

Regulatory Competition, State Banking, and Economic Growth in the National Banking Period

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June 5, 2016

Abstract

The dual banking system created an environment of regulatory competition between state and federal bank regulators that resulted in a number of free banking laws passed at the state level prior to 1900. I provide evidence that the entry of state banks under these laws contributed to the convergence in banking returns observed over this period by decreasing the prevalence of monopoly in banking markets. I also quantify the role of free banking laws in facilitating the expansion of state banking. Finally, I estimate the role of state banks in promoting economic growth in order to quantify the impact of free banking laws on real economic variables. The results indicate that the expansion of state banks, mainly due to the passage of state-level banking laws, significantly increased growth of agricultural output and physical capital prior to 1900.

*I am grateful to Dan Ladley for his assistance in obtaining national bank balance sheet data for this project.

1 Introduction

The National Banking Acts of 1863 and 1864 inadvertently gave birth to the dual banking system in the U.S., under which banks can be chartered by either state authorities or the federal government. The advent of this system gave rise to an environment of strong regulatory competition, as both levels of government strove to raise revenue through issuing bank charters. Although this system encouraged the undercutting of several safety requirements for banks, it also facilitated a huge expansion in banking and an increase in banking competition (White 1982). In this paper, I show that the free banking laws passed by various states in order to issue more bank charters decreased monopoly power and lowered returns in uncompetitive markets. Furthermore, I demonstrate that this expansion of state banking had a significant and positive impact on growth, particularly in the agricultural sector. The results highlight the beneficial nature of regulatory competition in the U.S. banking system.

These findings contribute to the growing empirical literature on the link between financial development and economic growth. Following from the early theoretical contributions of Goldsmith (1969) and McKinnon (1973), cross country studies such as King and Levine (1993) have established a robust link between measures of financial development and growth¹. Looking specifically at the historical period after 1870, Rousseau and Wachtel (1998) find that the level of financial intermediation positively impacted growth for a set of countries including the U.S. However, the evidence for the positive impact of state-chartered banks during this period of U.S. history is less clear. Recent studies of nationally chartered banks (which tended to be larger and more well capitalized than state banks) have generally found that they had positive impacts on growth. Jaremski (2014) finds that the entry of national banks immediately following the National Banking Acts furthered the growth of manufacturing capital and output, particularly in the Midwest. Fulford (2015), exploiting a discontinuity in bank entry from minimum capital requirements, finds that

¹See Levine (2005) for an overview of this literature

gaining a national bank resulted in an increase of county output per capita by around 10%. However, Jaremski and Rousseau (2013) find that banks chartered at the state level under free banking laws prior to the Civil War did not significantly contribute to growth. They conclude that because these banks were smaller and more likely to fail, they were not generally growth-promoting. Thus, it is not clear whether we would expect state banks, chartered under similar free banking laws during the National Banking period, to have significantly promoted growth. This paper provides evidence that they did, in fact, contribute to growth.

The literature on the impact of state banking on competition in the banking system is more clear. Early work by Davis (1965) documents large interregional differences in the rate of return to national banks following the Civil War, which gradually disappeared over the following half-century. This suggests an inefficient and poorly integrated financial system in the early years of the National Banking period, which gradually became more efficient and nationally integrated. Subsequent work by Sylla (1969) argues that this inefficiency was due to the monopolistic nature of banking markets in rural areas. At the time, national banks faced high minimum capital requirements which effectively established a lower bound for the size of a national bank, restricting bank entry into small communities and rural areas. James (1976) specifically highlights the role of state banking laws passed in the 1880s and 1890s in empowering state-chartered banks to compete with national banks and drive down returns. Furthermore, recent work by Sullivan (2009) has reinforced the hypothesis of the uncompetitive nature of the banking system in its early years. However, this work has generally examined the level of banking competition and return differentials at the state level. The first task of this paper is to characterize the impact of state banking on the returns to national banks at a more disaggregated level. To this end, I use the location of all national and state banks decennially from 1870 to 1900 to characterize the competitiveness of banking markets at the level of the city or town. Using the individual balance sheets of national banks, I estimate banking returns at the town level. I use these estimated returns to demonstrate that the expansion of state banking

into these markets was the primary factor in driving down banking returns.

Next, I quantify the role of free banking laws in facilitating the expansion of state banking. Prior to these laws, state banks were generally chartered by special legislative act or through general incorporation laws for all businesses. I quantify the impact of replacing these methods for chartering state banks with general free banking laws. Finally, I link this expansion of state banking to economic growth. To address the issue of simultaneity, I employ the strategy used in King and Levine (1993) and Bodenhorn (2000) and test the impact of initial financial variables on subsequent growth rates. I find that state banking had robust positive impacts on the growth of output and physical capital, particularly in the agricultural sector. The results of these regressions predict that there would have been about 1,400 fewer state banks in 1900 in the absence of state banking laws, and that this would have decreased agricultural output and capital by 1% in 1900. Thus, not only did regulatory competition decrease banking monopoly power, it had a significant impact on real economic activity.

