ANTEBELLUM BANKING REGULATION:
A COMPARATIVE APPROACH

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By

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ABSTRACT

Extensive historical and contemporary studies establish important links between financial systems and economic development. Despite the importance of this research area and the extent of prior efforts, numerous interesting questions remain about the consequences of alternative regulatory regimes for the health of the financial sector. As a dynamic period of economic and financial evolution, which was accompanied by diverse banking regulations across states, the antebellum era provides a valuable laboratory for study. This dissertation utilizes a rich data set of balance sheets from antebellum banks in four U.S. states, Massachusetts, Ohio, Louisiana and Tennessee, to examine the relative impacts of preventative banking regulation on bank performance. Conceptual models of financial regulation are used to identify the motivations behind each state's regulation and how it changed over time. Next, a duration model is employed to model the odds of bank failure and to determine the impact that regulation had on the ability of a bank to remain in operation. Finally, the estimates from the duration model are used to perform a counterfactual that assesses the impact on the odds of bank failure when imposing one state's regulation on another state, ceteris paribus. The results indicate that states did enact regulation that was superior to alternate contemporaneous banking regulation, with respect to the ability to maintain the banking system. This is especially evident in Tennessee where the counterfactual indicates that the odds of bank failure would have

increased from 6.3% to 67.3% under Ohio regulation. The results are even more striking when the counterfactual is performed by subintervals of the antebellum period. During the turbulent subperiod of 1856-1860, the estimated odds of a Tennessee bank failing are 13%. However, this would have increased to 83.6% had Tennessee been under Ohio law. Although some results indicate that alternative laws would have lowered the odds of failure, the greatest decreases in the odds occur during subperiods when the states' banking systems were the most unstable. However, inappropriate regulation may have caused the instability. Whichever the case, this research suggests that there is not a universally optimal solution to banking regulation.

To my Mom and Dad
for their support, generosity,
guidance and love.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

The credit crunches of the 1960s, the high inflation rates of the 1970s, the Savings and Loan failures of the 1980s and, more recently, the East Asian crisis in 1997 and Argentina's financial crisis of the past two years are reminders of the importance of enacting proper financial regulation. Regulation failed to prevent these problems and, instead, may have worsened the effects of these shocks. Many economists have drawn upon U.S. historical experience to examine the impact of regulatory changes on the operations of financial institutions to assess the problems with financial regulation and the impacts of potential alternatives. Calomiris (2000) offers an excellent survey of this work.

This dissertation looks to the antebellum period in the United States to assess how well bank regulators served their constituents, relative to how alternative regulators would have done. This is accomplished by (1) examining the political economy of banking regulation to provide an understanding of the environment in which the banks were operating, and (2) estimating a discrete-time duration model of bank failures that enables the construction of a counterfactual, which posits the question of whether the state regulators were able to support their banking systems better than their counterparts

in other states. Other authors have modeled the causes of bank failures in historical periods (Mitchener 2002, Rolnick and Weber 1984, Wheelock and Wilson 1995, among others). This is not the explicit aim of this dissertation. Rather, this study considers the impact of local regulators and whether they can provide better regulation than foreign, or external, ones. The results can have implications on the relative performance of local regulation versus the one-size-fits-all regulation imposed, to some degree, since the National Banking Act.

The antebellum period in the United States (1830-1860) is particularly interesting for learning how banking regulation impacts bank performance. In response to the burgeoning number of banks throughout the U.S., most states actively debated the banking issue and enacted several banking regulations, including the free banking law, more frequently in this period relative to earlier ones. During this period, individual state legislatures controlled banking regulation; therefore, each state possessed the political potential to follow a different regulatory path. Furthermore, there were several instances of national financial distress (two panics, 1837 and 1857, and a recession in the early 1840s[1]), which tested the banking systems. The period provides regulatory diversity as well as macroeconomic shocks, which create a natural experiment to study the differences in the efficacy of banking regulations.

An additional focus of this research is the success of banking in the South. In much of the literature dealing with this period, Southern states have been overlooked because they, supposedly, lacked effective banking systems. Given the vital role that the

[1] A recent article by Ó Gráda and White (2003) details the controversy over when panics in the 19th century actually occurred. The two mentioned in the present study, in 1837 and 1857, are a subset of most authors' beliefs. That there was a panic in 1839 is also widely believed but here is treated as part of the aftermath of the Panic of 1837.

South played in the economic development of the United States, this is a grave oversight in the literature. Indeed, the Southern states may have had more sophisticated banking in some respects than contemporaneous Northern states (Calomiris and Schweikart 1991, Schweikart 1987). The failure to recognize potential Southern contributions may be the reason that Southern banking "technology" was ignored and, therefore, lost after the Civil War, especially with regard to branch banking.

In chapter 2, several possible motivations for banking regulation are defined. These include the leviathan, institutions, ideology, public interest and private interest approaches to regulation. As will become clear when these ideas are applied to the actual laws that transpired during the period, they are not necessarily distinct from one another. Additionally, the intent behind legislation may not coincide with its actual outcome. This makes understanding the motives of the legislators all the more challenging.

These approaches to banking regulation are then used to study the political economies of banking regulation for each of the four states under study, Massachusetts, Ohio, Louisiana and Tennessee. These states include both northern and southern ones. Within these regions, they provide diversity in types of banking systems, economies and regulatory regimes.

Massachusetts is distinguished from the other three states not only by the size of its manufacturing sector but also by the size of its banking sector. Indeed, Massachusetts had established 208 banks over the 1830-1860 period. Massachusetts legislators during the antebellum period seemed to be trying to find a balance between too much government intervention and not enough. They were successful during much of the period as evidenced by the low incidence of bank failures they experienced.

Ohio's economy was almost entirely agricultural at the beginning of the antebellum period. Though its production may have increased in its manufacturing sector during the period, it was still a primarily agricultural state in the North. Early in the period, the legislators were ostensibly concerned with protecting the public, but the outcome was much to the detriment of the state's banking system. There was a distinct break in the treatment of banks in 1845 when Ohio's banking system was completely altered. The legislature established of a state banking system that better promoted the sustainability of banks while still protecting the public through a safety fund.

Most southern states economies were primarily agricultural. Louisiana, in addition to farming, was also a large center of commerce because of its geographic location. This underlies the fact that, although Louisiana had the fewest banks during the period, it was the only state to have more large banks than small.[2] Louisiana experienced a decisive switch between Whig and Democratic rule in 1843, which resulted in a new state constitution that created a more hostile environment for banks. Hence, it was the only state of the four to have had fewer banks in 1860 than in 1840.

Tennessee's income also came from agricultural produce and less so from commerce. The Tennessee regulators were very protective of their banking system and tightly controlled it for most of the period. The legislature heavily sponsored the establishment of the state's only large banks. These three banks were the strongest of the system, lasting from their founding through 1860. When the legislators eased their control over bank entry, the number of banks rapidly increased. This resulted in heavy losses from the Panic of 1857, which prompted the legislatures to tighten some

[2] The terminology of "small" and "large" banks in this paper distinguishes between banks with less than $1 million in capital and $1 million or more in capital, respectively.

restrictions once again. These states' experiences illustrate the diversity of economic, regulatory and banking types that existed in the United States during this period both between North and South as well as within each region.[3]

In chapter 3, a discrete-time duration model is used to model bank failures during the antebellum period. Among other explanatory variables, the legal maximum ratio of circulation to specie reserves[4] is used to measure regulation. This is shown to have a significant and positive impact on the odds of bank failures. Supervision is measured by the lowest capital amount actually observed across banks within each state in each year. The impact of supervision on the odds of failure is only significantly negative for small banks in the sample. Hence, stricter regulations (i.e. lower circulation ratios) and stricter supervision (higher minimum capital levels maintained, for small banks) decrease the odds of failure. These outcomes are not too surprising as stricter prudential regulation is meant to minimize risk-taking and therefore keep banks from failing. Strict supervision is to ensure that banks follow the regulations and thus minimize risk-taking as well.

The estimates of the duration model are used in a counterfactual to address the question of the relative effectiveness of each state's regulations for its own banking system as opposed to other state's regulations. The results for this counterfactual show that the odds of bank failure would have increased in all other states under Ohio and Louisiana law from 2.3%, in the case of Ohio banks under Louisiana law, to as much as 61%, in the case of Tennessee banks under Ohio law. The odds would have decreased for all other states under Tennessee regulation, but only significantly for Louisiana. Not all

[3] The data used in this dissertation are now available for all states during the antebellum period; only time has necessitated limiting the number of states used.
[4] Circulating notes from banks were supposed to be convertible into "specie" or gold and silver. Hence, banks kept specie as their reserves.

of these results support the idea that states enacted the "best" regulation with respect to maintaining banking systems. However, in the cases where the odds of failure would have fallen when a state adopted another state's laws, the decreases in the odds are usually small, insignificant or both. The increases in odds, on the other hand, are greater than 2% and typically significant. Tennessee would have experienced the biggest increases in the odds of failure under all other states' laws. Because Tennessee had a core group of banks, owned mostly by the state, it is reasonable to believe that Tennessee legislators had the most interest in their state's banking system and so were especially concerned with this sector's regulation.

To gain a clearer idea of how changing regulation over the period would have affected each state, this counterfactual is performed in five-year subperiods[5]. This exercise reveals that Ohio and Louisiana law still would have increased the odds of failure in all other states, but not in all subperiods. During the first two subperiods, 1830-1835 and 1836-1840, Ohio law would have lowered the odds of bank failure in Louisiana. It is only after 1840 that the impact of Ohio's law would have increased these odds.

Although Tennessee regulation would have still decreased the odds of failure in the other three states, this improvement in odds dissipates over time. The greatest decreases in the odds of failure would have been in the first two or three subperiods. By the last subperiod, 1856-1860, Tennessee and Massachusetts have the same circulation ratio (the regulation variable); hence, Tennessee law would not have affected the odds of a Massachusetts's bank failure.

[5] The first subperiod is six years long, as the period being examined begins in 1830 and ends in 1860.

Under Massachusetts's law, the results are similar in pattern to Tennessee regulation's effect: the impact is much greater earlier in the period than later. Massachusetts' regulation would have decreased the odds of an Ohio bank failure by as much as 2% in the first half of the period. However, in the subperiod 1846-1850 when Ohio reorganized its entire banking system, Massachusetts's law would have actually increased the Ohio odds of failure. Though the impact is negative again for the last subperiod, it is much less than in the first half of the period.

