

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

Christopher Cotter*

Abstract

The dual banking system created an environment of regulatory competition between state and federal bank regulators that led to the passage of free banking laws in a number of states prior to 1900, allowing state-chartered banks to open in areas underserved by federally-chartered banks. This paper demonstrates the role that this expansion of state-chartered banking played in promoting economic growth. I use both an initial banking variables approach and an instrumental variables approach to identify the impact of state banking growth on county-level output and capital. The results indicate that state banks significantly contributed to output and capital growth in the agricultural sector, while the impact of national banks is concentrated primarily in the manufacturing sector. These findings suggest that state free banking laws, encouraged by regulatory competition, significantly increased the growth of agricultural output and capital during this period.

Keywords: Finance-growth nexus, regulatory competition, U.S. banking, state-chartered banking, free banking

JEL Classifications: G21, G28, N11, N21

*Contact: chris.cotter@oberlin.edu. I am grateful to Peter Rousseau, Jeremy Atack, David Parsley, Hugh Rockoff, and seminar participants at the Southern Economic Association annual meeting for comments on this paper, and I would like to thank Dan Ladley for his assistance in obtaining the national bank balance sheet data used in 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 could be chartered either by state authorities or the federal government. The advent of this system created an environment of vigorous regulatory competition, as both levels of government strove to expand the portion of the banking system under their regulatory authority. 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 did, in fact, result in an increase in bank charters. Furthermore, I demonstrate that this expansion of state banking had a significant and positive impact on output and capital growth, particularly in the agricultural sector. Although nationally-chartered banks were well suited to provide financing to the manufacturing sector concentrated in urban areas, restrictions on collateral and minimum size limited their role in agricultural lending. The results highlight the beneficial nature of regulatory competition in the U.S. banking system and the unique role that state-chartered banks played in serving the needs of the agricultural sector during this period.

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 growth.¹ 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

¹See Levine (2005) for an overview of the general finance-growth literature, and Bodenhorn (2018) for a survey of finance and growth in the context of U.S. history.

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 gaining a national bank resulted in an increase of county output per capita by around 10%. Carlson, Correia, and Luck (2019) similarly find that a higher level of banking competition among national banks due to lower entry requirements promotes credit expansion and leads to higher levels of manufacturing activity. However, in examining state-chartered banks Jaremski and Rousseau (2013) find, in the period prior to the Civil War, state banks chartered under free banking laws 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, and that they were particularly important for agriculture.

