$\ln(Y_{i,t}) = a + \beta_1 X_{i,t} + \beta_2 (X_{i,t} * Nat_i) + \beta_3 Z_{i,t} + \beta_4 (Z_{i,t} * Nat_i) + t_t + u_i + e_{i,t} \quad (2)$$

where $X_{i,t}$ is a vector of county-level or nationwide variables and $Z_{i,t}$ is a vector of bank-level variables. Because the Midwest sample contains observations for both national and state banks, we examine the effects of each bank type on deposits using a dummy variable set to unity if bank i is a national bank, and the differential effects of each variable on the bank types by interacting the X and Z vectors with the dummy variable. We also include fixed effects for years (t_t) and states (u_i).

Table 2 presents the findings. In all specifications, the value of a given bank's deposits or ratio of deposits to capital relates positively to the number of state banks in its county. This suggests that deposit-focused banks in a county created an externality through interbank linkages that encouraged banks in general to increase deposits. Deposits relate negatively in all cases to the number of bank closures over the previous ten years, indicating that closures made potential depositors wary of placing funds with existing banks. In the left panel, the level of capital always relates strongly to deposits as expected.

²⁰ We do not examine circulation because state banks were prohibited from circulating notes.

When included, the dummy variable for whether bank i is a national bank has a positive and statistically significant coefficient for the log of deposits but not for the log ratio of deposits to capital. When the dummies variables for decade of entry appear in columns (2), (3), (5), and (6), and with banks that started before 1890 as the omitted category, the coefficients on deposits decline with the lateness of entry. If banks that existed before 1890 had more established reputations, perhaps confidence among the public made it possible for them to attract more deposits.

Columns (3) and (6) add interactions between the national bank dummy and other explanatory variables in the model. Here we see that the presence of other national banks in bank i 's county relates to more deposits or higher deposit ratios if bank i is a national bank and fewer deposits if it is a state bank. The presence of state banks in the county also has a smaller effect on deposits in national banks than in other state banks. The interaction of the national bank indicator and the level of U.S. bond prices shows the expected positive relation between bond prices and deposits for national banks. This is likely because only national banks issued notes and were thus affected directly by bond prices through the cost of collateral.

Figure 6 plots the coefficients on the year fixed effects from columns (3) and (6). In each panel, the plot shows that, even after controlling for bank-level and local factors, a general rise in deposits and their ratio to capital is apparent in our bank-level data starting around 1896.

4.4. National bank deposits at the county-level (1870-1913)

The bank-level data allow us to control for key historical events, yet their high frequency precludes the inclusion of local factors such as population and urbanization that are observed only with the decadal censuses. To account for these factors and focus on the intensity of banking activity, we aggregate the data on individual national banks throughout the United States

to the county-level and match them to decennial Census data collected by Haines (2004).²¹

Aggregation at the county level allows us to average out idiosyncratic components in individual bank balance sheets. The baseline specification is:

$$\ln(Y_{i,d}) = a + \beta_1 \ln(\text{Pop}_{i,d}) + \beta_2 \text{Urban}_{i,d} + \beta_3 \ln(\text{Farm}_{i,d}) + \beta_4 X_{i,d} + t_d + u_i + e_{i,d} \quad (3)$$

where the dependent variables are the logarithms of deposits, circulation, and bank capital, all measured in the Census year (i.e., 1870, 1880, etc.) on a per capita basis and deflated to reflect 1870 dollars. $\text{Pop}_{i,d}$ is the number of people living in the county, $\text{Urban}_{i,d}$ is the percent of the population living in a location with more than 25,000 persons, and $\text{Farm}_{i,d}$ is the per capita value of farm land in the county. $X_{i,d}$ is a vector of county-level banking variables including the number of national banks that closed over the previous ten years and indicators for whether there was a clearinghouse in operation or whether the county had a bank that converted from a state to national charter in the 1860s.

The regression results in Table 3 indicate that more urbanized counties had higher deposits, circulation, and bank capital per person, which suggests a relation between the intensity of banking services and the economic activity associated with greater population density. Given that such counties were more likely to operate a clearinghouse, it is not surprising that the coefficients on this indicator are also positive and statistically significant in all specifications. After controlling for urbanization and clearinghouses, the population variable itself relates to more deposits but less bank capital per person. This is reasonable given that the income threshold for having a deposit account is likely much lower than for contributing bank capital, and urban areas are likely to have broader distributions of income than less urban ones. Wealthier counties,

²¹ We form a panel by excluding counties that had significant boundary changes between 1870 and 1913 as well as observations for which there were no banks in a given county.

as measured by the value of farms per thousand persons, relate positively and significantly to all three measures of banking intensity. Bank closures seem to lower banking activity, but the coefficients tend to hover around the 10 percent level of statistical significance.

Most remarkable is the positive and highly significant effect of having an early bank in a county on later banking intensity therein. Had we not already controlled for wealth, population, and urbanization, one might think that an early bank was just an indicator of economic potential. But with these controls in place, we interpret the coefficient as a measure of confidence in banks or at least familiarity with the benefits of banking services. Banks that had converted from state to national charters in the 1860s and remained in existence were ones that county residents had recognized for some time, and their survival may have served as a testimonial to the security afforded by a well-managed bank. Being more acclimated to banks and banking services than counties that saw their first bank only later in the century, residents of such counties were most likely to use deposits and accept bank notes in transactions as the age of deposits took hold.