As with the results for the entire period, Tennessee provides the most support for the proposition that local regulators were better at maintaining their banking sectors than external ones would have been. Under Ohio law, Tennessee banks would have experienced significant increases in their odds of failure between 14.5%, in 1830-1835, and 70.6%, in 1856-1860. Under Louisiana law, the range is 19.6% and 55% over the antebellum period. Massachusetts law would have had a positive impact on the Tennessee odds but this effect is only slightly significant in the 1836-1840 subperiod, when it peaks, and then converges to zero by the last.[6]

The rest of this chapter provides an overview of the antebellum period, including a discussion of the literature on the antebellum, or free banking, period.

1.2 Overview of the antebellum period

The era of free banking arose after the demise of the second Bank of the United States (BUS 2) in 1836. The BUS 2 successfully reduced transactions costs of performing intracontinental money transfers and servicing the government and

[6] See sections 3.4.1 - 3.4.4 for complete results of this analysis.

commercial banks. However, Andrew Jackson's Democrats ascended to political office with a populist agenda that included anti-BUS components. Additionally, the country experienced economic prosperity in the 1830s. As a consequence, many citizens had begun to believe Jacksonian fears that the BUS 2 was an undemocratic financial structure, despite its contribution to prosperity. Many small, unit banks also resented having to compete with the Bank's branches. For these political and economic reasons, Congress did not overturn Jackson's veto of the BUS 2's charter, and subsequently its dismantling began in 1832.

In addition to the controversy sparked by Jackson's "Bank War", political factions were allying for and against the construction of a U.S. Treasury that was independent from all banks. Generally, the Democrats fell in the former category and the Whigs, who were in favor of the BUS, in the latter one. In 1836, President Van Buren, a Democrat, proposed an independent treasury but the idea did not make it to a bill. Then, in the wake of the Panic of 1837, Congress passed a bill to erect the Independent Treasury in 1840, what would be Van Buren's last year as president. President Tyler, a Whig, took office in 1841 and the act was repealed. In 1846, the Independent Treasury Act was passed and in 1847 began its operations as the sole receiver and supplier of government funds, which were only made up of hard currency, an additional source of contention between political parties.

The antebellum period is also referred to as the free banking period by authors dealing with the banking issue before the Civil War. It was during this era that states began to pass the free banking law due, in large part, to widespread disillusionment with banking. Before free banking, most banks were required to apply to their state's

government for a charter. The state legislature, the grantor of banking charters, thus possessed the ability to directly control the number of banks operating in the state. The result of such a system was to decrease competition for banks and to increase political corruption. Political opposition to this regulatory regime eliminated the requirement for state government charters. The elimination of this requirement and the demise of the dominant interstate banking institution, the BUS 2, gave rise to the era of free banking.

Contrary to conventional belief, free banking laws were not a regime of *laissez-faire* banking. Rather, the primary emphasis was in easing entry into the banking sector by eliminating the requirement that banks obtain charters from state legislatures in order to operate. Those who wanted to establish free banks only had to meet the requirements of their state's free banking law and then would be issued a certificate or articles of association. However, free bankers were still restricted in how they functioned by prudential, or preventative, regulation that were aimed at controlling the amount of risk a bank could assume in hopes of reducing the probability of the bank's default.[7]

The era of free banking thus created a regulatory system with reduced requirements for entry into the banking sector. However, not all of the requirements for entry were eliminated. Any group was allowed to establish a bank, contingent on other criteria. Although varying amongst states, such criteria usually consisted of requiring a minimum amount of capital, backing circulating bank notes with state or federal government bonds and redeeming notes on demand in specie (gold or silver). As a result

[7] The alternative type of regulation is protective regulation that focuses on protecting bank customers once bank failures have actually occurred. Although some banks constructed this type of regulation themselves (e.g. Ohio's safety fund), few state legislatures mandated protective measures. See Baltensperger (1989) for more information regarding the distinction between the two types of regulation.

of free banking, the state governments enjoyed a new market for public debt, and the banking industry experienced more competition.

Michigan enacted the first free banking law in 1837. This law lacked a market valuation restriction, as defined by Rolnick and Weber (1984), which exacerbated the incentive for risk-taking by bankers. This restriction stipulated that the nominal value of circulating notes must be less than or equal to the market value of bonds which backed them. In the absence of such a restriction, speculators could establish a bank, buy bonds below par value on the market, and obtain the par value amount of notes from the state auditor. As a consequence, banks could issue more and riskier notes. After the notes were issued, the banks could avoid "their debtors by taking to the woods among the wildcats," (Hammond 1963). This oversight in some of the state's free banking laws caused early consideration of free banking to be synonymous with highly unstable, or wildcat, banking (Redlich 1968, Hammond 1957). New York had corrected this mistake and passed their version of the free banking law in 1838. Although several states would come to adopt their own free banking laws, most of which were modeled on New York's version, the bulk of them did so between 1849 and 1853.

These accounts of banking (which predominately took place in the then western states of Michigan, Minnesota and Indiana) caused Redlich and Hammond to evaluate free banking unfavorably. In contrast, Rockoff (1972) claimed that the period was mistakenly judged to be full of corruption when, in fact, free banking was an innovation that may have corrected capital misallocation that prevailed under the chartering system. Rockoff (1974) concluded that free banking did not lead to a significant number of incidences of wildcatting. Indeed, Rockoff indicates that the stereotype of the free

banking period was the exception, not the rule. Following in this vein, Rolnick and Weber (1984) test hypotheses that either (1) instability caused by free banking laws resulted in bank failure or (2) falling asset prices caused bank failures during this period. Although their results are not conclusive, they indicate that falling asset prices are responsible for bank failures. The authors attribute bank failures to declining portfolio values when "economic times turned bad". The preceding is merely an abbreviated review of the existing research regarding free banking. For a comprehensive review of this literature, consult Calomiris (2000).

In addition to geography, culture and views on slavery, a divide existed between the North and the South with respect to branch banking. Calomiris and Schweikart (1988) offer a rare look at the relative banking performance between the North and South during the antebellum period. The authors provide useful aggregated state-level data for banks in New York, Ohio, Virginia, Georgia and Alabama. These aggregated data are used to demonstrate that Southern banks performed at least as well as their Northern counterparts during the 1850s. Nevertheless, the authors warn against measuring Southern banks by the yardstick of Northern ones because the two regions evolved within very different contextual circumstances. Many states in the North developed explicit co-insuring systems; in contrast, the South utilized an implicit co-insuring system via branch banking. Calomiris and Schweikart conclude that credit was not a constraint on manufacturing in the South. However, the authors also note that the same conclusion cannot be shown for agriculture, especially in spatially distant or sparsely populated areas.

Although the North-South partition is relevant, a more compelling narrative is generated by an examination of individual states within these regions. The four states studied in this research were distinct in many respects, not the least of which was their economies. Massachusetts was an element in the industrializing Northeast. Ohio's output was largely agricultural at the beginning of the antebellum period but became increasingly manufactured output by the time of the American Civil War. Tennessee remained primarily agricultural throughout the period; while Louisiana possessed a mixed economy of commerce, trade and agriculture. More pertinent to the present analysis, each of these states had active, but distinct, banking systems. As a set for analysis, these four states provide geographic, regulatory and banking diversity. Each is discussed in detail in the following chapter.

CHAPTER 2

THE POLITICAL ECONOMY OF BANKING REGULATION, 1830 – 1860

2.1 Conceptual Models of Banking Regulation

It is difficult to determine an appropriate theoretical framework for studying banking regulation because of the number and complexity of the agents involved. Therefore, this section provides an outline of a number of approaches to consider why regulation is imposed and how it develops. Kane contends that regulation evolves according to the regulatory dialectic (Kane 1977). In this framework, re-regulation occurs to compensate for financial innovations, which allow banks to evade the costs imposed by regulation. Although this theory explains changes in regulation, it does not provide some set of first principles that explain why regulation exists.

Kroszner (1999) outlines five general approaches that have been used to study how government intervention and regulation occurs. These are ideology, leviathan, institutions, private interest and public interest. The first, ideology, describes how the beliefs of voters and politicians affect contemporaneous regulation. The leviathan approach to government intervention contends that government seeks to increase its size and importance. In addition to regulation, the government may also create institutions that facilitate this goal. This makes the leviathan approach difficult to distinguish from the institutions approach, which claims that changes in policy result from changes in

institutional arrangements and transactions costs. Changes in these arrangements and costs may alter the incentives of special interest groups leading to alterations in the set of incumbent policymakers and their decisions. The private interest and public interest models are self-explanatory. The former emphasizes the motivations of the special interest groups affected by the regulations and their efforts to induce regulators to act in their favor. Public interest assumes that regulations are imposed in an effort to maximize social welfare by providing a reliable and effective banking system. These approaches have been applied only recently to nineteenth-century financial regulation.

These theories are not mutually exclusive. Various characteristics of early banking regulation can be attributed to more than one of these theories. Harry Miller's text on banking theories before 1860 concludes that the main functions of banks were to distribute loanable funds and to supply media for payment (Miller 1927). These functions of banks support the public and private interest aspects of banking regulation. Banks profit by providing loans, and depositors gain security through the use of checking deposits and regulated note circulation. The private interest theory may be illustrated by lax circulation-to-specie requirements allowing banks to print notes backed by little specie. Another indication of private interest is low paid-in capital mandates such that a bank could begin operation when only a fraction of its capital was paid in and the rest had been subscribed but not paid.

On the other hand, the public interest theory claims that regulation maximizes social welfare. The degree to which the patrons of banks benefit from regulation substantiates the appropriateness of this theory. The main contributions of banks are to provide security and convenience for depositors. Security measures include mandatory

bond-backed notes and annual reports to state treasuries. Additionally, borrowers' interests are reflected through the establishment of usury laws. Determination of the appropriate conceptual model is dependent upon the prevailing political ideology of the place and time.

Indeed, ideology is the source of much of the antebellum period's regulation. The pejorative language, such as "evil" or "immoral," used to describe banking activity reflects this aspect. A popular fear of banks is a common theme in early financial literature. Cited reasons behind such beliefs during the free banking period include (1) fears of a powerful, monied interests that do not represent the will of the people, (2) fear of foreign control of domestic interests, (3) fear of bank failures and suspensions, and (4) increases in the inequality of wealth distribution. The idea that fear would play a role in regulation certainly conveys the contributions of ideology in policy making. That these fears did not destroy the institution of banking also suggests that ideology was only a part of regulatory motivation.

The ideology approach is connected to the institutions approach, especially with respect to the banks' role in allocating credit. It is less costly for banks to assess creditworthiness in contrast to individuals. Additionally, banks can provide credit that is widely accepted. The latter aspect pertains to the institutional structure of the bank. In order to be established, banks had to adhere to criteria defined by their states and in doing so they sent a signal to holders of their notes. This institutional arrangement permitted bank credit to be more acceptable in transactions than that of an individual creditor.