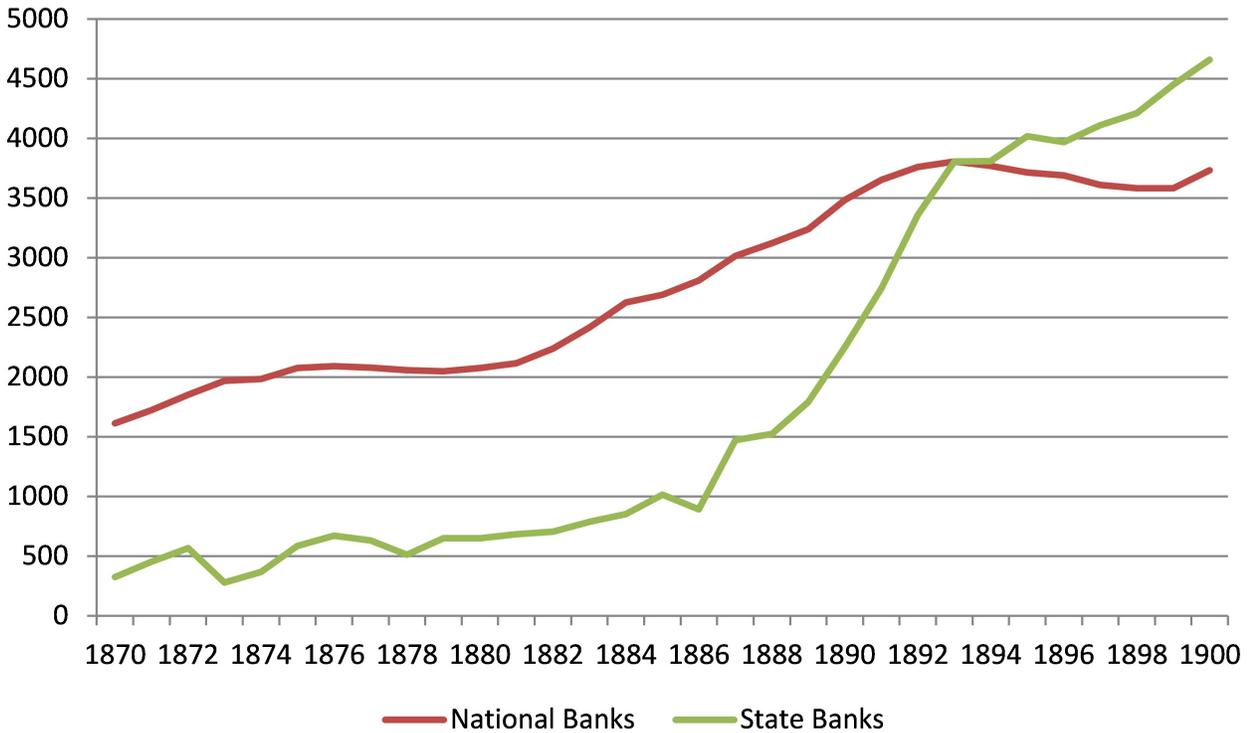
In this paper, I first quantify the role of free banking laws in facilitating the expansion of state banking. Prior to these laws, state banks were generally chartered by special legislative act or through general incorporation laws for all businesses. The specification in defined in equation 1 measures the impact of replacing these methods for chartering state banks with general free banking laws. Next, I link this expansion of state banking to economic growth. To address the issue of simultaneity, I employ two separate identification strategies. First, I follow King and Levine (1993) and Bodenhorn (2000) by testing the impact of initial financial variables on subsequent growth rates. Second, I use the presence or absence of a free banking law to instrument for growth in state banking variables. The results from both approaches demonstrate that state banking had robust positive impacts on the growth of output and physical capital, particularly in the agricultural sector. The magnitude of the coefficients implies 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, the regulatory competition that gave

rise to free banking laws in this period drove significant growth in agriculture, suggesting that the balance between manufacturing and agriculture in the U.S. economy might have been significantly different in its absence.

2 Historical Background and Data

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. 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 that 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: U.S. Banking Growth from 1870-1900



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 requirement.²

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

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 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.

Data on the location and balance sheet items of national banks comes from the decennial Reports of the Office of the Comptroller of the Currency from 1870 to 1900. 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). 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).

3 State Banking Laws and the Growth of State Banking

The first task is to estimate the impact of state banking laws on the expansion of state banking during this period. 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

allowed in the smallest town.

legislative acts; alternatively, banks might be able to obtain charters through general business incorporation laws (James 1978). Although both of these paths allowed the formation of banks, they were likely more difficult than under a general state banking law. The process of obtaining special charters was cumbersome and easily influenced by existing banks wanting to maintain their market power. General business incorporation laws, meanwhile, 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 2, I quantify the role of free banking laws in increasing the number and capital of state banks.

The main specification is as follows:

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

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.³ 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.

³Atack, Jaremski, and Rousseau (2014) demonstrate the importance of railroad access in furthering growth in banking.

One possible concern with this specification is the potential that the passage of a free banking law might be correlated with the potential for state banking in some other way. For example, it might have been the case that states with a larger potential for state banking would have been more likely to pass these laws. If this were true, it would preclude the use of free banking laws as an instrument in the subsequent regressions. However, the data provides reasons to doubt this possibility. For example, the prevalence of agriculture instead of manufacturing is perhaps the primary indicator of the competitive advantage of state banking. Yet 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 -0.16). 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 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. Thus, the passage of free banking laws might plausibly be taken as exogenous to the state's potential for state banking expansion.