5. Conclusion

Deposits grew from 5 to 24 percent of GDP between 1860 and 1913. A comprehensive bank database shows that the aggregate growth in deposits was mainly caused by bank entry while the growth of deposits at the bank-level was mainly caused by historical events. Specifically, bank deposits across all banks rose sharply after the National Banking Acts, the resumption of 1879, and the Presidential Election of 1896. The nation's embrace of deposit banking thus seems driven by the stability of the monetary system and the confidence that individuals held for the safety and utility of established and well capitalized banks. A series of bank-level and county-level regression models confirm these patterns in disaggregated data for all national banks over the entire postbellum period and for a comprehensive sample of state and

national banks for a selection of Midwest states after 1890. At the same time, we also find support for traditional explanations for the rise in deposits such as increasing incomes, urbanization, and more widespread clearing facilities.

Economic historians well before even Friedman and Schwartz suspected that confidence among the public was central to the rise of deposit banking, and the lack of such confidence seems alive and well in many of today's emerging and not-so-emerging markets. Given that most bank liabilities were in the form of redeemable bank-issued notes before the Civil War, we investigate how subsequent financial innovations may have contributed to a shift in U.S. preferences, but also find that measures of confidence provide strong explanatory power. Perhaps it is natural that they should, given that in order for demandable debt contracts to gain acceptance, there must be confidence that they are indeed "demandable." We consider our contribution a step toward assembling the hard evidence required to raise the status of "confidence" from a reasonable hypothesis for a gain in momentum over the "Age of Deposits" to an empirical construct that can be plausibly measured and assessed.

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Appendix A: Aggregate Deposits Data Construction

The aggregate data comes from a variety of sources. Data for the antebellum period are from two databases collected by Weber (2005, 2008). The first is a census of banks that provides the location and dates of operation for each bank ever in existence before 1861. The second contains items from their annual balance sheets including information on size and portfolio composition. While the most complete source of bank data for the period, balance sheet data are missing in some years for several banks, and a few banks have no balance sheet data available at all. The gaps occurred most frequently for years prior to 1830 and for banks that operated for less than a year. When building aggregates we linearly interpolate across missing observations in a single bank's time series. As nearly all the gaps are for single years and other banks display no large jumps, the interpolation should not bias our aggregates. To fill observations for banks that lack any balance sheet data, we use the average values of their closest geographic neighbors.²² Because banks in a given area often had similar balance sheet compositions, the matching process should lead to reasonable aggregates for examining general trends in liability structures.

The decline of state banks for some time after 1861 and their resurgence after 1880 creates challenges for building a comprehensive bank-level dataset for the postbellum era. But we at least have full coverage for national banks from the *Annual Report of the Comptroller of the Currency*. To facilitate building an aggregate series of banking variables that includes state banks, we obtain the total number and aggregate balance sheet composition of state banks for

²² For banks missing balance sheet data altogether, we fill in using the average values of the lower quartile of the bank's closest geographic neighbors. The process begins by matching banks in the same county. Banks without an immediate match are then matched with banks in the same state.

1861-1863 and 1873-1913 as reported by the Comptroller.²³ To fill in the missing years, we assume that state banks adjusted their balance sheets linearly from the average per bank in 1863 to the average in 1873 and apply the interpolated average to the number of state banks. This approach produces smooth aggregate statistics with estimates that merge seamlessly into the actual series and match the national bank averages that display no sharp jumps during the period.²⁴

Appendix B: Regional Deposit Growth

Davis (1965), Sylla (1969), and James (1978) emphasize the large regional differences that existed before 1900. They argue that the lack of banking in rural areas allowed some banks to act as monopolists and charge high interest rates. In Figure A1, we break banks into five groups: reserve city national banks and country banks located in each of the four geographic regions (i.e. Northeast, Midwest, South, and West).²⁵ The data show large regional differences in

²³ The data for 1861-1864 are from the Comptroller of the Currency (1908, Table XXIV, pp. 436-437). Data for 1873-1913 are from individual issues of the Comptroller's reports.

²⁴ Note also that the number of state banks was small compared to national banks between 1865 and 1872. For example, there were 349 state banks and 1,512 national banks in 1865 and still only 566 state banks and 1,918 national banks in 1872. The average state bank was also less than half the size of the average national bank. In these ways, the state bank assumptions have relatively small effects on the aggregate values.

²⁵ The separation of reserve city banks is necessary because they were created to obtain more interbank deposits. *Reserve Cities*: New York City, St. Louis, Chicago, Boston, Cincinnati, New Orleans, Philadelphia, Albany, Cleveland, Detroit, Leavenworth, Louisville, Milwaukee, Pittsburgh, San Francisco, and Washington D.C.. *Northeast*: Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania. *South*: Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas, Kentucky, Tennessee, and Oklahoma. *Midwest*: Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas. *West*: Washington, Oregon, California, Arizona, Nevada, Utah, Montana, Wyoming, Colorado, New Mexico, and Idaho.

the levels of deposits relative to GDP as a result of their different levels of population and economic activity. Likewise, all regions displayed relatively similar growth patterns but at different rates. When deflating deposits by capital, the regions are more similar. Each saw a sudden increase in the ratio after 1879 and 1897. The evidence further indicates that the growth in deposits around the three key dates was a response to nation-wide events rather than location-specific ones.