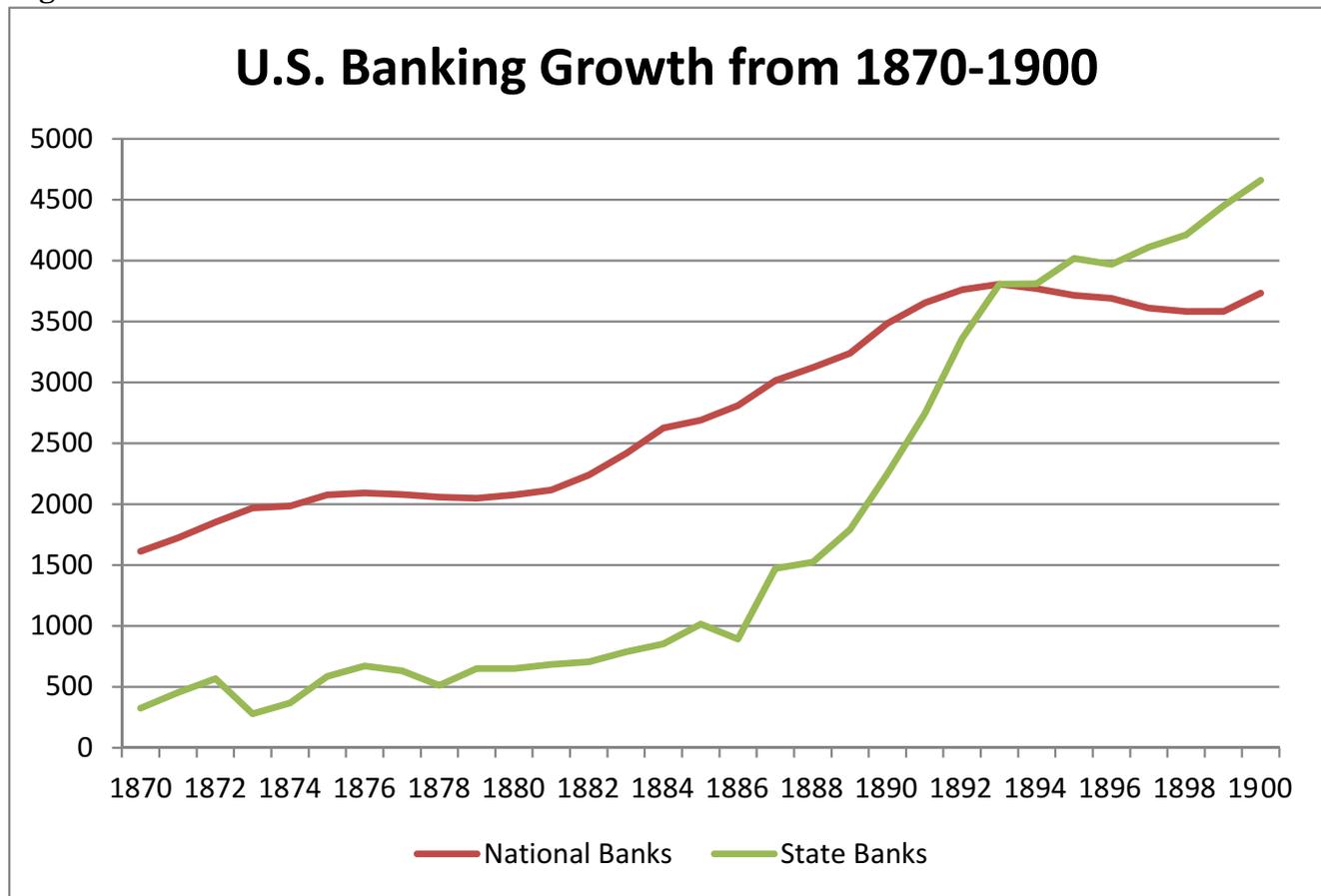
The paper is organized as follows. Section 2 contains historical background on the dual banking system, the growth of state banking, and the free banking laws which enabled it. Section 3 describes the data used, and in particular the method I use for estimating national banking returns at the market level using state level earnings data. Section 4 examines the link between state banking and the returns to national banking at the market level. Section 5 quantifies the impact of free banking laws on the growth of state banking, and section 6 estimates the impact of this expansion on economic growth. Section 7 concludes.

2 Historical Background

Several aspects of the banking system during this period are significant for the analysis of this paper. In particular, the increasing role of state banks in the overall banking system during the 1880s and 1890s is central to my thesis. Prior to the Civil War, the primary

business of banking had been to issue bank notes. Banks took deposits during this period, but the main source of revenue for banks was issuing notes which circulated as currency. The National Bank Acts of 1863 and 1864 created a national system for chartering banks and allowed all such banks to print interchangeable national bank notes. The goal was to create a uniform system of currency, rather than the patchwork of different bank notes of varying reliability that had existed previously. In order to ensure that state bank notes would no longer be used, Congress quickly imposed a 10% tax on the issuance of state bank notes. The result of this tax was the elimination of state bank notes, and nearly the elimination of state banks as well: fewer than 250 state banks existed 1868, compared to 1466 in 1863 (Grossman 2008). However, those state banks which did survive came to rely upon deposit banking as their main source of funds, and this business model coupled with certain competitive advantages over national banks led to a surge in state banking in 1880s and 1890s. By 1900 the number of state-chartered banks exceeded that of national banks. Figure 1 shows a graph of the growth in both types of banks over this period.

Figure 1



Source: U.S. Department of the Treasury. Annual Report of the Comptroller of the Currency (1931), pp. 3, 5.

The competitive advantage enjoyed by state banks originated in the looser restrictions that they faced under state laws, compared to the relatively strict national banking regulations. National banks were prohibited from using real estate as collateral for loans, while most states permitted their banks to do so. The ability to engage in mortgage lending was particularly beneficial for state banks in agricultural areas, where land was the major asset of most potential borrowers. As previously mentioned, national banks also had high minimum capital requirements which prevented them from operating in smaller communities. In nearly every state with a state banking law, the established capital requirement for small towns was below that of national banks. Table 1 shows all of the state banking laws with minimum capital requirements that were less restrictive than the \$50,000

national bank requirement². This list of free banking laws is compiled from information from Knox (1903), Barnett (1911), and various years of the *Rand McNally International Bankers' Directory*.