Banks also allow for easier transfer of funds through the use of bank notes and bills of exchange by depositors. Regulation that permits methods of payment other than specie illustrates the role of institutional change.

The leviathan approach is the theory that regulation exists as a means for governments to increase their size and power. It is often claimed that before free banking laws were enacted, state governments granted charters to banks in exchange for favorable credit access to the government. Even with free banking laws, governments often included clauses mandating that notes be backed by state bonds. These laws also included many specifications regarding the conduct of banking. Clearly, these are methods by which the state government could extend its power and raise funds.

Although these approaches do not provide a single, simple origin for financial regulation, they all contribute some degree of understanding. Changes in ideology over the period are reflected in changes in the relative importance of the leviathan, public interest and private interest approaches to legislation. Hence, the realization of actual regulations during a certain period reveals which type of agent (the regulator, the customer or the banker) most influenced the prevailing regulation in that period. During the antebellum period, the dominant approach to regulation can be ascertained by examining the nature of the laws and the intensity of enforcement. Knowledge of these issues is relevant to both historical and contemporary regulatory issues.

2.2 The political economy of banking regulation in antebellum Massachusetts

Of the four states in this study, the Massachusetts banks have received the most attention in the literature. Most notable is Naomi Lamoreaux's Insider Lending (1994),

which details the impact of personal relationships in the banking industry in New England during the antebellum period. Although Massachusetts has the oldest banking system, Lamoreaux claims that its established reputation does not factor into the success of a bank in Massachusetts, as one might assume. This is confirmed empirically in chapter 3 by the non-significant impact that a bank's age has on its ability to remain in operation. This fact is also suggested by the increasing number of banks in Massachusetts from 1844 through the end of the period, as depicted in figure 2.1. Although by 1830 Massachusetts possessed greater banking experience than other states, it, like the other states, still experienced an increase in the frequency of regulation in the antebellum period.

Perhaps the most distinctive feature of the Massachusetts banking sector is the existence of a clearinghouse system called the Suffolk System. This System began in 1818 and was so-called because the Suffolk Bank of Boston founded it. It facilitated note redemption and was operated by the largest Boston banks. The System provided the ways and means for the large Boston banks to share the cost of transporting country bank notes, which had been redeemed for specie, back to their bank of origin. Each member country bank was required to keep deposits at the Suffolk Bank. Additionally, when a certain amount of the country bank notes had been accumulated in Boston, they would be returned to the country bank for redemption. Small rural banks agreed to such an arrangement because it increased their circulation. In 1858, the Bank of Mutual Redemption, another clearinghouse, was chartered, which eventually replaced the Suffolk System; throughout this antebellum period there was an active clearinghouse system.

Though a distinctive feature of the Massachusetts banking system, these clearinghouses were private institutions and so their existence does not reflect the policies of the state's government.

The Massachusetts banking sector almost doubled between 1830 and 1837, as shown in figure 2.1. Demand for credit was large, prompting many bankers to ignore an 1829 law that required all banks to keep half of their paid-in capital in specie.[8] As circulation and deposits increased, specie fell proportionally. This exacerbated the impact of the 1837 panic on Massachusetts' banks. Figure 2.2 shows that most of the banks that closed in Massachusetts in this period did so in the late 1830s and early 1840s, due to the Panic and subsequent recession. The banks suspended payment in May of 1837. This was earlier in the year than most other states, suggesting the particular severity of these shocks felt by Massachusetts. In response to the Panic of 1837, the state created a Board of Bank Commissioners in 1838 that annually conducted examinations of all the banks in the state. The establishment of the Board to examine banks indicates both a leviathan and public interest motive. The former motive is implied by the new power that the legislators had to appoint a committee that could actually investigate the operations of any bank it chose. The public interest objective is also implied because banks were now subject to possible examination and would, presumably, be less risky in their endeavors. The 1835 law that made stockholders personally liable for bank losses in proportion to their shareholding also indicates that legislators were working in the public interest. This type of clause was known as the "locofoco principle" (Winkle 1988) by some opponents. It was to provoke stockholders into ensuring that their bank took less

[8] This ignoring of the law is evidenced by balance sheet data. See table 3.3.

risk, lest they be held personally responsible. Given that banks appeared to be ignoring some of the legal mandates, a law that placed the costs of insolvency upon stockholders was a clear method of creating the desired incentives for bankers. It was also a method that other states attempted to implement with unfavorable reception.

Lamoreaux proposes that the 1838 law also marked the beginning of a trend of Massachusetts's lawmakers attempting to protect bank stockholders relative to bank directors. The legislators were presumably working in the public's interest by attempting to protect 'ordinary' people who were stockholders as opposed to lifetime bankers. In addition to establishing the Board of Bank Commissioners, this law offered "special privileges" to any bank that agreed to limit the amount of loans to its directors to 30% of its capital, unless explicitly otherwise authorized by the stockholders. The legislators had noticed that a large share of bank loans were made to those who ran the bank and they sought to protect the smaller investors in the bank who rarely participated in actively operating the bank This law attempted to protect the shareholding public from the excesses of the bank directors and officers; however, not surprisingly, only 29 banks opted for it out the 120 banks open in Massachusetts. (Lamoreaux 1986) Figure 2.2 shows that these attempts by the legislature in 1838 did not prevent the many bank closings that occurred in the early 1840s.

The preferential legislative treatment towards stockholders and away from directors continued with an 1840 law specifying that directors and other bank officers were allowed only to cast 10 proxy votes at stockholder meetings. Other stockholders were permitted 50 votes. Of course, given the close relationships between some of the larger stockholders, it was rather easy for bank directors to circumvent this law and have

their friends or family who were regular stockholders cast 50 proxy votes towards their agendas (Lamoreaux 1986). In 1843, the Board of Commissioners was disbanded and replaced by a "special committee," presumably with fewer duties and less power. This could be construed as working in the banks' private interests but the law also instituted a change to existing law that made it easier for stockholders to initiate investigations on their bank. All that was needed was a minimum of one-eighth of the stockholders to vote in favor of an investigation into their bank's practices. This law, which seems to be in the public's interest, may have contributed to the relative few and far between bank closings that occur from 1844 throughout the rest of the period.[9] However, the national economy was recovering at this time and Massachusetts's banks were able to resume payment in specie in 1844. The effect of the 1843 legislation most likely did not override these other underlying factors.

The very first bank in the United States was chartered in Massachusetts, the Massachusetts Bank of Boston, 1784. The petitioners for this bank wanted to provide credit, a money supply and convenience for business transactions to the community (Gras 1937). These goals expressed the desire to establish an institution to serve in the public's interest. By the 1820s, motives for the petition for bank charters were more in the interest of a subset of the community, e.g. the mechanics or planters (Lamoreaux 1994). By the 1830s, having to obtain a charter in order to erect a new bank did not seem to be a prohibitive barrier to entry as evidenced by figure 2.1. Until the Panic of 1837, the 1830s saw a tremendous increase in the size of the Massachusetts banking sector. Though this sector decreased in size by about one-sixth from 1837 to 1844, the rest of the period

[9] See figure 2.2.

experienced growth of over 70% by 1860. Therefore, when a free banking law was passed in Massachusetts in 1851, a thriving banking system was already in place and had been working for quite some time. The timing of the passage of the free banking law followed in line with a national trend. Twelve of the seventeen states that ratified a free banking law during the antebellum period, including the four states studied here, did so between 1849 and 1853.[10] The free banking law, known for easing barriers to entry, had little impact on the size of the Massachusetts banking sector as evidenced by the fact that only seven banks were founded under it.

In addition to easing entry requirements, the free banking law stipulated that the Board of Commissioners (which had ceased operations in 1843) be reestablished. The legislature coupled its free banking law with one that allowed any five stockholders to convene an investigation of their bank. In the six years previous to the passage of the free banking law in Massachusetts, only two banks had closed. The ease with which stockholders were allowed to initiate examinations on their banks after the 1843 law may have contributed to such low failure rates over the late 1840s but there is no solid evidence to confirm this. However, the fact that the legislature passed an 1851 law that made it even easier for stockholders to commence investigations than the 1843 law had suggests that legislators believed that this aspect of the 1843 law was a primary reason for the banking sector's success over the previous years. Both the increase in the ease of entry to banking provided by the free banking law and the improved ability of stockholders to keep their bank directors in check imply a continued interest in maximizing social welfare on the part of the state lawmakers. This legislative concern

[10] Of the other free banking states, three states passed this law in 1837 or 1838 and three passed this law between 1857 and 1860. Note that Michigan passed this law on two separate occasions, 1837 and 1857.

may also be reflected in the 1852 law that amended the free banking law by prohibiting the amount of a bank's note circulation from exceeding its capital stock. Also in that year, bank commissioners ordered any existing branches be closed and banned branch banking altogether. The Massachusetts banking sector, unlike those of the South, consisted primarily of unit banks. The Suffolk System provided the insuring aspect that branching provided in the South, and thus this law had no practical ramifications. The common fear that branch banking promoted a concentrated sector of the 'monied interests' must have motivated this law, suggesting that it too was passed in the public's interest. Perhaps this law was a preemptive measure against possible large, bank monopolies or oligopolies, but the state had never experienced this problem despite the legal ability for banks to branch until 1852.

Due to the nature of the motives underlying banking regulation, several of them may be indistinguishable from one another, especially because the outcomes of regulation were not always intended ones. In Massachusetts, the legislators seemed to be acting in the public's interest on several occasions. The establishments of bank commissioners to examine banks and the promotion of stockholders' interests over those of bank officials appear to support this view. However, both of these acts were also in the interest of the legislature, who, as the representative of the state, was a stockholder itself. By controlling the board of bank commissioners and advancing the rights of stockholders, the legislators were implicitly giving the government more power, thus engaging in the leviathan motive. Though this may be a particularly cynical view, it illustrates how the various regulatory motives can be confused. Other legislation, such as limits on note circulation and the elimination of branching, suggests that the Massachusetts legislature was, indeed,

attempting to act in the best interest of the public, by reducing noteholders' risk and curbing the prospect of monopoly. The easing of requirements for stockholders to initiate bank exams also suggests that the legislators were trying to maximize social welfare; although, the state was also a stockholder in several banks and so was implicitly giving itself this power as well. Whatever the motive, the Massachusetts regulators were quite successful at maintaining an active and growing banking sector. The turbulent times caused by the Panic of 1837 were not repeated by the Panic of 1857. In the last half of the antebellum period, Massachusetts underwent a good deal of sustained growth in the banking sector.