Table 2 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 (These results also serve as the first stage regression for subsequent instrumen-

Table 2: State Banking Laws and the Growth of State Banking

	(1)	(2)
	Percent Change in Number of State Banks	Percent Change in State Bank Capital
State banking law indicator	0.49*** (4.58)	1.24*** (5.34)
ln(State banks)	-0.58*** (-41.63)	
ln(National banks)	0.025* (1.73)	
ln(State bank capital)		-0.59*** (-43.00)
ln(National bank capital)		0.019 (1.42)
ln(Population)	0.59*** (16.18)	1.20*** (15.32)
Rail access	0.51*** (6.31)	1.06*** (6.08)
River access	0.070 (1.12)	0.14 (1.02)
Literacy rate	1.06*** (3.35)	1.97*** (2.88)
Percent urban	0.39*** (3.49)	0.96*** (3.96)
ln(Aggregate output)	1.41*** (11.03)	2.70*** (10.02)
State fixed effects	Yes	Yes
Observations	5,916	5,916
R-squared	0.28	0.28

t statistics in parentheses

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

tal variable regressions in tables 5 and 6). Although free banking laws do not explain all of the increase in state banking, they account for a significant portion of the expansion. However, the ultimate question concerns 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 (Jaremski and Rousseau 2013). The next section explores the link between state banking expansion and economic growth.

4 State Banking Expansion and Economic Growth

Identification using the Initial Variables Approach

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 economic growth. This would lead a simple analysis to overstate the impact of banking on growth. In this paper, I utilize two strategies to address this issue. In this subsection, 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 subsequent growth. Although this is far from a perfect method, it at least partially addresses the issue of simultaneity by using predetermined financial variables. The specification used here (shown in equation 2) also controls for a number of independent factors which influence the growth prospects of a county, further reducing simultaneity bias. In the next subsection, I instead instrument for the state banking variables using the state banking law indicator variable used in table 2 above.

In the initial banking variables specification, I estimate the following pooled OLS regression:

$$\begin{aligned} \% \Delta Y_{i,t} = & \alpha + \beta_1 \text{StateBankingVariable}_{i,t-1} + \beta_2 \text{NationalBankingVariable}_{i,t-1} \quad (2) \\ & + \beta_3 Y_{i,t-1} + \beta_4 X_{i,t-1} + \beta_5 Y_t + \eta_s + \epsilon_{i,t} \end{aligned}$$

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 or manufacturing 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 or manufacturing output 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. The results are shown in table 3 below. Standard errors are clustered at the county level.

The results indicate 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 results are similar when the amount of banking is measured by total bank capi-

Table 3: The Impact of Banks on Output Growth (Pooled OLS)

	(1)	(2)	(3)	(4)
	Agricultural Output	Manufacturing Output	Agricultural Output	Manufacturing Output
ln(State banks)	0.018*** (4.66)	0.00005 (0.00)		
ln(National banks)	0.011 (1.43)	0.056*** (3.21)		
ln(State bank capital)			0.007*** (4.08)	0.002 (0.39)
ln(National bank capital)			0.004 (1.19)	0.024*** (3.17)
ln(Initial level of dependent variable)	-0.67*** (-14.26)	-0.82*** (-36.58)	-0.67*** (-14.30)	-0.82*** (-36.58)
ln(Population)	0.44*** (7.44)	0.85*** (13.08)	0.45*** (7.57)	0.85*** (13.11)
Rail access	0.20*** (6.89)	0.68*** (7.44)	0.20*** (6.91)	0.67*** (7.37)
River access	-0.017 (-0.76)	0.21*** (4.21)	-0.017 (-0.74)	0.20*** (4.20)
Literacy rate	0.11 (0.64)	2.42*** (5.39)	0.11 (0.68)	2.41*** (5.39)
Percent urban	-0.43** (-1.98)	0.96* (1.84)	-0.42** (-1.99)	0.95* (1.84)
ln(Aggregate output)	1.74*** (12.45)	0.48*** (7.32)	1.77*** (12.75)	0.47*** (7.78)
State Fixed Effects	Yes	Yes	Yes	Yes
Observations	5,916	5,916	5,916	5,916
R-squared	0.58	0.51	0.58	0.51

t statistics in parentheses

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

tal rather than the number of banks (a measure which reflects not only the raw number of banks but also the average size of banks). The coefficients are generally about half as large as those in table 3. 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. 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 4 quantifies the impact of state and national banks on physical capital rather than output. During this period, banks did not generally issue loans 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 six months), and they should be self-liquidating (meaning that they are issued for a specific economic 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. The following specification investigates the relationship between banks and physical capital:

$$\begin{aligned} \% \Delta K_{i,t} = & \alpha + \beta_1 \text{StateBankingVariable}_{i,t-1} + \beta_2 \text{NationalBankingVariable}_{i,t-1} \quad (3) \\ & + \beta_3 K_{i,t-1} + \beta_4 X_{i,t-1} + \beta_5 Y_t + \eta_s + \epsilon_{i,t} \end{aligned}$$