Table 1: State Banking Laws and Minimum Capital Requirements

State	Year	Capital Requirement
Alabama	1886	50,000 (25,000 paid in)
Colorado	1876	30,000
Florida	1889	15,000
Georgia	1893	25,000
Iowa	1873	25,000
Illinois	1887	25,000
Indiana	1873	25,000
Kansas	1891	5,000
Louisiana	1892	10,000
Michigan	1871	15,000
Minnesota	1878	10,000
Missouri	1879	10,000
Montana	1889	20,000
North Dakota	1889	5,000
Nebraska	<1870	5,000
New Mexico	1888	30,000
New York	<1870	25,000
Ohio	<1870	25,000
Oklahoma	1897	5,000
South Dakota	1891	5,000
Tennessee	1870	0
Utah	1895	25,000
Washington	1889	25,000
Wisconsin	<1870	25,000
West Virginia	1872	25,000
Wyoming	1889	10,000

Sources: Barnett (1911), Knox (1903), Rand McNally International Bankers' Directory, various years.

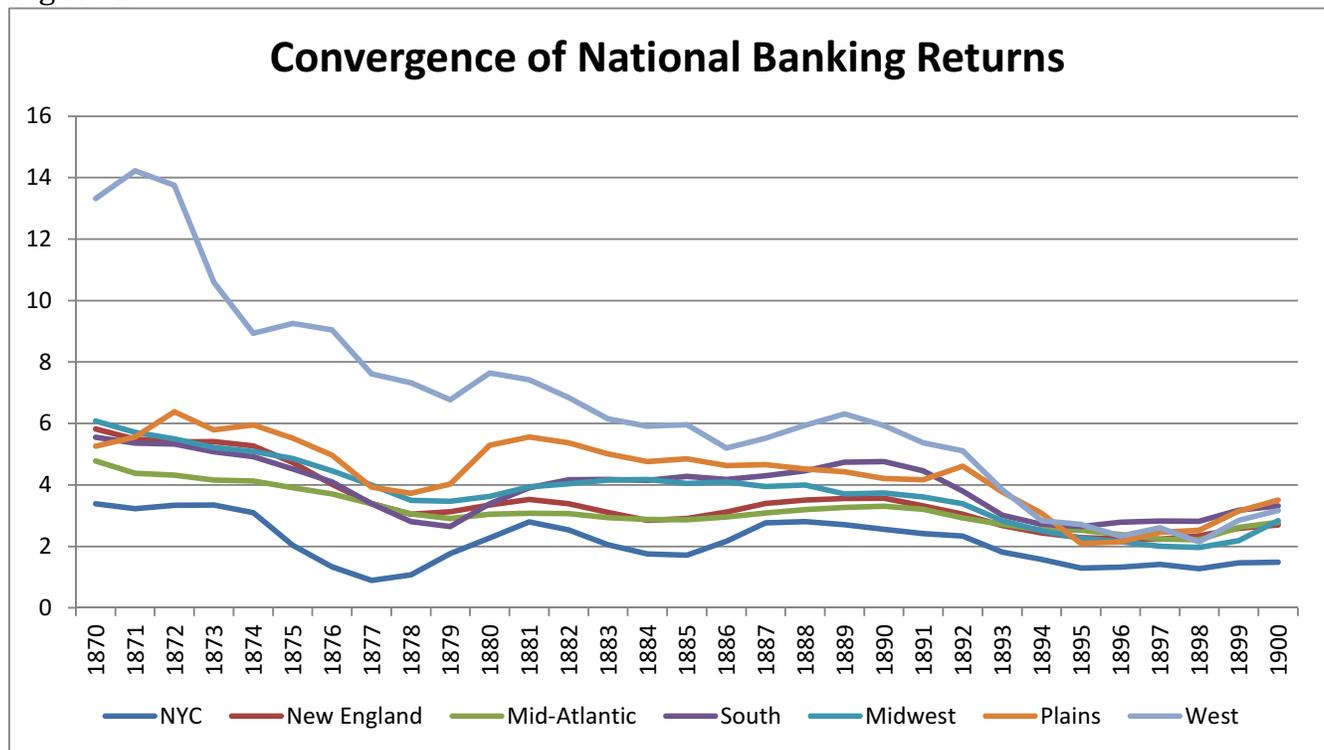
The driving force behind the passage of these laws was regulatory competition between state governments and the national banking system (White 1982). States derived a significant portion of their income from chartering and taxing their own banks, and thus had an incentive to adopt more liberal policies of bank chartering. Eventually, this led

²Minimum capital requirements often varied by the size of the community, with towns with smaller populations being allowed to have smaller banks. Column 3 in table 1 displays the lowest minimum capital allowed in the smallest town.

to the federal government responding in kind with the Gold Standard Act of 1900. This legislation lowered the minimum capital requirement for national banks in the smallest communities from \$50,000 to \$25,000. Several successive rounds of regulatory easing by both levels of government followed over the next several decades.

Over the same period as this resurgence in state banks, regional banking markets became more integrated and a truly national capital market was formed (Davis 1965). Immediately following the Civil War, the rates of return for national banks varied significantly by region, with high returns in the west and relatively low returns in the well-developed eastern financial markets. Although these return differentials persisted for decades, by the end of the decade they had decreased significantly. Figure 2 shows a three-year moving average of the rate of net earnings on earning assets for national banks outside of reserve and central reserve cities. The trend over the period is clearly convergence in the earnings between national banks in different regions, along with a gradual fall in the average net earnings rate.

Figure 2



Source: Davis (1965), Appendix Table 4

James (1976) argued that the increase in state banks noted in figure 1 played a key role in driving this convergence by eliminating monopoly power. In section 4, I provide additional evidence for this by looking at the relationship between monopoly and banking returns at the market level.