Table 1: Bank-Level Determinants of National Bank Deposits (1865-1913)

	Log of deposits		Log of circulation		Log ratio deposits-to-capital	
	(1)	(2)	(3)	(4)	(5)	(6)
Number of other national banks in county	0.003*** [0.000]	0.004*** [0.000]	-0.002*** [0.001]	-0.002*** [0.001]	0.002*** [0.000]	0.002*** [0.000]
Number of national banks closed in county over previous ten years	-0.004*** [0.001]	-0.003*** [0.001]	-0.014*** [0.001]	-0.014*** [0.001]	-0.007*** [0.000]	-0.007*** [0.000]
Clearinghouse in county	0.079*** [0.009]	0.079*** [0.009]	-0.079*** [0.013]	-0.078*** [0.013]	0.003 [0.005]	-0.003 [0.005]
Log of capital stock	0.724*** [0.006]	0.654*** [0.007]	1.076*** [0.012]	1.046*** [0.013]		
Entered in 1870s		-0.124*** [0.031]		0.087** [0.036]		0.013 [0.016]
Entered in 1880s		-0.165*** [0.027]		-0.061* [0.034]		0.003 [0.014]
Entered in 1890s		-0.319*** [0.030]		-0.070* [0.040]		-0.047*** [0.015]
Entered in 1900s		-0.759*** [0.025]		-0.239*** [0.034]		-0.251*** [0.013]
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	166,616	166,616	166,616	166,616	166,616	166,616
R-Squared	0.5869	0.6092	0.4353	0.4412	0.45785	0.5005

Notes: The table presents results of ordinary least squares regressions. Each observation is a national bank-year, and the dependent variable is listed in the column headings. The "Entered" variables are binary variables that denote the decade when a bank started business and the omitted reference group is national banks started before 1870. All money values are deflated to 1870 dollars using Officer (2008). Standard errors appear in brackets beneath the coefficients and are clustered by state. *, **, and *** denote statistical significance at ten percent, five percent, and one percent levels, respectively.

Table 2: Midwest Bank-Level Determinants of Deposits (1890-1913)

	Log of deposits			Log ratio deposits-to-capital		
	(1)	(2)	(3)	(4)	(5)	(6)
Number of other national banks in county	-0.004*** [0.001]	-0.004*** [0.001]	-0.011*** [0.003]	-0.002*** [0.001]	-0.002*** [0.000]	-0.004*** [0.001]
Number of other state banks in county	0.015*** [0.001]	0.016*** [0.001]	0.023*** [0.002]	0.010*** [0.001]	0.009*** [0.001]	0.017*** [0.001]
Number of banks closed in county over previous ten years	-0.003** [0.001]	-0.002* [0.001]	-0.000 [0.002]	-0.006*** [0.000]	-0.006*** [0.000]	-0.005*** [0.001]
Clearinghouse in county	0.009 [0.016]	-0.006 [0.016]	-0.024 [0.038]	-0.020*** [0.007]	-0.034*** [0.007]	-0.042*** [0.014]
Log of capital stock	0.673*** [0.022]	0.559*** [0.024]	0.592*** [0.031]			
National bank dummy	0.399*** [0.037]	0.293*** [0.036]		0.011 [0.014]	-0.074*** [0.014]	
Entered in 1890s		-0.340*** [0.047]	-0.337*** [0.047]		-0.097*** [0.021]	-0.073*** [0.021]
Entered in 1900s		-1.023*** [0.041]	-1.047*** [0.040]		-0.440*** [0.015]	-0.431*** [0.016]
National*Other nat. banks			0.013*** [0.003]			0.005*** [0.001]
National*Other state banks			-0.017*** [0.002]			-0.019*** [0.001]
National*Number of banks closed			-0.004* [0.002]			-0.002*** [0.001]
National*Clearinghouse			0.030 [0.040]			0.008 [0.016]
National*US bond price			0.013*** [0.002]			0.001*** [0.000]
National*Capital			-0.093*** [0.022]			
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	70,597	70,597	70,597	70,597	70,597	70,597
R-Squared	0.4702	0.5044	0.4967	0.236	0.279	0.2694

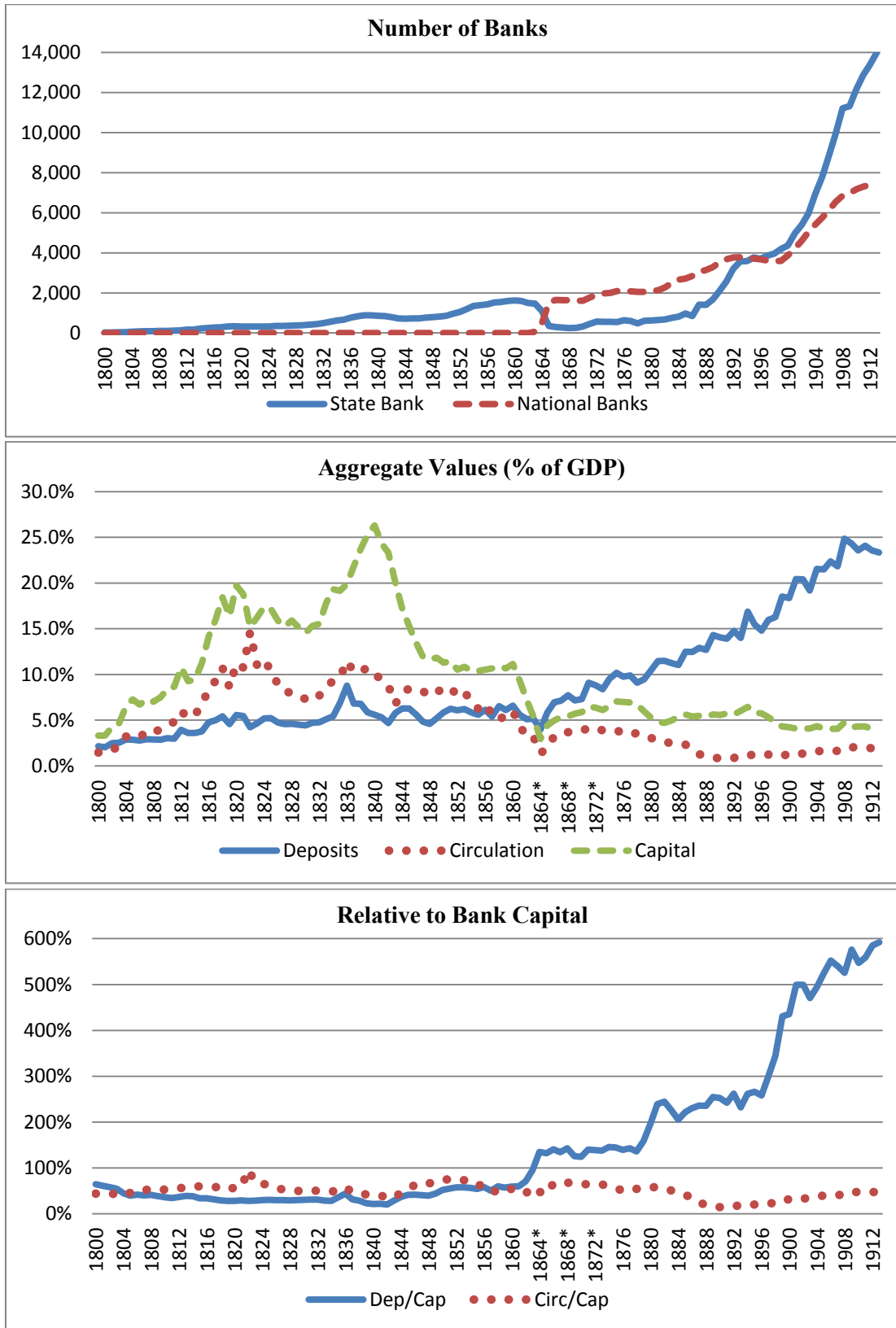
Notes: The table presents results from ordinary least squares regressions. Each observation is a bank-year, and the dependent variables are listed in the column headings. The sample only contains observations for Indiana, Michigan, Pennsylvania, and Wisconsin. The "Entered" variables are dummy variables that denote the decade when a bank started business and the omitted reference group is banks that entered before 1890. All money values are deflated to 1870 dollars using Officer (2008). Standard errors appear in brackets beneath the coefficients and are clustered by state. *, **, and *** denote statistical significance at ten percent, five percent, and one percent levels, respectively.