2.5 The political economy of banking regulation in antebellum Ohio

Ohio's antebellum experience with banking was different from the other three states in this study in that the topic of banking was more intensely and publicly debated during the first half of the period. The division between the Democrats and the Whigs even blurred as some Democrats split with their party on the banking issue during the 1844 election and gave the Whigs control of the governorship until 1850, the longest stretch that either party had previously enjoyed in the antebellum period. The story of Ohio's banking regulation can be best represented by the struggle between public and private interests. Of course, as with the other states, the distinction between these two objectives was not always so straightforward.

Ohio legislators, like those of many other states of the period, emphasized the construction of internal improvements during the 1830s. For this reason, there was a great demand for credit, especially after the close of the BUS 2. Ohio's banks met this

demand with a rapid increase of bank paper. Although Ohio had mostly small, unit banks, it did have one of the largest banks in the entire country, the Ohio Life Insurance and Trust Company.[11] By the end of the decade, the number of Ohio banks had more than doubled as shown in figure 2.3.

Like other states, Ohio banks suspended payment in 1837. Reports from many of the state's banks attributed this suspension to the specie circular[12] but there are many theories about the Panic of 1837, most notably Temin (1969)[13]. This was when discussions of bank reforms moved to the forefront in political debate. Although Ohio banks resumed payment in specie in 1838, the banking system was not yet capable of converting notes to specie and a general suspension occurred again in 1839. The Panic of 1837 caused new Ohio legislation in the form of the Bank Commissioner Law in 1839. Similar to an 1838 Massachusetts law, the Ohio law restricted the maximum legal ratio of circulating notes to specie reserves and also established a committee comprised of three bank commissioners to examine the state's banks regularly and to report the results to the state government. As with Massachusetts, these measures demonstrate both the public interest and leviathan motives.

The Democratic governor at the time, Wilson Shannon, proposed that banks be allowed to print notes of small denomination to help ease the currency crisis caused by the Panic. In return, he lost the support of the members of his party who wanted paper

[11] It has earned an infamous reputation in free banking history, as its failure is often considered the cause of the 1857 panic.
[12] A federal mandate that all purchases of public lands be made in specie.
[13] Temin believes that the Panic was caused by a drop in cotton prices, which affected the South in particular, and Britain's tight money policy meant to curb outflows of specie. Together these effects yielded a drop in total US specie to which Temin attributes the Panic.

money to be completely eliminated. Shannon was defeated in the 1840 gubernatorial election but the Democrats retained both houses of the state legislature.

One of the problems confronting the legislature was the approaching expiration of many bank charters at the end of 1843. This fact, coupled with the continued dissatisfaction of the performance of the banking system, caused the Ohio legislature to consider new legislation. With control of the state congress, the Democrats passed the Latham Banking Act in 1842, despite the presence of a Whig governor. Among other interventions in the banking sector, this law created a special tax on circulation and capital. Additionally, the president, directors and officers of the bank were made personally liable for any losses of capital or to noteholders, the "locofoco principle". By placing the risk of default on bank officials, the ostensible objective was in the public's interest, but the special tax would contribute to state coffers should banks be established under this law. Despite the possible leviathan interpretation of the law, the public supported it and, in 1842, a Democrat won the election for governor with an anti-bank campaign. The severe Latham Act that had been enacted to deal with the impending charter expirations was not appealing to many bankers. Those banks whose charters were expiring did not want to re-charter under such a law and thus it failed to prevent the number of banks from declining due to expiring charters. As illustrated in figure 2.4, about a third of Ohio banks closed at the end of 1843.

The impact on the availability of credit and currency due to bank closings further provoked a split in the Democratic party between those that supported the banks and paper currency, and those that wanted only hard currency. Many of those in the former group were bank directors or board members themselves (Winkle 1988). Perhaps the

most overt evidence of the Democratic party division was the passage of the Wooster Bank Bill in 1844, which protected the charters of the Bank of Wooster and four other banks from expiring until 1850. The legislators who supported this bill were clearly allied with bankers; thus, this bill indicates the existence of the private interest motive for regulation. However, the lines between public interest and private interest may have been blurred as the economy was suffering from a lack of funds so the legislators in support of the Wooster Bill could have made a case for the protection of credit lines in such a difficult period. Then again, some of the legislators were actually bankers too. In this case, the potential for the legislators to use the legal system to forward personal agendas was great but some of their actions were not mutually exclusive to increasing social welfare.

The cleavage in the Democratic party, sparked by the Latham Act, and the ongoing recession, since the 1837 panic, allowed the Whigs to regain the governorship in 1844 and propose new banking regulation. The most popular proposals under consideration included both the adoption of a State Bank, similar to neighboring Indiana's, and a safety fund system, similar to New York's (Huntington 1915). The result was the Kelley Bank Act of 1845, which created a state bank (the State Bank of Ohio) and a system of independent banks. More importantly for the banks, this act repealed the Latham Act and restored limited liability for bank officials. The state was divided into 12 districts and the number of banks in each district was controlled. The State Bank was permitted to branch, but the branches would be operated as separate unit banks. As soon as seven branches had been created, a Board of Control was to be established. The purpose of the Board, which acted like a central bank, was to supervise

the operations of the branches. Also, each branch was required to contribute ten percent of the amount of its circulation to a safety fund. Any branch that failed to redeem its notes in specie was considered insolvent and the other branches had to provide specie, in proportion to their circulation, to redeem the notes on which the insolvent branch had defaulted. Independent banks that were not branches had to provide the State Treasurer with State or Federal bonds equal to the amount of their capital stock, which the Treasurer would sell in order to redeem the bank's circulation in the event of its failure.

As noted earlier, the branches of the State Bank operated independently of each other. They were required to back their notes with state treasury bills deposited at the state treasurer's office. The Ohio Treasury then issued the bank notes based on the amount deposited. This aspect was adopted from free banking laws that had already been passed in a few states. For additional security, the state examined each independent bank annually. Many banks were established under the Kelley Bank Act, unlike the Latham Act. Some banks with expired charters reorganized as independent banks. As an indication of the system's success, only a few Ohio banks failed in the late 1840s while the size of the banking systems nearly quadrupled from 1845 to 1848.[14] The Kelley law enabled a much larger banking system to exist in the latter half of the period than had the earlier one.

Although maybe not the primary objective of legislators, the Kelley Act provided much-needed bank credit and notes in addition to improved security for depositors via the safety fund and increased competition. Hence, this law was partially aimed in the public's interest. The Act also gave the government greater control over the banking sector by

[14] See figure 2.3.

establishing a Board of Control and mandating the purchase of state bonds for backing. The bankers also benefited from this legislature by the removal of the personal liability clause that the Latham Act had imposed and providing banks with a selection of possible bank types. The Kelley Bank Act seemed to be a good confluence of all the agents' interests. The 1846 gubernatorial election was a test of the public's perception of the new banking system. In fact, Winkle calls this election "the referendum on the banking question" (Winkle 1988). As mentioned above, the Whigs, the incumbent party, won the election and the banking system remained unchanged for six years.

In 1851, Ohio passed a free banking law despite some opposition but in accordance with the national trend. Similar to other states, Ohio's free banking law was also modeled on New York's. However, a new Ohio constitution was adopted in 1852 and, after thirteen free banks had been established, the Democratic attorney general decided to interpret the vagueness of the new constitution as prohibiting the establishment of any new banks under the free banking law; in essence, nullifying the law. In 1856, the Ohio Supreme Court ruled that the 1852 state constitution had not nullified the free banking act; however, no more free banks were founded.

The financial failure of the Ohio Life and Trust Company in 1857, and the subsequent panic, impacted Ohio greatly. The Board of Control attempted to prevent the branches of the State Bank from suspending by establishing a contract with its cashier in New York that provided enough assets to satisfy the Branches' demands. Although most of the Branches continued making specie payments, five of the forty-one branches failed. The other failures consisted of three independent banks, three free banks and the Ohio

Life Insurance and Trust Company. However, the majority of the banks founded under the 1845 and 1851 laws survived the 1857 financial crisis.

Of the three states, Ohio seemed to have been the one with the most turmoil caused by the banking question while also being the one to have most successfully dealt with it. The suspensions due to the Panic of 1837 pushed the banking issue to the forefront of politics. The legislature promoted both public and leviathan interests by limiting risk via the lower the amount of allowable circulation and establishing a bank commissioner in 1839. This clearly did not rectify the problem as a few banks closed in 1841. The Latham Banking Act passed by the Democrats as a measure to divert risk from the depositors to the bankers and promote social well-being prevented any relief for banks as several more banks closed in 1843. Finally in 1845, the Kelley Bank Act resolved a great many of the problems by promoting the public and banks' interests. This Act allowed a great expansion to occur in the banking sector, which was relatively stable until the failure of the Ohio Life Insurance and Trust Company. Though the Board of Control, established by the Kelley Act, was unable to prevent any bank losses, it provided an entity that could at least assuage the impact of such an event. The Ohio banking sector ended the antebellum period with over four times as many banks as it had in 1830. The drastic and deliberate change in Ohio banking regulation that occurred in 1845 makes it a particularly interesting state for this study of the relative effectiveness of local, versus external, regulation.

2.4 The political economy of banking regulation in antebellum Louisiana

Louisiana is distinct from the other three states for many reasons, not the least of which is its French, as opposed to British, heritage. Louisiana became a United States territory in 1803 and received statehood in 1812. During its territorial period, many people from other states began to move to Louisiana because of the promise of fertile, cheap land. The people of French or Spanish descent who were already living in Louisiana, the Creoles and Cajuns, called the new immigrants 'the Americans'. Additionally, many people emigrated from France, as refugees from the Napoleonic Wars, and relocated in Louisiana because of its similar heritage. As with other states, there were, of course, the Irish and Germans. Consequently, Louisiana's ethnicity was even more diverse than other states.

There is no doubt, however, that it was the Creole population who wrote the state's first constitution in 1812. The 1812 constitution favored the southern region of the state with respect to representation through voting (Adams 1973). Sugar plantations owned by Creoles dominated this region. The Americans tended to be cotton planters in the northern part of the state and the region west of the Mississippi but north of New Orleans, 'the Floridas.' Another example of how this constitution favored the Creoles, or native population, was that it mandated elections be held in July. Many of the Americans would leave the state during the hot summer months as they regarded this the "season of death" (Tregle 1999). The Americans were much more susceptible to diseases spreading in Louisiana than the "natives." In addition to favoring the Creoles, this

constitution was extremely difficult to amend; hence, this document remained Louisiana's constitution, unchanged, until 1845, after the state leadership switched political parties.