3 Data

Data on the location and balance sheet items of national banks comes from the Annual Reports of the Office of the Comptroller of the Currency, decennially from 1870 to 1900. Balance sheet variables for each bank are used to estimate net earnings at the bank level from similar data at the state and reserve city level, as described below. Data on the location and capital of state banks comes from the Merchants and bankers' almanac for 1870 and 1880, and the *Rand McNally International Bankers Directory* for 1890 and 1900. County-level variables, including data on economic growth and control variables used in the analysis, come from Haines (2004). In order to address the issue of changing county borders, counties are merged together if more than 15 square miles shifted from one county to another, using the county borders from NHGIS. This ensures that the units in the 'county-level' analysis are consistent over time. Data on railroad, river, and canal access comes from the GIS databases created by Jeremy Atack (2015). Data on the population of individual cities or towns was collected from the U.S. Census for the years 1870-1900.

Data on the net earnings of national banks also comes from the Comptroller's Annual Reports. Unfortunately, they are only reported at the state or reserve city level in these reports. In order to estimate returns at the bank level, I need to accomplish two things. First, I construct an estimate of the average return to loans at the state or reserve city level using estimates of the return rates on all other earning assets held by national banks (this closely follows James' 1978 calculation of loan returns at the state/reserve city level). I then use these estimated rates of return for different types of earning assets in each state, along with individual bank balance sheet data on the holdings of different earning assets, to

estimate returns at the bank level (and subsequently the market level). In doing so, I make various assumptions about the rates of return for different types of earning assets held by national banks, including government bonds, railroad bonds, and interbank balances.

First, I calculate the average return to loans at the state or reserve city level by subtracting the returns on other earning assets held by banks from total net earnings. The major earning assets of national banks were loans and discounts, bonds for circulation and deposit, other stocks and bonds, and interbank balances. Similarly to James (1978), I calculate the net return on loans for each state or reserve city as

$$r_{LDi} = \frac{NE_i - r_{US}(BC_i + BD_i) - r_{BB}DB_i - r_{RRB}OSB_i}{LD_i}$$

where i indexes states and reserve cities, r_{LDi} is the net return to loans and discounts, NE_i is the net rate of earnings (total net earnings divided by earning assets), BC_i and BD_i are bonds held for circulation and bonds for deposit, DB_i is due from banks, OSB_i is other stocks and bonds (the primary component of which is assumed to be railroad bonds), and LD_i is total loans and discounts. r_{US} is the average interest rate on government bonds, r_{BB} is the average return on bankers' balances, and r_{RRB} is the interest rate on prime railroad bonds³. This gives me an estimate of the net return to loans and discounts for national banks at the state or reserve city level.

In order to approximate returns at the bank level, I use the average return to loans calculated above along with the returns to other earning assets to construct a weighted average of return to earning assets based on each individual bank's balance sheet. The formula for this is as follows:

³The interest rate on government bonds comes from a weighted average of the bonds held as security for circulation. This rate is applied to both bonds held for circulation and bonds held for deposit, as the latter constitutes a significantly smaller portion of the total. The interest rate on prime railroad bonds comes from FRED's series on railroad bond yields, 1857-1934. Following James (1976), I assume the average return on banker's balances during the period from 1888 to 1900 was 2%. James (1978) gives a figure of 3-4% for the early 1870s. Thus, I use a rate 3.5% in 1870, I interpolate these values to get an interbank interest rate of 2.75% for 1880.

$$r_j = \frac{r_{LDi}LD_j + r_{US}(BC_j + BD_j) + r_{BB}DB_j + r_{RRB}OSB_j}{EA_j}$$

where j now indexes individual banks, EA_j is the total earning assets of each bank, and the other variables are as above. This yields an individual return for each bank, based on an average rate of return for each type of earning asset along with the particular composition of earning assets held by each bank. In essence, I am using the composition of each bank's balance sheet along with the estimated return to loans in that bank's state, along with estimates of the return to the other earning assets, to approximate the earnings of that bank. I then aggregate these bank-level returns to the level of the market, in order to approximate returns in different banking markets.

Of course, this is far from a perfect estimate of individual bank returns. Most importantly, it is unable to capture much of the variation in the return to loans between different banking markets within the same state or reserve city. Most of the variation will come from the higher state-level loan returns in states where a higher percentage of national banks operate in a monopolistic environment. However, it is likely that banks in areas with higher loan returns skewed their balance sheets more towards loans, which are the highest return asset on average. This results in higher earnings for those banks relative to others within their state, even assuming the same rate of return on loans. Nevertheless, it is likely that my estimation understates the differences in returns between competitive and uncompetitive markets. If this is true, then my specification in the following section would provide a plausible lower bound on the importance of market structure, rather than an accurate point estimate.

4 State Banking Expansion and Banking Returns

The first task of this paper is to examine the role of state banking in equalizing banking returns across markets. I use the estimates of individual returns obtained above to look at

the impact of monopoly power on banking returns in individual markets. Here, markets are defined as an independent census-enumerated city or town with at least one national bank. Table 2 shows the fraction of banking markets in each year in which only one national bank operated (national bank monopolies) and the fraction in which only one national bank operated and also no state banks were present (full monopolies). In the early years of the national banking period, the majority of banking markets were monopolies. Furthermore, nearly all bank markets which have only one national bank also have no state banks, meaning that almost all national banking monopolies were full monopolies in 1870. However, this situation changed significantly by the end of the century. At that point, only 29% of banking markets had only one national bank, and nearly half of these face competition from state banks. This decline in the prevalence of national banking monopoly coincided with the convergence of banking returns in different regions over this period.