Table 3: County-Level Determinants of National Banking by Decade

	Counties with a Bank					
	Log of deposits per person		Log of circulation per person		Log of capital per person	
	(1)	(2)	(3)	(4)	(5)	(6)
Log of population	0.093*** [0.028]	0.055** [0.028]	0.014 [0.026]	-0.023 [0.026]	-0.054** [0.024]	-0.094*** [0.023]
Fraction of population living in area of +25,000	0.181** [0.091]	0.139 [0.091]	0.144 [0.089]	0.096 [0.089]	0.395*** [0.086]	0.353*** [0.085]
Log of farm value per person	0.032 [0.020]	0.028 [0.019]	0.078*** [0.020]	0.073*** [0.020]	0.067*** [0.019]	0.062*** [0.018]
Number of nat. banks closed over previous ten years	-0.015* [0.009]	-0.018** [0.009]	-0.009 [0.010]	-0.012 [0.010]	-0.015 [0.010]	-0.017* [0.010]
Clearinghouse in county	0.133*** [0.048]	0.136*** [0.049]	0.269*** [0.049]	0.273*** [0.049]	0.247*** [0.046]	0.252*** [0.046]
Had converted State bank		0.571*** [0.057]		0.509*** [0.045]		0.554*** [0.044]
Decade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,763	4,763	4,763	4,763	4,763	4,763
R-Squared	0.412	0.428	0.329	0.358	0.291	0.328

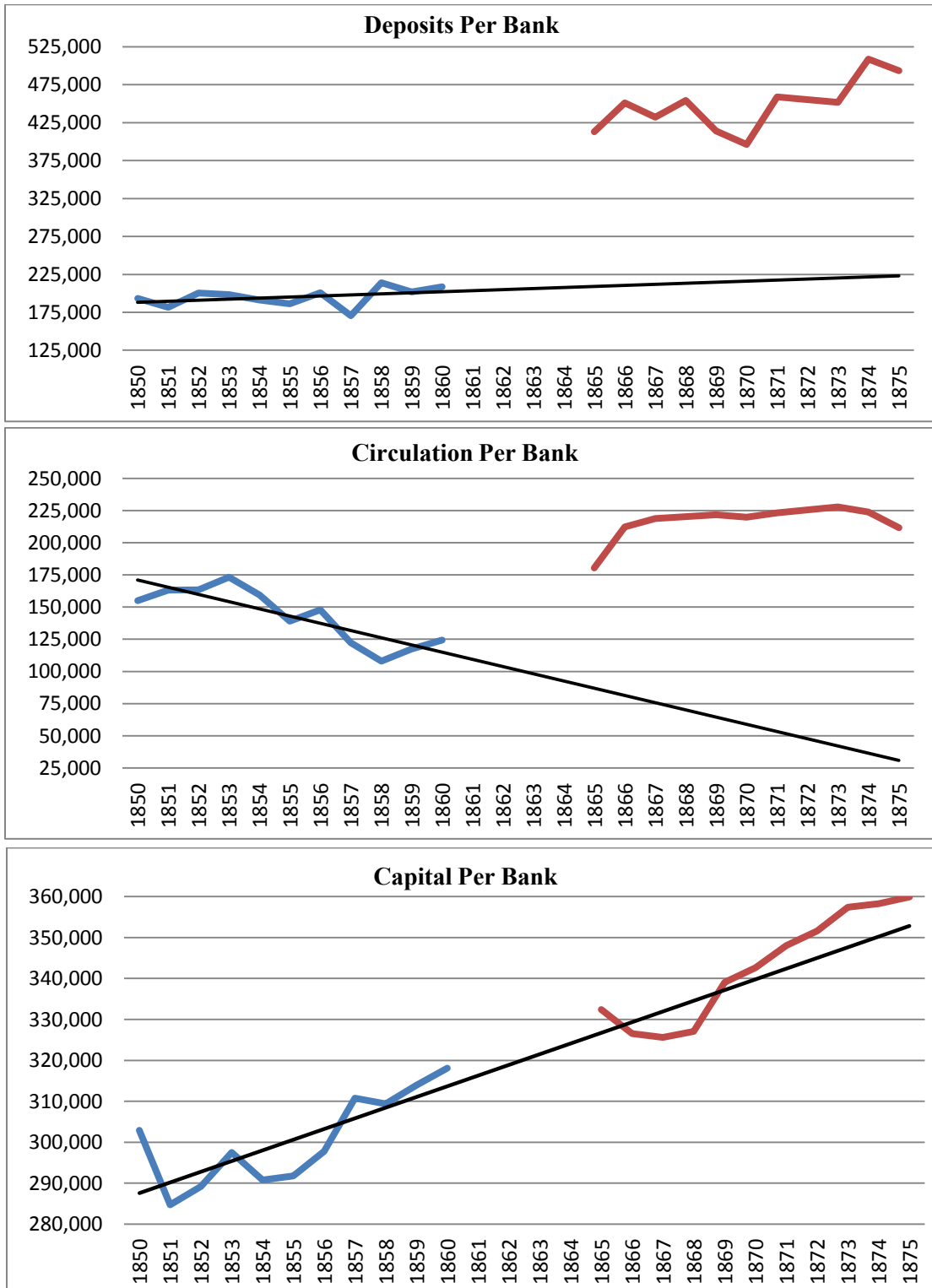
Notes: The table presents results from ordinary least squares regressions. Each observation is a county-decade. The bank sample only contains counties that had a national bank, and did not experience large boundary changes. "Had a converted state bank" denotes counties that had at least one state bank during the 1860s convert to a national bank charter. Dollar values are deflated to 1870 using Officer (2008). Non-bank variables are taken from Haines (2004). Robust standard are provided in brackets. * denotes significance at 10%; ** at 5% level and *** at 1% level.