The regressions separately investigate the impact of banking (measured both by the number and total capital of banks) on agricultural and manufacturing capital. Manufac-

turing 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 for physical capital are largely similar to those for output, but here the results definitively indicate that national banks are important for the growth of agricultural capital as well as manufacturing capital. The impact of state banks is still confined to the agricultural sector. Together, the results in tables 3 and 4 establish the positive relationship between state banks and economic activity, in particular agricultural activity. The regression estimates have implications for the aggregate impact of regulatory competition, in the form of the passage of free banking laws, on real economic growth. In a counterfactual situation in which no free banking laws were passed, the magnitudes from table 2 imply that, rather than the roughly 5,000 state banks which existed in 1900, the U.S. would have had only 3,600 state banks. Taking the coefficients in tables 3 and 4 at face value, this implies values for total agricultural output and agricultural capital that are 1% lower than their actual 1900 levels. Thus, in a counterfactual situation without free banking laws, agricultural economic activity would have been significantly lower than it actually was. These results suggest 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.

Identification using the Instrumental Variable Approach

Although the results in the previous subsection consistently demonstrate the relationship between the expansion of state banks and the growth of agricultural activity, we might be concerned that the initial variables approach does not adequately address concerns about endogeneity. An alternate approach to the endogeneity issue is to use the passage of free banking laws as an instrument for the number of state banks or amount of state banking

Table 4: The Impact of Banks on Capital Growth (Pooled OLS)

	(1)	(2)	(3)	(4)
	Agricultural Capital	Manufacturing Capital	Agricultural Capital	Manufacturing Capital
ln(State banks)	0.017*** (4.10)	-0.002 (-0.21)		
ln(National banks)	0.023*** (3.27)	0.057*** (3.24)		
ln(State bank capital)			0.008*** (3.91)	0.0004 (0.07)
ln(National bank capital)			0.009*** (3.05)	0.024*** (3.20)
ln(Initial value of dependent variable)	-0.65*** (-14.00)	-0.79*** (-34.56)	-0.65*** (-13.98)	-0.79*** (-34.58)
ln(Population)	0.37*** (6.40)	0.76*** (12.13)	0.37*** (6.47)	0.77*** (12.18)
Rail access	0.15*** (4.61)	0.69*** (7.62)	0.15*** (4.59)	0.68*** (7.56)
River access	-0.015 (-0.66)	0.20*** (4.07)	-0.015 (-0.65)	0.20*** (4.06)
Literacy rate	0.72*** (3.39)	2.11*** (4.97)	0.72*** (3.41)	2.11*** (4.97)
Percent urban	-0.31** (-1.98)	0.93* (1.77)	-0.30** (-1.97)	0.92* (1.77)
ln(Aggregate output)	-0.081 (-0.66)	0.69*** (10.22)	-0.061 (-0.50)	0.69*** (10.89)
State Fixed Effects	Yes	Yes	Yes	Yes
Observations	5,916	5,916	5,916	5,916
R-squared	0.62	0.48	0.62	0.48

t statistics in parentheses

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

capital in the above regressions. The results in table 2 demonstrate the strong first-stage relationship between free banking laws and the growth of state banks. The primary concern with this approach would be the possibility that the existence of a free banking law was positively correlated with agricultural output or capital in some way other than through the growth of state banks. However, I have argued in section 3 that the primary determinant of state banking laws was the past legislative history of the state, and indeed the correlation between the existence of a banking law and the fraction of output due to agriculture is actually weakly negative. In the following analysis I use the identification assumption that the existence of a free banking law is plausibly unrelated to agricultural output and capital other than through state bank growth. Table 5 below displays the results from implementing this instrumental variable approach in estimating the regressions in equation 2.