Table 2: Fraction of Banking Markets in Monopoly

Year	National Bank Monopoly	Full Monopoly
1870	.65	.61
1880	.52	.43
1890	.36	.20
1900	.29	.15

The regressions in tables 3 and 4 formally analyze the relationship between monopolistic banking markets and bank returns. Table 3 examines the impact of national bank monopoly and the presence of state banks on earnings with indicator variables. Alternately, table 4 includes measures of the number of national and state banks in each market. Each measure reflects a different view of competition in banking. If banks competed primarily on price, then even a market with relatively few banks could be reasonably competitive, and the indicator variable for a banking monopoly would be the more appropriate measure of market power. However, if banks competed primarily on quantity, then the total number of banks would be more informative. To account for each of these possibilities, I analyze both measures.

The baseline specification is as follows:

$$r_{i,t} = \alpha + \beta_1 \text{MonopolyMeasure}_{i,t} + \beta_2 \text{ReserveCityIndicator}_{i,t} + \beta_3 X_{i,t} + \eta_S + \eta_t + \epsilon_{i,t}$$

where i indexes banking markets and $\text{MonopolyMeasure}_{i,t}$ is either an indicator variable for whether or not the market is a monopoly (in the first set of regressions) or a count variable for the number of banks in the market (in the second set). $\text{ReserveCityIndicator}_{i,t}$ is an indicator variable which takes a value of 1 when the market is a reserve city or a central reserve city and 0 otherwise. Banks in these markets were regulated differently than county banks. Most importantly, they faced different reserve requirements, and this could have impacted banking returns in these markets. Also, the earnings for these markets were reported separately from the states in which they existed in the Comptroller reports, so my estimates of the market-specific earnings will be more accurate for these cities. $X_{i,t}$ contains a number of control variables included in some of the specifications, most importantly the population of the particular city or town. This is included to control for the overall size of the market. The percentage of output from the county that comes from farming (as opposed to manufacturing) and the urbanization rate in the county are also included as factors which may have determined the profitability of national banking activities in these markets. State-level fixed effects are included, as well as time fixed effects. The results are shown in tables 3 and 4 below.

The regressions in table 3 highlight the importance of competition from state banks in driving down banking returns. National bank monopolies do have higher returns in the first specification, but this relationship disappears when more control variables are added. However, when a national bank has a full monopoly, meaning that it also faces no competition from state banks, then the estimated returns are significantly higher for that bank regardless of the specification. These results strongly suggest that the expansion of state banking over this period mitigated the impact of national bank monopolies on returns. In particular, the entry of state banks into markets which otherwise were monopolies for

Table 3: National Bank Earnings and Monopoly in National Bank Cities

	National Bank Earnings			
	(1)	(2)	(3)	(4)
National bank monopoly	0.0350** (2.36)		-0.0176 (-1.01)	
Full monopoly		0.0993*** (6.63)		0.0622*** (3.59)
Reserve city indicator	-0.825*** (-11.56)	-0.808*** (-11.43)	-0.673*** (-8.94)	-0.705*** (-9.35)
ln(City population)			-0.0414*** (-4.36)	-0.0224** (-2.41)
Percent of county output from farming			-0.0933* (-1.72)	-0.0789 (-1.45)
Percent urban in county			-0.116** (-2.00)	-0.120** (-2.07)
State fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Observations	6,409	6,409	6,028	6,028
R-squared	0.815	0.816	0.819	0.819

t statistics in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

the local national bank resulted in significantly lower returns in these markets. Returns are also significantly lower in reserve cities, as might be expected from the competitive nature of these cities. In the final two specifications, a number of other variables that could potentially affect the profitability of national banking are included. Larger markets, as proxied by the city/town population, generally had lower returns, as did markets in urban areas.

Table 4: National Bank Earnings and the Number of Banks in National Bank Cities

	National Bank Earnings					
	(1)	(2)	(3)	(4)	(5)	(6)
ln(State banks)	-0.0247*** (-7.50)		-0.0231*** (-6.85)	-0.0166*** (-4.50)		-0.0166*** (-4.49)
ln(National banks)		-0.0519*** (-3.66)	-0.0297** (-2.05)		0.00603 (0.33)	-0.000387 (-0.02)
Reserve city indicator	-0.741*** (-10.32)	-0.758*** (-10.15)	-0.697*** (-9.30)	-0.667*** (-8.89)	-0.681*** (-8.99)	-0.667*** (-8.82)
ln(City population)				-0.0223** (-2.48)	-0.0388*** (-3.78)	-0.0221** (-2.03)
Percent of county output from farming				-0.0715 (-1.31)	-0.0936* (-1.72)	-0.0715 (-1.31)
Percent urban in county				-0.0999* (-1.72)	-0.118** (-2.04)	-0.1000* (-1.72)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,409	6,409	6,409	6,028	6,028	6,028
R-squared	0.816	0.815	0.816	0.819	0.819	0.819

t statistics in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 4 uses the total number of banks to capture the competitiveness of the market, rather than a simple indicator variable. The results from using this measure are similar to the those in table 3. State banks have a significant negative impact on the net returns to national banking in all specifications. In the first set of regressions, a higher number of na-

tional banks also drive down banking returns, but this impact disappears when controlling for other aspects of the banking market.

These results strongly suggest that the expansion of state banking played a key role in driving down banking returns in high-return areas and thus contributed to the convergence of returns over this period. These findings reinforce previous work by James (1976), who used a state-level analysis to show that state banking expansion was the key factor in making markets more competitive and equalizing returns across regions. He argued that this occurred primarily because of the free banking laws passed by numerous states during this period. In the next section, I quantify the impact of these laws on state banking expansion.