The Whigs (or National Republicans) controlled the Louisiana governorship from 1824 until 1843. These men were of French descent, as the foreign French allied with the Creoles in most elections and outnumbered the Americans. They were Whigs, in large part, in order to be anti-Jackson rather than pro-Whig. Nonetheless, it was during this period that the banking system experienced its most rapid growth, as seen in figure 2.5. However, due to the Panic of 1837, it was also in this period when most of Louisiana's bank closings occurred.

Due to the success of two earlier chartered banks, the Louisiana State Bank (1818) and the Bank of Louisiana (1824), the Louisiana legislature chartered the Union Bank of Louisiana in 1832. Like the other banks, the state government backed the capital for this bank and the governor appointed its directors. All three of the banks survived past 1860. Also in the early 1830s, a few other large banks were founded with a great deal of state backing. These met with mixed success due to the financial panics of the period. Unlike the other three states, almost all of the Louisiana banks, state-sponsored or not, held capital in excess of $1 million.[15] Such large banks were needed for the tremendous amount of commerce that occurred in New Orleans due to its favorable geographic characteristics. Indeed, all of the Louisiana banks during the antebellum period were based in New Orleans, though many had branches in other parts of the state.

[15] This is the criterion for being labeled a "large bank" in the empirical model of chapter 3.

When the Panic of 1837 struck, the Louisiana banks suspended convertibility and several began to be liquidated. Louisiana was greatly affected by this panic due to the falling cotton and sugar prices and the over-speculation in land that had been taking place in the state during the decade. This crisis led to a great deal of debate over the solution to the banking crisis. By early 1939, banks had resumed specie payments. An 1839 law requiring banks to forfeit their charters if they suspended (again) for even a day was passed but it also allowed banks to reduce their capital to that which was paid in, which transferred more risk to noteholders and depositors. Later in 1839, banks again suspended payment. Although the 1839 law, and others with similar mandates, was largely unenforced, over half of the banks closed in 1840. This prompted another round of debates both in the legislative sessions in early 1840 and 1841 but these were too contentious to end in the passage of any banking legislation. By December of 1841, the lack of credit and currency was too much to be ignored and the legislature finally passed the Louisiana Bank Act of 1842.[16]

The 1842 law was most notable for mandating specie reserves be one-third of all cash liabilities, meaning deposits and circulating notes. The other two-thirds had to be backed by short-term (less than ninety days) commercial paper. This law, in addition to other provisions, also provided enforcement of earlier laws, which stipulated banks were not permitted to suspend payment, by forcing banks to resume payment within 25 days or be sued by the attorney general of Louisiana for their charters. Even banks that were able to resume specie payments still had to express, in writing, their acceptance of the law or

[16] Green (1970) provides a detailed description of issues surrounding the five-year debate that culminated in the Bank Act of 1842, sometimes referred to as the Forstall system, though not by Green. Much of its recognition today comes from its being the forerunner to the National Banking Act in 1863 and the Federal Reserve Act in 1913.

be sued for their charters. Banking authorities applauded the 1842 act for many years; the November 1877 issue of *Banker's Magazine* claimed the act to be "among the most enlightened pieces of banking legislation to be found on the statute books of any country" (Green 1972). This law was an effort to resume specie payments and relieve credit needs, while reforming the aspects of banking believed to have contributed to the crisis. Though the 1839 law was enacted in the public's interest to ensure note payments, the lack of its enforcement and the stalemate within the legislature may have contributed to the closing of eight of Louisiana's fifteen banks in 1840, as illustrated in figure 2.6. However, the restrictive measures imposed by the 1842 law was an appropriate correction as evidenced by only two banks closing after 1840, the City Bank of New Orleans in 1849 and the Consolidated Association of Planters of Louisiana in 1852. Though this law seems to have been passed in the interest of the public, i.e. noteholders and depositors, Green (1970) is sure to mention that there were several more restrictive mandates, which were not included in the final bill.

As a clear result of popular support of the 1842 Act, passed in February 1842, the Democrats, the anti-bank party, swept the July 1842 elections (Green 1970). For this first time since 1824, a Democrat sat in the governor's seat of Louisiana. Subsequently, a new state constitution was written and ratified in 1845. Among other changes, this constitution prevented direct aid to corporations, eased voting requirements and increased the number of elected government offices. Most notably for this research, the document also stipulated "No corporate body shall be hereafter created, renewed, or extended with banking or discounting privileges," (Thorpe 1909). The mandates of the new constitution limited the interaction between the state government and corporations and expanded the

influence of the populace. Both of these measures appear to have been motivated by a concern for social welfare and against the leviathan objective for regulation. However, in attempting to remove corporate influence from the state government, the 1845 constitution made it impossible for new banks to be established in the state and for existing banks to be extended. Though their motive may have been to promote the public's interest, the legislators' policy on banking clearly only supported the anti-bank public. With respect to the private interest motive, this constitution worked both for banks, by eliminating entry, and against them, by prohibiting the renewing or extension of their charters.

Corporations, clearly, gained favor in the legislature as the 1845 constitution lasted only seven years. In 1852, another state constitution was passed which enabled banks to be established by special legislative acts or general laws. This gave way for the passage of a free banking law in 1853.[17] The renewed ability for banks to be established did more for advancing the public's interest by allowing competition in the banking industry. Two new banks were established under the free banking law and five more existing banks became free banks.

Louisiana's system of mostly large banks managed to weather the Panic of 1857 without a single closing. In fact, there were three new bank openings in 1857, which all survived the Panic. This occurred because, unlike in 1837, this national financial panic was not exacerbated by intense land speculation, which had left many banks with insufficient funds to make specie payments. In addition, under the 1852 constitution and 1853 free banking law, the legislators had managed to address the problems that plagued

[17] The free banking law in Louisiana was rewritten without substantive change in 1855.

the banking system during the Panic of 1837, when almost all of the period's closings occurred. The banks in Louisiana were primarily providers of credit for farmers and merchants. Their business dealings relied on land, crops and cargo, i.e. real assets and goods. The failure of the Ohio Life Insurance and Trust Company is believed to have precipitated the Panic of 1857. This type of panic spread because of financial connections, as opposed to commodity trade, between states. Hence, Louisiana managed to avoid any negative impact on the size of its banking system from the 1857 panic. Unlike the other three states whose bank closings largely consisted of small banks, the Louisiana banks that closed were a mixture of large and small banks. The regulation established in Louisiana must not have sought to protect either size of bank in particular. However, none of the aforementioned large banks that the state government supported closed during the antebellum period.

Of the four states, Louisiana's banking system is the only one that peaked, with respect to the number of banks, near the beginning of the period. Louisiana experienced most of its losses after the Panic of 1837 but, unlike Massachusetts, did not undergo such growth again. The backlash against the administration for the failures in the banking industry, that reduced circulation and credit access in the early 1840s, was so great as to cause the turn over in the governorship to the Democrats in 1843, who retained it for the rest of the period. In addition to the Bank Act of 1842, the restrictive changes they effected included a new constitution that forbade any new banking or extension of existing banks. Though this provision would be eased by the passage of another constitution, the 1842 Act remained a key piece of legislation governing Louisiana's banks. The new constitution allowed the passage of the free banking law, which did incite

entry but not to the degree that had occurred in the 1830s. Louisiana exhibited a clear division in its governance: from 1830 to 1842, the governorship was partial to business and anti-Jackson; from 1843 on, the governorship was very anti-business and pro-popular sovereignty. The impact of this partition is clearly seen in figure 2.5, where the banking sector reached its largest in the late 1830s. It would take until 1853 for Louisianans to permit such freedom of entry and even after that, the banking sector did not reach its previous heights. Fortunately for the state, the 1857 panic did not impact their banking system and cause another adverse reaction against the banks. Louisiana ended the period on an upswing. If not for the Civil War[18], Louisiana, who had begun to solve its credit problems, may have been able to better utilize its natural resources and become a prominent state economy.

2.5 The political economy of banking regulation in antebellum Tennessee

The people of Tennessee were very concerned with liberty and republican values during the antebellum period. It was one of the few states that experienced an established two-party system and frequently alternated between these two parties, the Whigs and the Democrats. Though much of what the state legislators debated over this period centered on federal, rather than local, issues, the position that each side took on the national issues colored their beliefs on local ones (Atkins 1997). For instance, the Whigs were more federalist in nature and supportive of a national bank, while the Democrats were more in favor of popular sovereignty within states and supported an Independent Treasury for the United States. Though the parties held different views on the way in which the state

[18] Louisiana seceded in January of 1861.

should be governed, the actions of both sides often suggested that they were concerned with the power and size of the government, cited above as the leviathan approach to regulation.

Tennessee became a state in 1796 but did not charter a bank until 1807. Even before the antebellum period, the structure and regulation of the banking industry was a topic of debate in the Tennessee legislature. The first state bank was chartered in 1811. This institution, the Bank of the State of Tennessee, continued the operations of the recently closed Knoxville Branch of the First Bank of the United States. In response to the Panic of 1819, but despite protest, the charter for an additional state bank, the Bank of the State of Tennessee in Nashville, was granted in 1820 "to relieve the distresses of the community and to improve the revenue of the state," (Campbell 1932). However, by the end of the decade, anti-bank forces in the state congress had succeeded in having the 1811 State Bank closed and persuading the governor to recommend a discontinuance of the second State Bank. Soon after this recommendation, newly discovered corruption within the 1820 State Bank caused the legislature to demand that it close as soon as possible.

In addition to closing the Bank, the legislature passed a law in 1827 that mandated that any firm wishing to carry on banking activities must obtain a charter. This law reflects the private interest view because forcing new banks to obtain charters would erect a new barrier to entry and thus competition. Also, this law reflects the leviathan

approach because it gave legislators the power to control not only the size of the banking sector but also the operational details of banks by defining the specificities of what they were permitted to do in their charters.

By 1832, the state bank in Nashville had not completed its closure but was withdrawing its funds from circulation. This contraction worsened the pressure on the community, causing popular demand for a new bank. The legislature satiated this demand by chartering the Union Bank of the State of Tennessee in 1834. Interestingly, this bank was originally voted on in the previous year but the Democrats had included a personal liability clause, also known as the locofoco principle, for stockholders in the first charter. This prevented the Bank from acquiring enough stockholders to provide the requisite capital for the Bank's opening. Therefore, in 1834, the legislator had to revote on the charter after removing the personal liability clause. The Democrats attempted to ensure that any potential losses to depositors would be offset, thus demonstrating the public interest theory. The Whigs were concerned over the lack of available credit for the state's economy. This could also be construed as being in the public's interest because a better-running economy improves social welfare. However, the risk of engaging in banking activities fell on the depositor under the Whigs' plan.