Figure 1: Deposits Before 1914



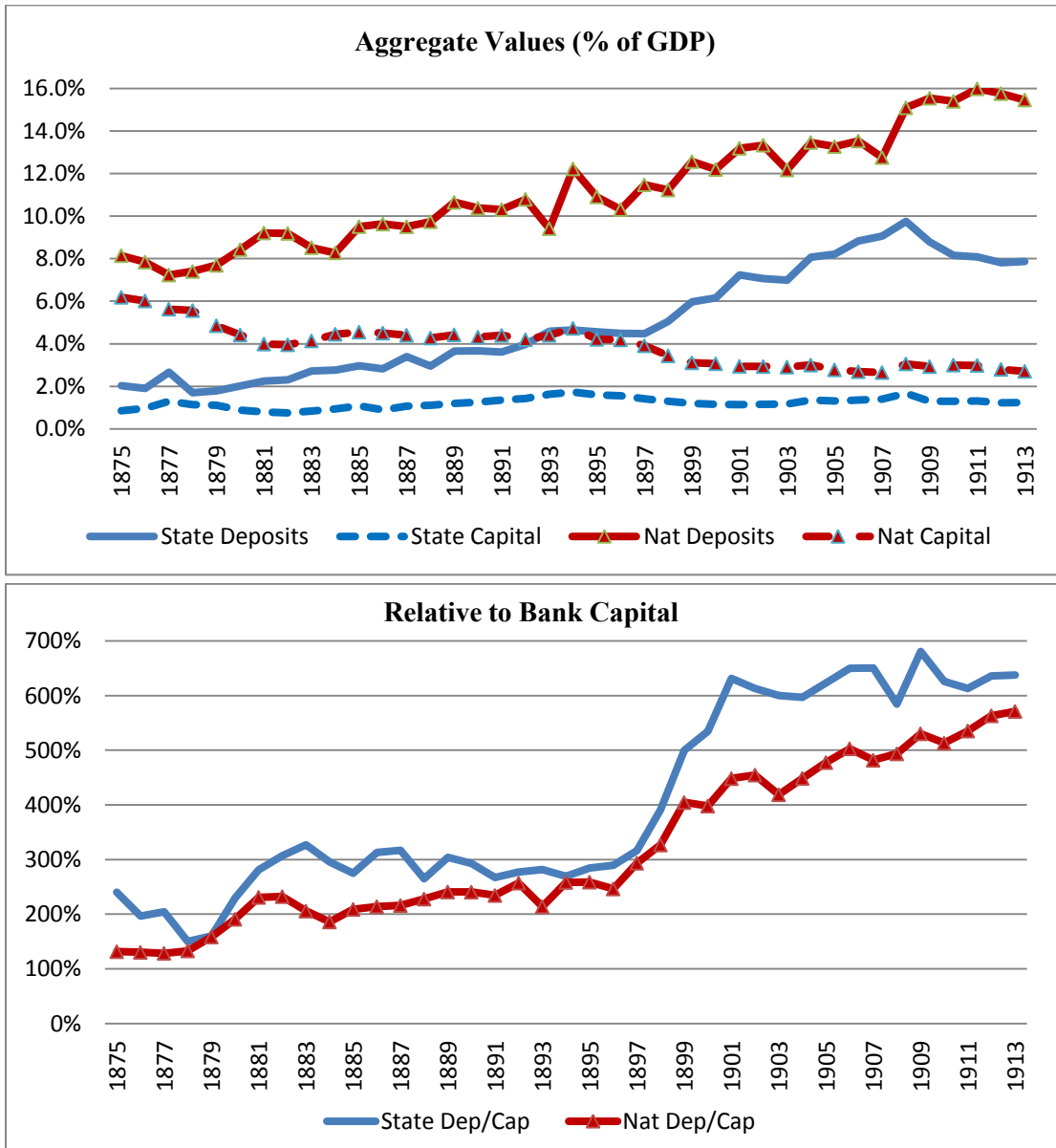
Notes: See Section 2 for data sources.