5 State Banking Laws and the Growth of State Banking

The free banking laws documented in Table 1 standardized entry requirements and eased the process of forming a state bank. However, these laws were not the only way for state banks to be chartered during this period. States without a general incorporation law for banks would instead grant charters through individual legislative acts; alternatively, banks might be able to obtain charters through general business incorporation laws (James 1978). The process of obtaining special charters was cumbersome and easily influenced by existing banks wanting to maintain their market power. General business incorporation laws were not geared toward banks specifically and were generally unclear about regulations and restrictions. Thus, the replacement of these methods with state banking laws which specified particular entry requirements and a minimum amount of capital could have facilitated the expansion of state banking. In Table 5, I quantify the role of free banking laws in increasing the number and capital of state banks.

The main specification is as follows:

$$\begin{aligned} \% \Delta StateBanks_{i,t} = & \alpha + \beta_1 FreeBankingLaw_{i,t-1} + \beta_2 StateBanks_{i,t-1} \\ & + \beta_3 NationalBanks_{i,t-1} + \beta_4 X_{i,t-1} + \beta_5 Y_t + \eta_s + \epsilon_{i,t} \end{aligned}$$

where i indexes county merge units, $FreeBankingLaw_{i,t}$ is an indicator variable which takes a value of 1 if the state has a free banking law at time t , $StateBanks$ and $NationalBanks$ control for the (log) initial level of banking, total national output Y_t controls for national economic fluctuations, and $X_{i,t-1}$ contains a number of county-level variables which could influence the rate of growth of state banking. The total population of the county controls for county size. Indicator variables for railroad and river access control for the influence of transportation ⁴. The literacy rate in the county, defined as the percentage of the population able to read, proxies for human capital. Because this variable is unavailable in the census for later years, the value for 1870 is for all observations. Finally, the percentage of the population living in urban areas (defined as towns with a population above 2,500) controls for urbanization. The regressions also include state fixed effects.

One possible concern with this specification is whether or not the passage of a free banking law is in some other way correlated with the potential for state banking. It might have been the case that states with a larger potential for state banking would have been more likely to pass these laws. However, the data does not generally bear this out. For example, the prevalence of agriculture instead of manufacturing is a primary indicator of the competitive advantage of state banking. However, the indicator variable for the presence of a free banking law is not positively correlated with the percentage of county output which comes from farming; the two are in fact weakly negatively correlated (with a correlation coefficient of -.16). Furthermore, the likelihood of a particular state to pass such a law seems to depend on their past legislative history with regards to banking. For example, states which had free banking laws prior to the National Banking period either retained those

⁴Atack, Jaremski, and Rousseau (2014) demonstrate the importance of railroad access in furthering growth in banking

laws or reinstated them early in the period. By contrast, other states were prevented from doing so by the legislative environment (for example, Texas had a constitutional ban on all state banking until 1907). Tennessee established a state banking law with no minimum capital requirement early on, while neighboring (and economically similar) Kentucky never did. Although states had an incentive to issue as many bank charters as possible, the institutional restrictions facing them seem to have been the primary factor in determining whether or not a banking law was passed.

Table 5 shows the results of the above specification, and it indicates that free banking laws did indeed enable state banking to expand at a much more rapid rate than it otherwise would have done. The presence of a free banking law is associated with a nearly 50% higher rate of growth of state banking. The effect on state bank capital is even greater, with a growth rate over 100% higher in the presence of a free banking law. Clearly, the passage of free banking laws facilitated the immense expansion of state banking throughout this period. Although free banking laws do not explain all of the increase in state banking, they account for a significant portion of the expansion. The results of tables 3 and 4 indicate that this expansion of state banking was instrumental in decreasing monopoly returns to national banking, as James (1976) first argued. However, this does not resolve the question of whether or not the passage of these free banking laws actually impacted economic growth. It could have been the case that state banks provided additional competition to national banks but, much like the banks chartered under free banking laws before the Civil War, did not contribute to growth themselves. In the next section, I explore the link between state banking expansion and economic growth.

6 State Banking Expansion and Economic Growth

The main complication in an empirical study of the impact of banking on growth is the potential for growth to impact banking as well. Any empirical analysis must confront the possibility that banks chose to open in places that were already experiencing higher eco-

Table 5: State Banking Laws and the Growth of State Banking

	Dependent Variable: Percent Change in State Banking Variable	
	(1) Number of State Banks	(2) State Bank Capital
State banking law indicator	0.492*** (4.58)	1.235*** (5.34)
ln(State banks)	-0.577*** (-41.63)	
ln(National banks)	0.0252* (1.73)	
ln(State bank capital)		-0.589*** (-43.00)
ln(National bank capital)		0.0192 (1.42)
ln(Population)	0.592*** (16.18)	1.198*** (15.32)
Rail access	0.512*** (6.31)	1.064*** (6.08)
River access	0.0696 (1.12)	0.137 (1.02)
Literacy rate	1.062*** (3.35)	1.970*** (2.88)
Percent urban	0.392*** (3.49)	0.958*** (3.96)
ln(Aggregate output)	1.409*** (11.03)	2.704*** (10.02)
State fixed effects	Yes	Yes
Observations	5,916	5,916
R-squared	0.279	0.280

t statistics in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

economic growth. This would lead a simple analysis to overstate the impact of banking on growth. In order to confront the issue of simultaneity, I take the approach used in King and Levine (1993) and Bodenhorn (2000) of using initial banking variables, rather than contemporaneous measures, to measure the impact on growth. Although this is far from a perfect method, it at least partially addresses the issue of simultaneity by using predetermined financial variables. I am also able to control for a number of independent factors which impact the growth prospects of the county, further reducing simultaneity bias. In the regressions below, I quantify the impact of state banking on output growth and the growth of physical capital. Following that, I use those results along with the results in table 5 to estimate the aggregate impact of regulatory competition via free banking laws on economic growth in this period. I find that free banking laws had a positive and significant impact on agricultural capital and output over this period.