Figure 2.7 shows the total number of Tennessee banks that were open in each year of the antebellum period. These state banks comprised the entire Tennessee banking system for most of the period. Thus the state had both a self-interest and a public interest motive for keeping these banks in operation. It is possible that the empirical modeling may be influenced by this artificial survivability of the early banking system in

Tennessee but, as shown in figure 2.8, most of the variability in the banking sector came at the end of the period when more banks were open in the state.

Near the end of 1837, a national financial panic had begun. Due to the ensuing lack of hard currency, many of the banks in the Northeast suspended payment of deposits in specie. As the Panic spread, banks in the rest of the country suspended specie payment as well, including the Union Bank and the Planters Bank of Tennessee. The state legislature appointed a committee to examine the banks, with special attention given to these two large banks in which the state had a large capital subscription. Because the banks' charters forbade suspension of specie payment, the Democrats in the legislature attempted to execute the forfeiture of their charters. Though this was potentially just a ploy to encourage banks to begin specie payments, the Whigs, who controlled the governorship, were able to prevent this from happening by arguing for leniency due to the national character of the crisis, which had put a strain on much of the nation. The banks began making specie payments in 1838 but were unable to sustain this and re-suspended in late 1839. Once again, the Democrats, who had just regained the governorship, attempted to have the banks surrender their charters. Fortunately for the banks, this never occurred because some Democratic legislators crossed party lines to vote against it. These legislators may have been working under the influence of the banks, exhibiting the private interest approach; however, the impact of closing these banks on such a small banking system would have been devastating for the local investors and depositors as well, suggesting an element of the public interest motive. Not only did these banks survive the Panic but also the suspension actually incited the legislature to found another state bank, the Bank of Tennessee in Nashville, in 1839. This

was further indication of the pro-bank attitude of that legislature. In fact, this Bank evolved into the role of a central bank for Tennessee and proved to be the keystone of the predominantly state-owned banking system in Tennessee throughout the rest of the antebellum period.

There was a great deal of dispute over the Bank. It had provided much-needed funds to the state for internal improvements and education, but opponents of the Bank had concerns that centered on the fear that the Bank had become a device through which political objectives were promoted. Both parties were packing the Banks' Board of Directors with members of their respective parties via the spoils system. Though the motivation of internal improvements for the state[19] seems to be in the public interest category, the fact that the legislators were (1) not mutually exclusive to bankers and (2) using these banks to achieve their own agendas suggests both the leviathan and private interest motives for intervention. In this case, these motives may have been indistinguishable.

Not all state administrations viewed having the Bank at their disposals as a good thing. Various governors from the late 1840s through 1860 called for a review of the Bank or an outright liquidation of it. Among the more adamant opponents of the Bank was Governor Andrew Johnson, who consistently recommended its liquidation throughout his governorship, 1853-1857. Although Johnson was not alone in his opposition to the Bank, it survived until 1869. As noted earlier, the incumbent party alternated a great deal between the Whigs and the Democrats. However, the anti-bank Democrats were not able to close the Union Bank, the Planters Bank nor the Bank of

[19] Internal improvements constituted things such as schools, roads, canals, etc., i.e. improvements for the state's infrastructure.

Tennessee in Nashville for the rest of the antebellum period. The separation between legislator and banker was never great enough to spur an elimination of the state-sponsored banks.

As evidenced by figure 2.7, little entry occurred into the Tennessee banking sector during the antebellum period until 1853. In 1852, Tennessee passed a free banking law. Although the free banking law eased the barriers to entry, this law required that three-fourths of the bonds used to back circulation must be Tennessee state bonds, an indication of what the state congress perceived as the banks' role and a chance to increase its size and power by forcing banks to buy government debt. However, the law did not contain a market valuation restriction. This oversight in the free banking law fueled Johnson's crusade to destroy the state bank. It was rectified in 1856 when the legislature mandated that if the bonds backing any free bank fell below par in New York for thirty days, the bank must deposit additional bonds up to the market value necessary for backing its circulation. This action to decrease the risk for depositors suggests a public interest motive on the part of the legislators. Despite the number of banks that were erected under the free banking law, the state banks still dominated. Figure 2.8 illustrates the bank closings that occurred during the antebellum period in Tennessee. Most of the closings were banks established under the free banking law.

The Panic of 1857 caused the majority of bank failures that Tennessee experienced in this period. Figure 2.8 shows that 20 banks closed in the last 5 years of the antebellum period. As previously mentioned, the two large banks, Union and Planters, which survived the 1837 panic, and the Bank of Tennessee in Nashville endured the 1857 panic. In fact, these three banks formed the core of banking in the state for most of the

period. From 1830 to 1853, there were less than five banks open in each year in Tennessee. The free banking law, which had spawned an explosion of banks, also led to the opening of banks that were either inherently less stable than the larger state banks or, because they lacked protection from the legislature, appear to be less stable. In any event, the turbulent time that the banks experienced at the end of the period due to the Panic of 1857 is no doubt the reason why the highest odds of closing, in the four states, is observed for Tennessee (see chapter 3). Though the legislators paid a great deal of attention to the state banks, the free banks were subject to the whims of the market.

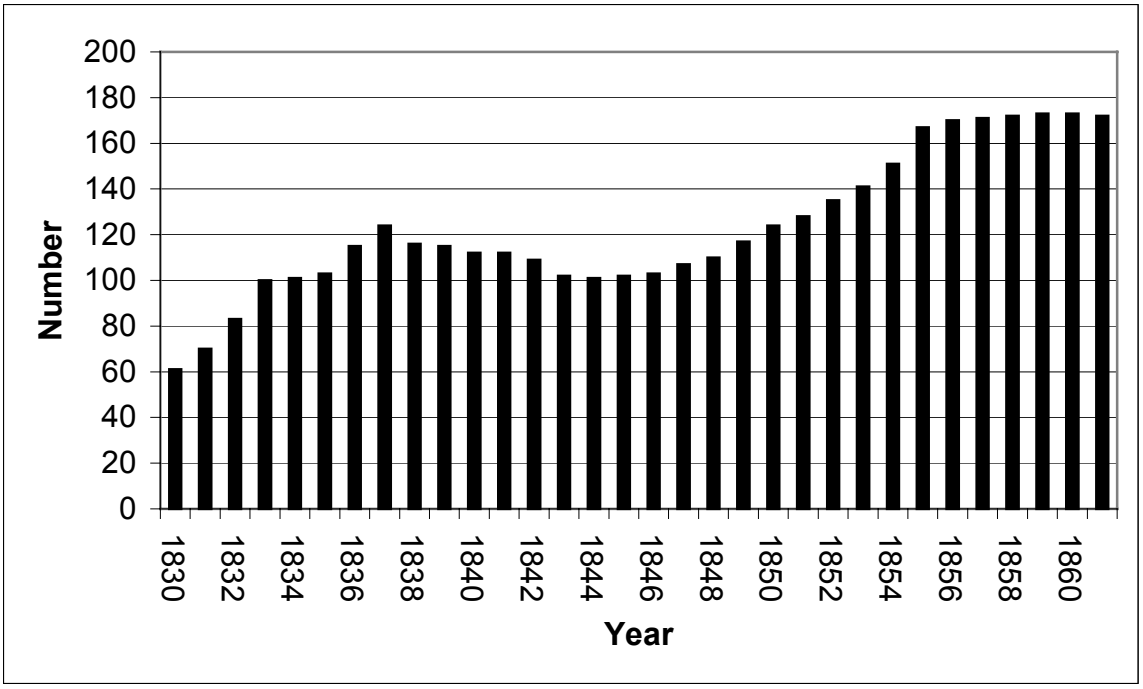
All of these closings occurred under a Democratic governor, Governor Harris[20] (1857-1862). However, it was not until 1860 that the Tennessee legislature passed a law in response to the closings. This law created a governor-appointed bank supervisor and stricter mandates on the amount of capital that had to be paid in specie. These mandates were more aligned with the way the legislature oversaw the state banks, presumably for both leviathan and public interest reasons. The onset of the Civil War, however, prevented any observable results from this law.

The fact that Tennessee experienced a great deal of change in its banking sector over the antebellum period is not surprising; this has been observed in the other three states. However, Tennessee's exact experience was not similar to any of the other states. A small, primarily state-controlled banking system dominated the state from 1830 until 1852, when the free banking law was passed. During this period, this period there is some evidence that the bankers had "captured" their regulators by mandating that charters be

[20] Interestingly, Gov. Harris, who led Tennessee into secession, was the state's only "Confederate Governor" and had to flee the state during the Civil War, served as a U.S. senator from 1877 until his death in 1897.

obtained by prospective bankers, a mandate that obviously limited the size, and competition, in the banking sector. There is also evidence that legislators were protecting their own interests by providing themselves with a central bank in 1839 and requiring banks to back their notes with state bonds. Throughout the period, the Democrats opted for placing more risk on the bankers, via personal liability clauses, which appears to be in the public's interest. However, the stricter these mandates, the greater the barriers to entry thus restricting the size of the banking sector. Whether this outcome was intended determines the motive, public or private interest, of the regulators. It was the Whigs who overturned the personal liability clause. Again, the outcome does not confirm the motive. The Whigs were usually businessmen so their motives in removing the personal liability clause would seem clear. However, they could contend that it was in the public's interest to maintain a banking sector by promoting the convenience of wealth holding and economic growth. What is apparent from Tennessee's experience is that motives for banking regulation were many and mutable.

Chapter 3 provides an empirical analysis to test the proposition that these states engaged in banking regulation that was better suited to their distinct environments than external regulation would have been. For convenience, table 2.1 provides a summary of the aforementioned major banking legislation for all four states.



Source for figures 2.1-2.8: http://research.mpls.frb.fed.us/research/economists/wewproj.html.