The results of this IV strategy are consistent with those of the initial values strategy in section 4. Both the number of state banks and the amount of state banking capital are significantly and positively associated with agricultural output, with the coefficient stronger for the number of banks. The F-statistics for the agricultural regressions strongly indicate the significance of the instrument in these regressions. In the manufacturing regressions, the insignificant coefficients and the low F-statistic reflect the lack of a relationship between the state banking variables and the manufacturing variables. As above, state banks contribute significantly to agricultural output but not to manufacturing output. The specification in table 6 utilizes this same instrumental variable strategy to examine the impact of state banks on physical capital, as captured in equation 3 above.

Once again, state banks, measured both by number of banks and total banking capital, have a significant impact on the growth of agricultural capital, with a stronger effect from an increase in the number of banks rather than a simple increase in capital. The F-statistics strongly indicate the significance of the instrument used in the IV strategy. State banks again have no relationship with manufacturing capital, as reflected both in the insignificant coefficients and the low F-statistics for those regressions. The results from both

Table 5: The Impact of Banks on Output Growth (2SLS)

	(1)	(2)	(3)	(4)
	Agricultural Output	Manufacturing Output	Agricultural Output	Manufacturing Output
ln(State banks)	0.073*** (3.08)	-13.10 (-0.18)		
ln(State bank capital)			0.037*** (3.12)	-1.17 (-0.93)
ln(National banks)	0.0005 (0.05)	1.66 (0.19)		
ln(National bank capital)			-0.0009 (-0.20)	0.16 (1.06)
ln(Initial level of dependent variable)	-0.65*** (-13.18)	-0.85*** (-4.42)	-0.65*** (-13.15)	-0.83*** (-24.13)
ln(Population)	0.39*** (5.71)	7.84 (0.21)	0.39*** (5.63)	2.19 (1.51)
Rail access	0.18*** (6.02)	0.22 (0.08)	0.17*** (5.89)	0.72*** (3.52)
River access	-0.021 (-0.93)	2.65 (0.20)	-0.021 (-0.92)	0.63 (1.26)
Literacy rate	0.060 (0.36)	16.08 (0.22)	0.067 (0.39)	4.72* (1.81)
Percent urban	-0.47** (-1.99)	13.70 (0.20)	-0.47** (-1.99)	3.32 (1.09)
ln(Aggregate output)	1.47*** (6.84)	32.58 (0.19)	1.47*** (6.83)	5.86 (1.01)
State Fixed Effects	Yes	Yes	Yes	Yes
Observations	5,916	5,916	5,916	5,916
F-stat	170.1	0.033	152.9	0.93

t statistics in parentheses

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

Table 6: The Impact of Banks on Capital Growth (2SLS)

	(1)	(2)	(3)	(4)
	Agricultural Capital	Manufacturing Capital	Agricultural Capital	Manufacturing Capital
ln(State banks)	0.051** (2.14)	-7.37 (-0.18)		
ln(State bank capital)			0.026** (2.20)	-0.65 (-0.84)
ln(National banks)	0.017* (1.84)	0.96 (0.19)		
ln(National bank capital)			0.006 (1.63)	0.097 (1.08)
ln(Initial value of dependent variable)	-0.65*** (-14.07)	-0.77*** (-6.44)	-0.65*** (-14.06)	-0.79*** (-29.37)
ln(Population)	0.35*** (6.08)	4.65 (0.22)	0.35*** (6.07)	1.50* (1.72)
Rail access	0.14*** (4.25)	0.41 (0.25)	0.14*** (4.16)	0.71*** (5.15)
River access	-0.018 (-0.76)	1.57 (0.21)	-0.018 (-0.76)	0.44 (1.42)
Literacy rate	0.69*** (3.28)	9.707 (0.23)	0.70*** (3.30)	3.37** (2.10)
Percent urban	-0.34* (-1.96)	8.07 (0.20)	-0.34* (-1.95)	2.24 (1.16)
ln(Aggregate output)	-0.241 (-1.33)	18.76 (0.19)	-0.236 (-1.30)	3.692 (1.04)
State Fixed Effects	Yes	Yes	Yes	Yes
Observations	5,916	5,916	5,916	5,916
F-stat	184.9	0.033	166.0	0.93

t statistics in parentheses

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

identification strategies consistent demonstrate that while state banks were an important contributor to the growth in agricultural activity, they did not promote growth in manufacturing activity.