In order to first examine the impact of initial banking variables on subsequent economic growth, I estimate the following pooled OLS regression:

$$\begin{aligned} \% \Delta Y_{i,t} = & \alpha + \beta_1 \text{StateBankingVariable}_{i,t-1} + \beta_2 \text{NationalBankingVariable}_{i,t-1} \\ & + \beta_3 Y_{i,t-1} + \beta_4 X_{i,t-1} + \beta_5 Y_t + \eta_s + \epsilon_{i,t} \end{aligned}$$

where i indexes county merge units. $\text{StateBankingVariable}_{i,t-1}$ and $\text{NationalBankingVariable}_{i,t-1}$ capture either the initial number of banks or the initial amount of banking capital in each county merge unit. $Y_{i,t-1}$ is the initial value of either farming, manufacturing, or total output in the county, and Y_t is the aggregate level of output for each respective variable. This latter variable captures aggregate fluctuations in either farming, manufacturing, or total output in order to account for national macroeconomic trends in output. η_s is a set of state fixed effects, and $\epsilon_{i,t}$ is the error term. $X_{i,t-1}$ contains the same county-level controls as before. Once again, total population controls for the overall size of the county, rail and river access control for transportation opportunities, the literacy rate proxies for human capital,

and the urbanization rate controls for the urban composition of the county. The inclusion of these variables should at least partially account for the underlying growth prospects of the county. Standard errors are clustered at the county level.

Table 6: Pooled OLS: The Impact of Initial Banks on Output Growth, 1870-1900

	Dependent Variable: Percentage Change in Output		
	(1)	(2)	(3)
	Agricultural	Manufacturing	Total
ln(State banks)	0.0179*** (4.66)	0.00005 (0.00)	0.0217*** (3.91)
ln(National banks)	0.0107 (1.43)	0.0563*** (3.21)	0.0327*** (3.48)
ln(Initial value of dependent variable)	-0.665*** (-14.26)	-0.823*** (-36.58)	-0.799*** (-15.86)
ln(Population)	0.440*** (7.44)	0.845*** (13.08)	0.649*** (10.78)
Rail access	0.195*** (6.89)	0.677*** (7.44)	0.195*** (6.45)
River access	-0.0171 (-0.76)	0.205*** (4.21)	0.0681*** (3.06)
Literacy rate	0.107 (0.64)	2.415*** (5.39)	0.414** (2.52)
Percent urban	-0.429** (-1.98)	0.957* (1.84)	0.423 (1.54)
ln(Aggregate output)	1.741*** (12.45)	0.478*** (7.32)	0.304*** (7.80)
State fixed effects	Yes	Yes	Yes
Observations	5,916	5,916	5,916
R-squared	0.580	0.511	0.534

t statistics in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 6 indicates that state banks had a significant impact on agricultural output. Doubling the number of banks increases the rate of growth of agricultural output by nearly 2% over the following decade. National banks are also positively related to agricultural

growth, but the coefficient is not significant. National banks are clearly more important than state banks for manufacturing growth; while national banks are strongly related to manufacturing growth, state banks show no relationship whatsoever. The importance of state banks for agriculture but not for manufacturing makes sense given that one of the primary advantages of state banks was that they were allowed to issue loans using real estate as collateral. As land was relatively more important in agriculture than in manufacturing, this made state banks particularly suited to agricultural lending. The ultimate result of this is that both state and national banks have significant impacts on total output, but the impact of national banks is significantly higher.

The set of county-level control variables generally behave as expected. Larger counties grew more quickly, as did counties with rail access. River access and literacy both seem to matter for manufacturing growth but not farm growth, while more urban counties saw more manufacturing growth but less farm growth. County-level output of all types is higher when national output is higher.

Table 7 uses total banking capital as an alternate measure of the quantity of banking services offered in each county, rather than simply the number of banks. This measure has the advantage of reflecting not only the raw number of banks, but also the average size of each bank as well. All other variables are the same as before.

Once again, state bank capital is important for agricultural growth, while national bank capital is primarily important for manufacturing growth. The coefficients are generally about half as large as those in table 6. This suggests that there might be a separate growth impact to having additional banks, perhaps due to increased competition, which does not come from simply increasing the total amount of banking capital in the area.

Table 8 quantifies the impact of state and national banks on physical capital rather than output. During this period, banks did not generally issue loans in order to fund long-term capital projects. Instead, banks generally adhered to the real bills doctrine, according to which loans should only be issued for short periods of time (a maximum of 6 months), and they should be self-liquidating (meaning that they are issued for a specific economic

Table 7: Pooled OLS: The Impact of Initial Bank Capital on Output Growth, 1870-1900

	Dependent Variable: Percentage Change in Output		
	(1) Agricultural	(2) Manufacturing	(3) Total
ln(State bank capital)	0.00737*** (4.08)	0.00194 (0.39)	0.00992*** (3.96)
ln(National bank capital)	0.00383 (1.19)	0.0240*** (3.17)	0.0131*** (3.21)
ln(Initial level of dependent variable)	-0.666*** (-14.30)	-0.823*** (-36.58)	-0.798*** (-15.78)
ln(Population)	0.446*** (7.57)	0.846*** (13.11)	0.652*** (10.79)
Rail access	0.196*** (6.91)	0.673*** (7.37)	0.192*** (6.31)
River access	-0.0165 (-0.74)	0.204*** (4.20)	0.0689*** (3.09)
Literacy rate	0.114 (0.68)	2.412*** (5.39)	0.421** (2.55)
Percent urban	-0.423** (-1.99)	0.952* (1.84)	0.428 (1.54)
ln(Aggregate output)	1.768*** (12.75)	0.474*** (7.78)	0.321*** (8.79)
State fixed effects	Yes	Yes	Yes
Observations	5,916	5,916	5,916
R-squared	0.579	0.511	0.533