Figure 2.1: Total number of banks open in Massachusetts, by year

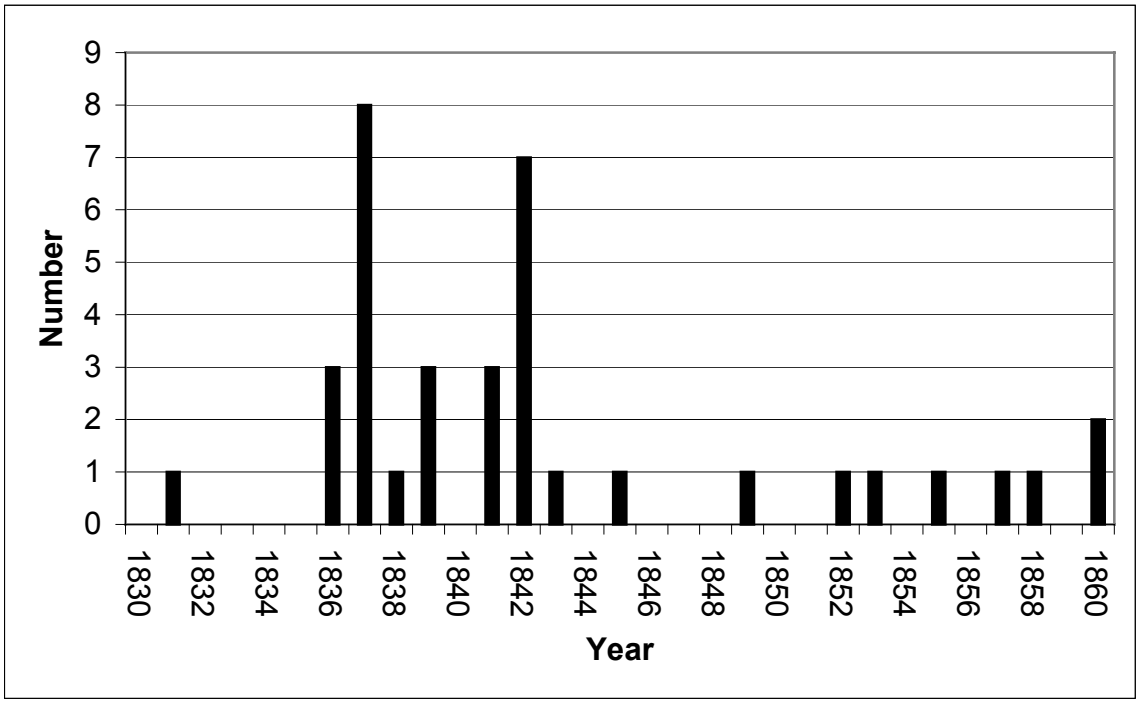


Figure 2.2: Total number of bank closings in Massachusetts, by year[21]

[21] See source for figure 2.1.

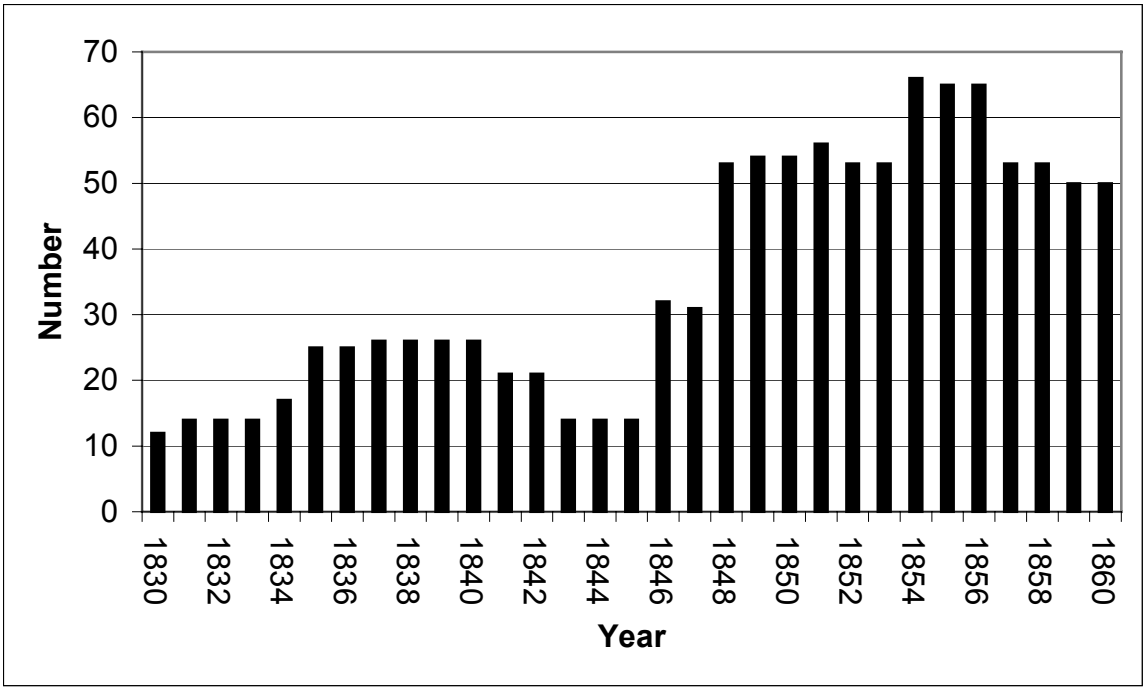


Figure 2.3: Total number of banks open in Ohio, by year[22]

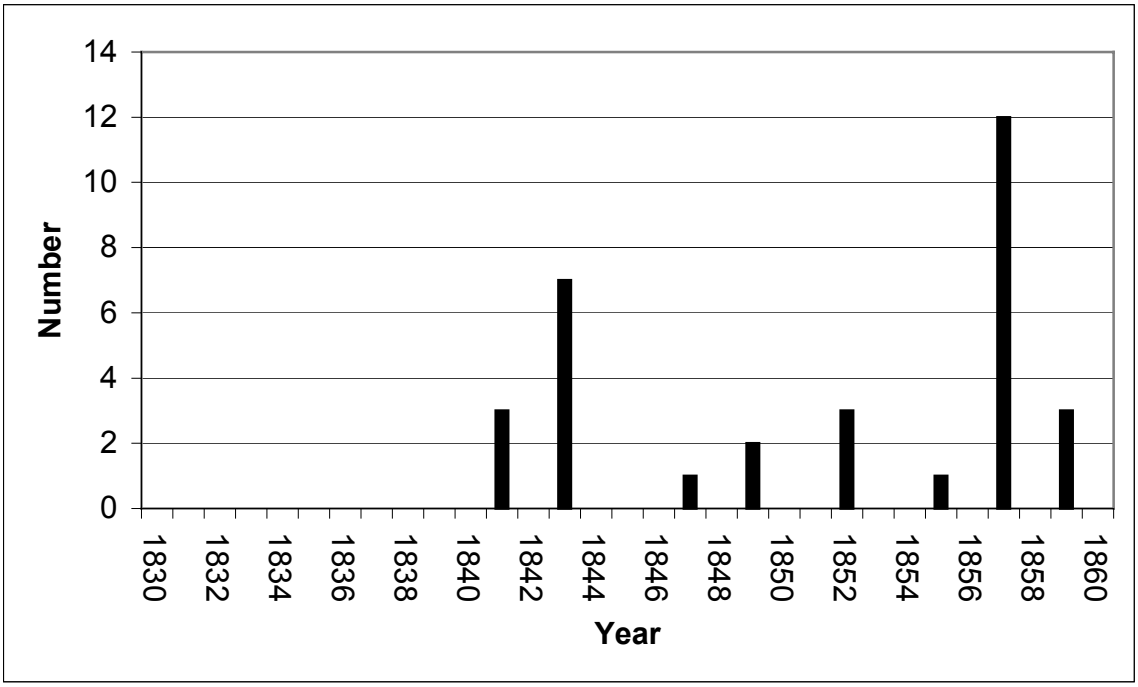


Figure 2.4: Total number of bank closings in Ohio, by year[15]

[22] See source for figure 2.1.

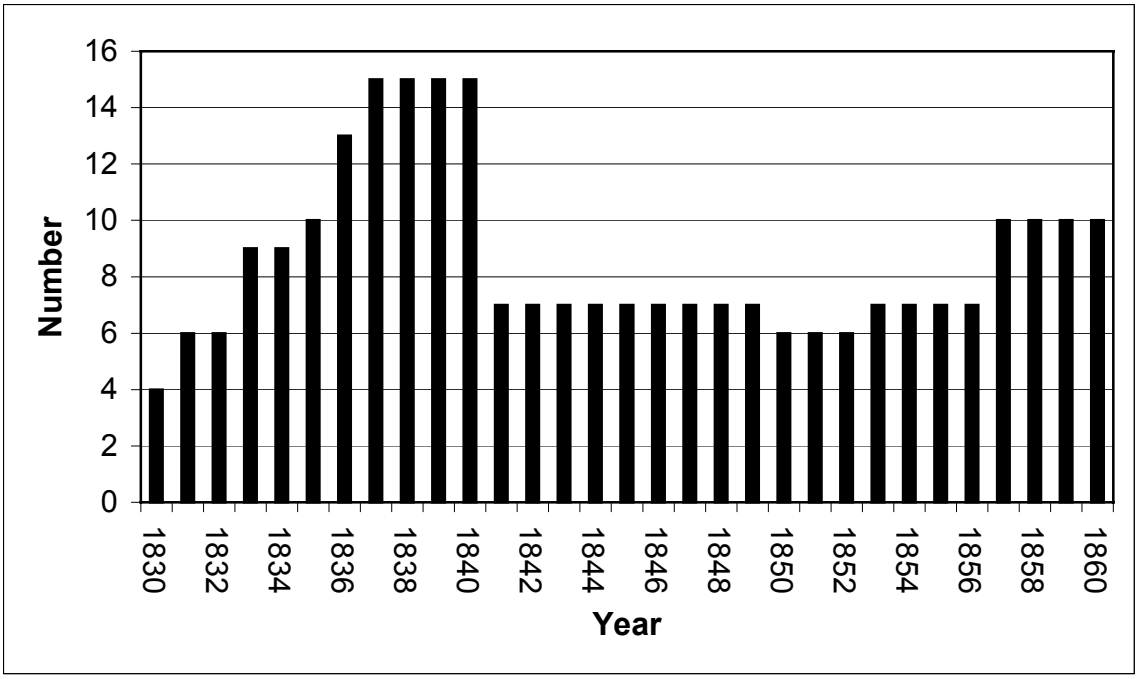


Figure 2.5: Total number of banks open in Louisiana, by year[23]