Figure 2: Changes Due to the Conversion to National Bank (1850-1875)



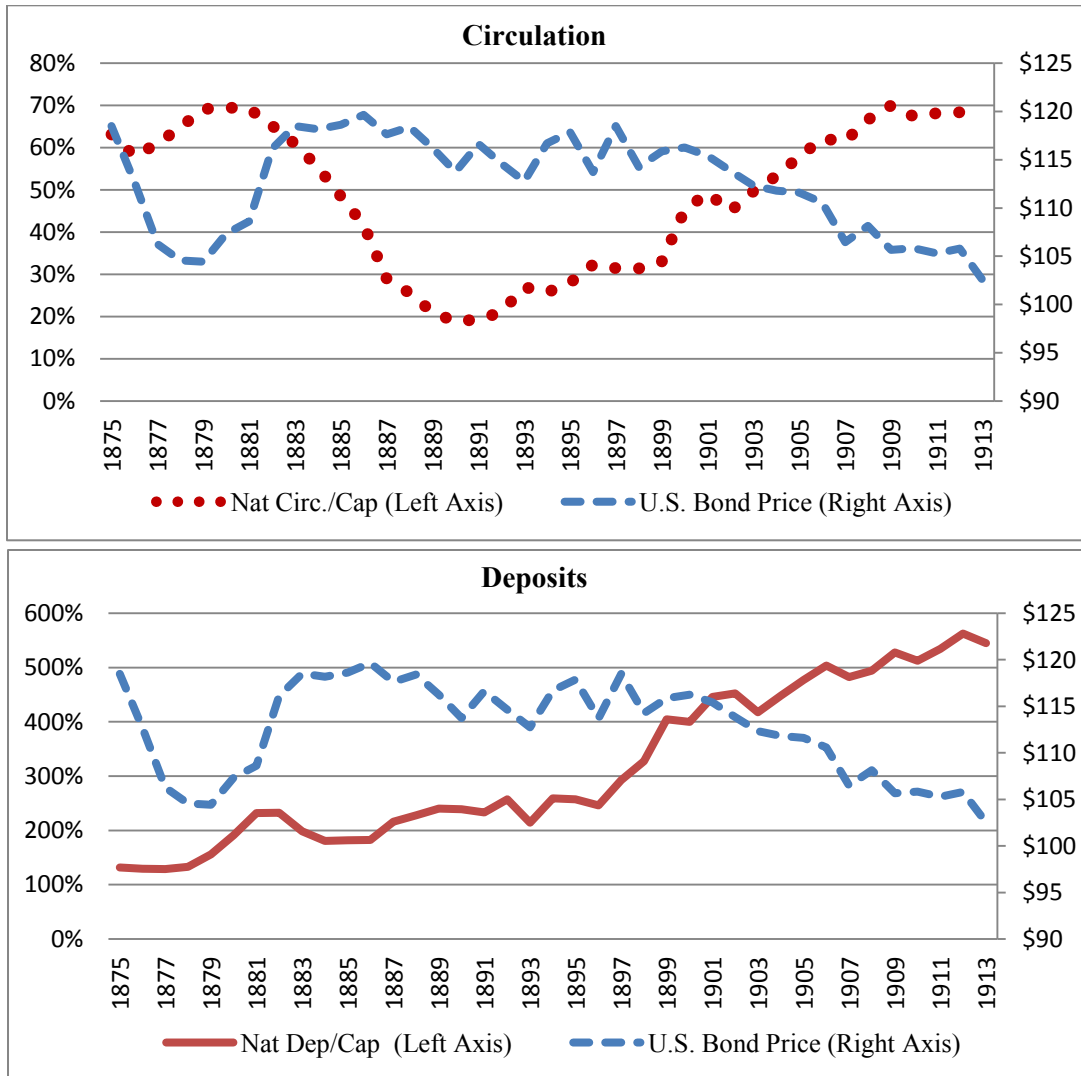
Notes: Figures display the average balance sheet variables each year for state banks that converted to a national charter between 1863 and 1868. Each panel contains a linear trend line based on the antebellum data. Bank conversions were taken from Jaremski (2013).

Figure 3: National and State Bank Deposits (1875-1913)