t statistics in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

activity which provides the money to repay the loan upon completion). Under these banking practices, the state and national banks studied here likely only issued loans to fund short-term working capital. Thus, it is not obvious that banking would have a direct impact on capital. However, the short-term loans issued by banks may very well have increased the potential marginal productivity of capital in their local areas, leading to an increase in capital without directly funding it. I investigate this possibility using the following specification:

$$\begin{aligned} \% \Delta K_{i,t} = & \alpha + \beta_1 \text{StateBanks}_{i,t-1} + \beta_2 \text{NationalBanks}_{i,t-1} \\ & + \beta_3 K_{i,t-1} + \beta_4 X_{i,t-1} + \beta_5 Y_t + \eta_s + \epsilon_{i,t} \end{aligned}$$

The three separate regressions separately investigate the impact of banking on agricultural capital, manufacturing capital, and total capital. Manufacturing capital comes directly from the census data in Haines (2004), while farming capital is the sum of the value of farmland, farm buildings, farm equipment, and livestock (buildings are not reported separately from farmland until the 1900 census). County-level and aggregate control variables are as before. Standard errors are clustered at the county level. The results in table 8 are similar to the previous two tables. However, in this case we can definitively say that national banks are important for the growth of agricultural capital as well as manufacturing capital.

The set of results in tables 6-8 establish the positive impact of state banking on economic output, in particular agricultural output. I can use these results to estimate a counterfactual in which there were no free banking laws passed at the state level at this time. This will yield a rough approximation of the positive impact that regulatory competition, in the form of the passage of free banking laws, had on real economic growth. This counterfactual does not capture the full effect of regulatory competition, because even states which did not pass free banking laws began to charter more banks in order to gain market share.

Table 8: Pooled OLS: The Impact of Initial Banks on Capital Growth, 1870-1900

	Dependent Variable: Percentage Change in Physical Capital		
	(1) Agricultural	(2) Manufacturing	(3) Total
ln(State banks)	0.0165*** (4.10)	-0.00241 (-0.21)	0.0267*** (6.65)
ln(National banks)	0.0233*** (3.27)	0.0567*** (3.24)	0.0286*** (5.21)
ln(Initial value of dependent variable)	-0.648*** (-14.00)	-0.787*** (-34.56)	-0.801*** (-16.67)
ln(Population)	0.369*** (6.40)	0.764*** (12.13)	0.584*** (9.97)
Rail access	0.152*** (4.61)	0.688*** (7.62)	0.185*** (5.90)
River access	-0.0151 (-0.66)	0.198*** (4.07)	-0.00771 (-0.39)
Literacy rate	0.717*** (3.39)	2.107*** (4.97)	0.934*** (4.77)
Percent urban	-0.307** (-1.98)	0.925* (1.77)	-0.0306 (-0.49)
ln(Aggregate output)	-0.0807 (-0.66)	0.691*** (10.22)	0.0991*** (3.29)
State fixed effects	Yes	Yes	Yes
Observations	5,916	5,916	5,916
R-squared	0.623	0.480	0.628

t statistics in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

However, it will give some idea of the aggregate impact of the laws themselves.

The first step is estimating the number of state banks which still would have existed, even without free banking laws. I calculate this for each county with the results in table 5, using the coefficient in column 1. In actuality, there were a little over 5,000 state banks in 1900. In a counterfactual where the state banking law indicator always takes a value of 0, the regression predicts about 3,600 total state banks in 1900. With the counterfactual number of state banks in each county, I use the results in tables 6 and 8 to predict a counterfactual amount of agricultural output and capital for each county. The resulting prediction is that, in the absence of any free banking laws, both total agricultural output and total agricultural capital would have been about 1% lower in 1900. While not a huge figure by any means, this nevertheless demonstrates that regulatory competition in the form of state free banking laws had significant and measurable positive impacts on the economy by facilitating the growth of state banking.

7 Conclusion

The evidence indicates that the free banking laws passed during this period had a significant positive impact on output. The high minimum capital requirements established under the National Banking Acts restricted the expansion of national banks into smaller markets, but also created a profit opportunity for states to increase the issuance of their own charters. Furthermore, more than just expanding banking services into smaller markets, these new states banks increased output growth, in particular in the agricultural sector. The dual banking system has long been credited with furthering the establishment of efficient legal rules and regulations in the 20th century (Scott 1977). Here I have demonstrated that from its inception, it has had positive impacts on banking and economic growth.

This study is limited to examining regulatory competition as embodied in state banking laws passed from 1870-1900. However, this was only the first form of regulatory competition under the dual system. In order to compete with the expanding state banks, in 1900

the federal government passed the Gold Standard Act to decrease the minimum capital requirements of national banks from \$50,000 to \$25,000 in small towns. As Sylla (1969) shows, the number of national banks nearly doubled in the decade following this new law, and nearly two-thirds of these new banks had a capital stock that was less than the previous \$50,000 threshold. In response, nearly every state which had a minimum capital requirement above the new \$25,000 limit reduced them in order to remain competitive (White 1982). With the establishment of the Federal Reserve in 1913 reserve requirements were relaxed further, along with and restrictions on real estate lending, in order to entice banks to join the new system. By 1915, fifteen states had reduced their own reserve requirements in response.

In short, the pattern of competition between state and federal banking regulators extends significantly beyond the present study. Certainly, this progressive relaxation of restrictions likely had negative effects on the stability of the banking system, demonstrated in the banking troubles of the Great Depression. Yet it should not be forgotten that facilitating the expansion of the financial system has positive results for the provision of banking services and for economic growth itself.

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