5 Conclusion

The high minimum capital requirements established under the National Banking Acts restricted the expansion of national banks into smaller markets, creating a profit opportunity for states to increase the issuance of their own charters. The free banking laws passed in response facilitated a dramatic increase in the number of state-chartered banks in these smaller markets, driving significant increases in agricultural capital and output. The dual banking system has long been credited with furthering the establishment of efficient legal rules and regulations in the 20th century (Scott 1977). The results here indicate that from its inception, it has had positive impacts on banking and agricultural 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. To compete with the expanding state banks, in 1900 the federal government passed the Gold Standard Act that decreased 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, 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.

References

- [1] Atack, Jeremy. (August 2015) “Historical Geographic Information Systems (GIS) database of U.S. Railroads for 1868-1903”
- [2] Atack, Jeremy. (August 2015) “Historical Geographic Information Systems (GIS) database of Steamboat-Navigated Rivers During the Nineteenth Century in the United States.”
- [3] Atack, Jeremy. (August 2015), “Historical Geographic Information Systems (GIS) database of Nineteenth Century U.S. Canals.”
- [4] Atack, J., Jaremski, M., & Rousseau, P. L. (2014). American banking and the transportation revolution before the civil war. *The Journal of Economic History*, 74(04), 943-986.
- [5] Barnett, G. E. (1911). *State banks and trust companies since the passage of the National-bank act*. US Government Printing Office.
- [6] Bodenhorn, H. (2000). *A history of banking in Antebellum America: financial markets and economic development in an Era of Nation-Building*. Cambridge University Press.
- [7] Bodenhorn, H. (2018). Two centuries of finance and growth in the United States, 1790–1980. In *Handbook of Finance and Development*. Edward Elgar Publishing.

- [8] Carlson, M. A., Correia, S., & Luck, S. (2019). The effects of banking competition on growth and financial stability: Evidence from the national banking era. Available at SSRN 3202489.
- [9] Fulford, S. L. (2015). How Important Are Banks for Development? National Banks in the United States, 1870–1900. *Review of Economics and Statistics*, 97(5), 921-938.
- [10] Goldsmith, R.W. (1969). *Financial Structure and Development*. Yale University Press, New Haven, CT.
- [11] Haines, Michael R. (2004) Historical, Demographic, Economic, and Social Data: The United States, 1790-2000. ICPSR Study 2896. Ann Arbor, MI: Inter-university Consortium for Political and Social Research
- [12] James, J. A. (1978). *Money and capital markets in postbellum America*. Princeton University Press.
- [13] Jaremski, M. (2014). National Banking's Role in US Industrialization, 1850–1900. *The Journal of Economic History*, 74(01), 109-140.
- [14] Jaremski, M., & Rousseau, P. L. (2013). Banks, free banks, and US economic growth. *Economic Inquiry*, 51(2), 1603-1621.
- [15] King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The quarterly journal of economics*, 717-737.
- [16] Knox, J. J. (1903). *A history of banking in the United States*. B. Rhodes & Co..
- [17] McKinnon, R.I. (1973). *Money and Capital in Economic Development*. Brookings Institution, Washington, DC.
- [18] Rousseau, P. L., & Wachtel, P. (1998). Financial intermediation and economic performance: historical evidence from five industrialized countries. *Journal of money, credit and banking*, 657-678.

- [19] Scott, K. E. (1977). The dual banking system: A model of competition in regulation. *Stanford Law Review*, 1-50.
- [20] Sylla, R. (1969). Federal policy, banking market structure, and capital mobilization in the United States, 1863–1913. *The Journal of Economic History*, 29(04), 657-686.
- [21] US Comptroller of the Currency, *Annual Report*, various years. US Government Printing Office.
- [22] White, E. N. (1982). The political economy of banking regulation, 1864–1933. *The Journal of Economic History*, 42(01), 33-40.