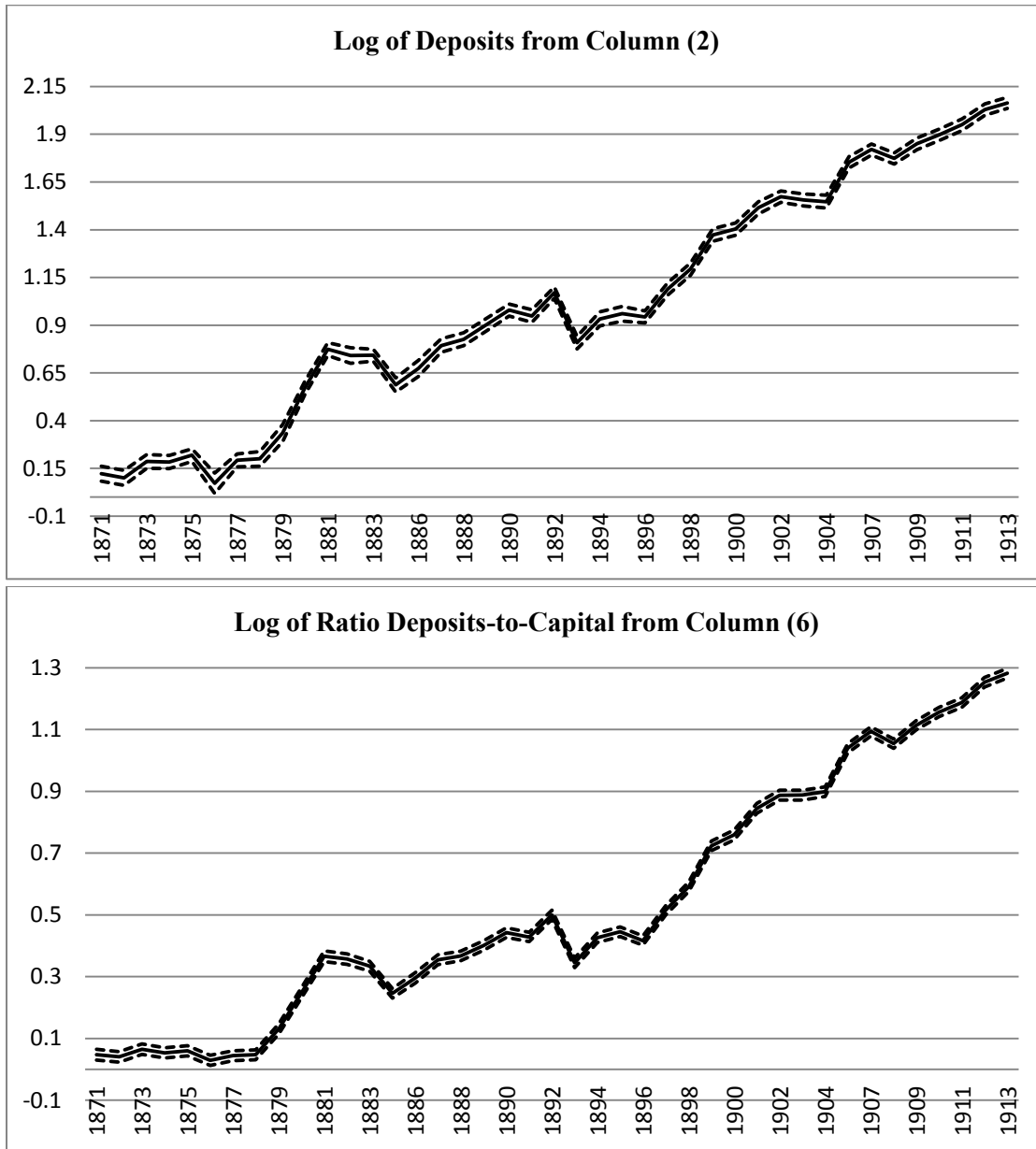
Notes: See Section 2 for data sources.

Figure 4: U.S. Bond Prices (1875-1913)



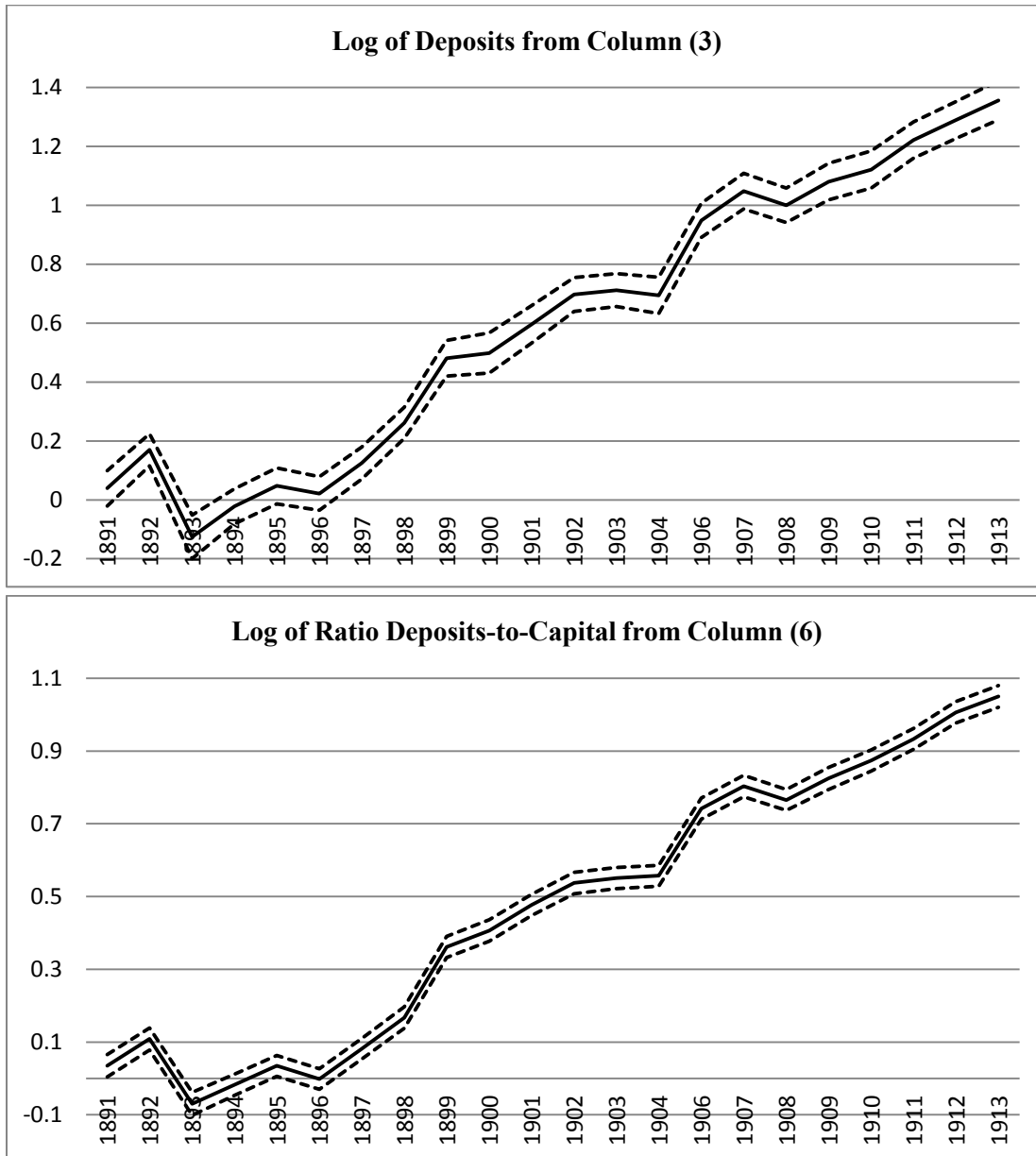
Notes: See Section 2 for bank data sources. Bond prices were obtained from the Comptroller of the Currency's Annual Report. The prices (relative to face value) were averaged from the high and low quotes from the New York City market in November of each year. The underlying bonds included are provided in Footnote 17.

Figure 5: Graph of Time Fixed Effects from Table 1



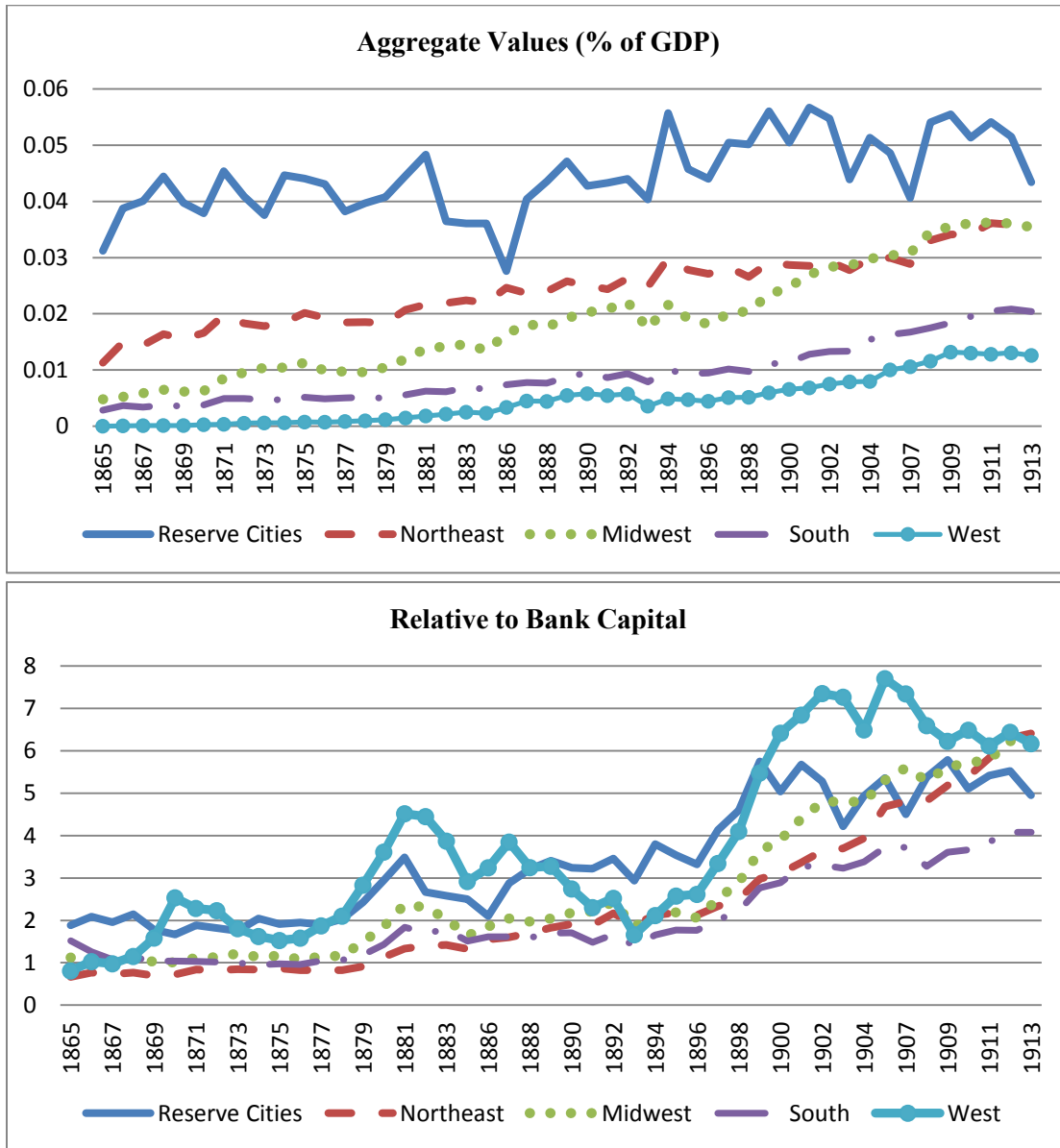
Notes: Figures provide the coefficient and two standard error bands for the year fixed effects in Table 1. The omitted reference year is 1870. The Column number refers to the regression specification. The other specifications yield nearly identical patterns.

Figure 6: Graph of Time Fixed Effects from Table 2



Notes: Figures provide the coefficient and standard error bands for the year fixed effects in Table 2. The omitted reference year is 1890. The Column number refers to the regression specification. The other specifications yield nearly identical patterns.

Figure A1: National Bank Deposits By Region (1865-1913)



Notes: See Section 2 for data sources. Region definitions are described in Appendix B.