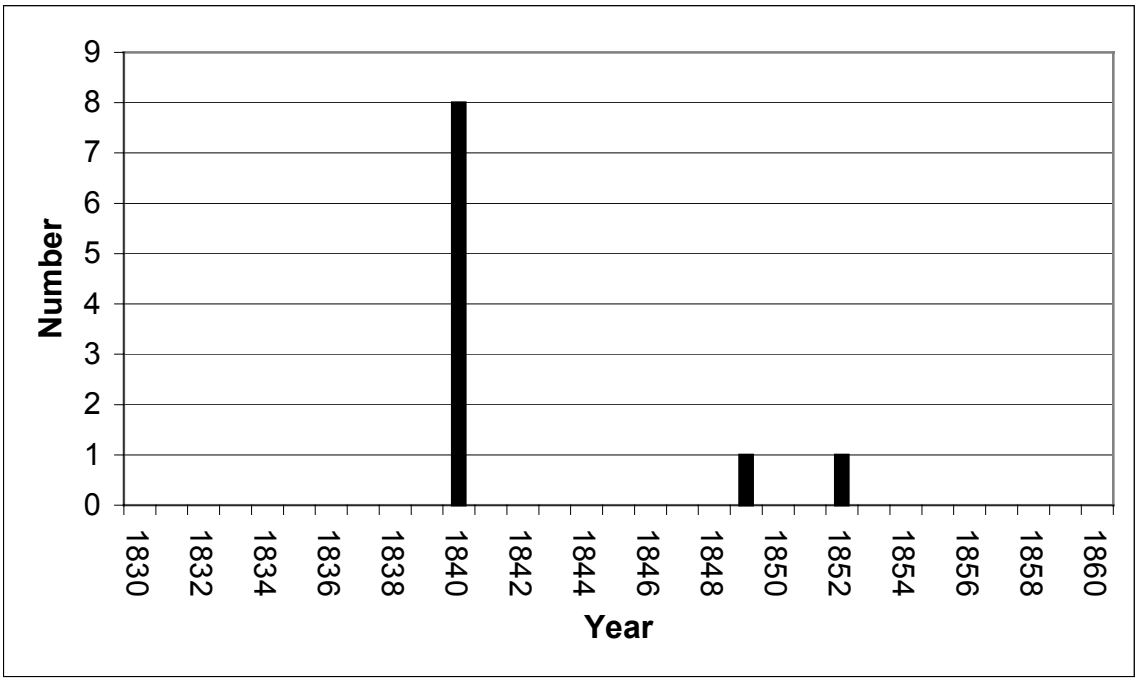


Figure 2.6: Total number of bank closings in Louisiana, by year[16]

[23] See source for figure 2.1.

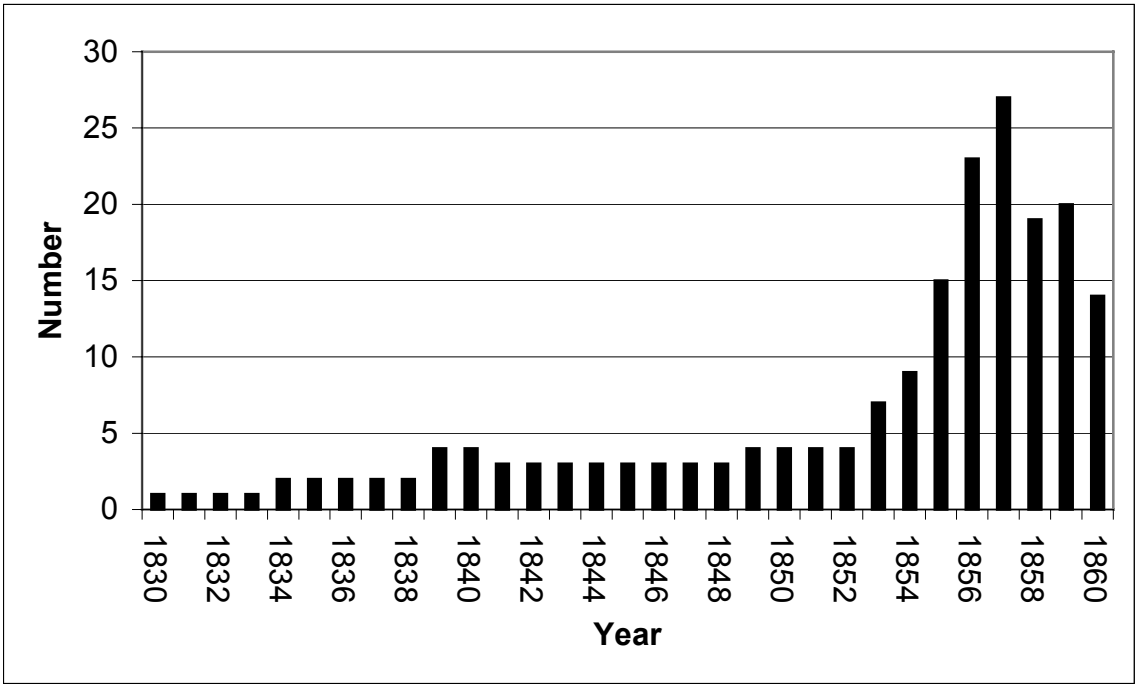


Figure 2.7: Total number of banks open in Tennessee, by year[24]

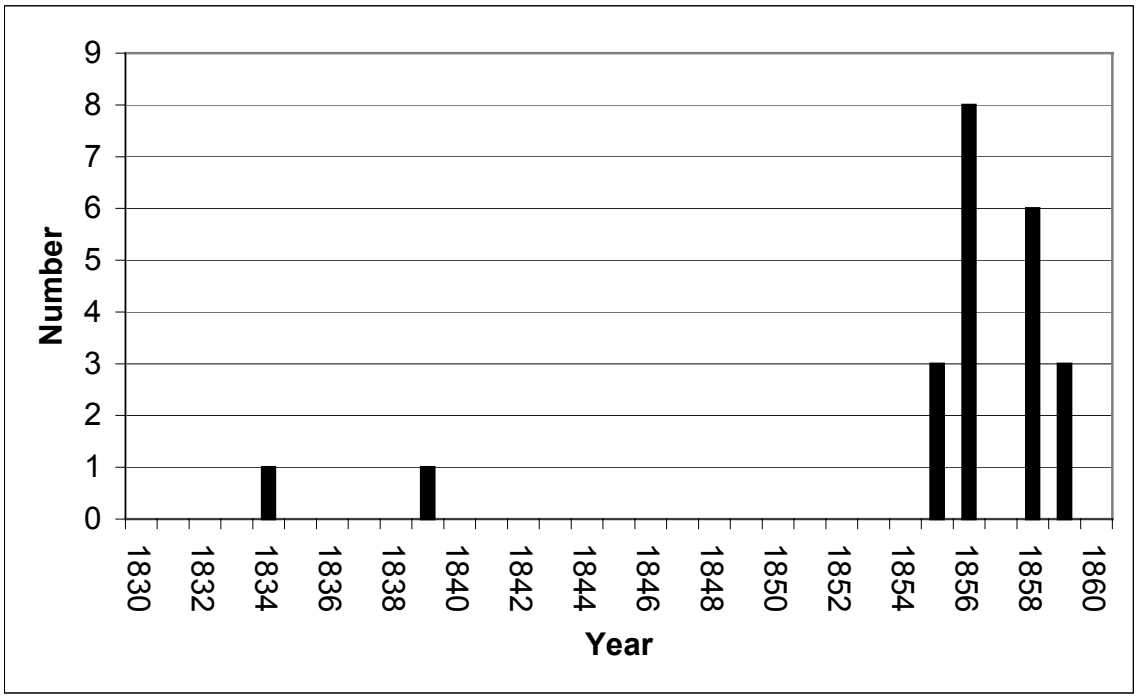


Figure 2.8: Total number of bank closings in Tennessee, by year[17]

[24] See source for figure 2.1.

Year	Massachusetts	Ohio	Louisiana	Tennessee
Pre-1830	Banking institutions must obtain charters			
1829	Banks required to keep half of paid-in capital in specie			
1835	Shareholders are personally liable for bank losses in proportion to their shareholding			
1837	PANIC OF 1837			
1838	Suspensions allowed until 1/1/1839; three bank commissioner positions created			
1839		Board of bank commissioners established to begin bank exams; banks required to pay notes in specie	Charter must be forfeited if a bank suspends even for a day	Bank of Tennessee established as the state's central bank
1840	Number of proxy votes by directors or bank officers limited to 10			
1842		To prevent charter expiration, new law restricts bank powers, taxes capital and circulation and holds executives personally liable for losses.	Mandates reserves on circulation and deposits, provides enforcement of law preventing suspensions	
1843	Board of Commissioners disbanded; stockholders begin bank investigation with a vote of one-eighth of shareholders			
1844		Wooster Bank Bill protects the Bank of Wooster and four others from their charters expiring until 1850.		
1845		State Bank of Ohio established (with a safety fund) and a system of independent banks.	New state constitution prohibits any new banking corporations	

Table 2.1: Major banking legislation (continues)

Table 2.1 (continued)

1851	Free Banking Act; three bank commissioners positions created; vote of 5 stockholders needed to instigate an investigation of bank	Free Banking Act		
1852	Amends 1851 law so that circulation cannot exceed capital stock		New state constitution allows for special acts to create banks but does not permit state backing	Free Banking Act
1853			Free Banking Act	
1854		Attorney General interprets new state constitution as forbidding any new banks		
1855			New version of Free Banking Act passed (with rewording only)	
1856		Ohio Supreme Court determines free banking is allowed		Market valuation restriction added to free banking law
1857	PANIC OF 1857			
1859	The bank commissioners must verify that capital is actually paid in			
1860				Tougher capital requirements passed and bank supervisor established

Sources: Compiled from *The Revised Statues of the Commonwealth of Massachusetts*, specified years; *Statues of the State of Ohio of a General Nature*, specified years; *The Revised Statues of Louisiana*, specified years; and, *The Statue Laws of the State of Tennessee of a Public and General Nature,* specified years.

CHAPTER 3

EMPIRICAL EVIDENCE OF BANK PERFORMANCE

3.1 Data description and methodology

The aim of this project is to develop a methodology to assess banks performance under different regulatory regimes. The conceptual models provide a guide to expectations of regulatory change, i.e. the changing relative importance of the different agents' objectives is reflected in the development of observed regulation. This foundation does not lead to an obvious method of evaluating bank performance. However, the background information regarding variance in the evolution of state economies, state banking sectors and state regulatory regimes indicates that optimal state banking regulation is likely to be idiosyncratic to the state as well. Hence, this research tests to see if banking regulations that the states enacted were suited to their specific needs and, therefore better with respect to the maintenance of a banking sector than external or non-state regulations. Testing this hypothesis is problematic. One possible method is to construct a spatial counterfactual that illustrates the impact on the odds of a bank closing under the bank's own state laws and compare it to the odds under the regulation of other states.

To accomplish this task, a duration model for discrete time that estimates the impact on the odds that a bank closes due to the explanatory variables is employed.

Duration analysis incorporates the important aspects of time and space by accounting for the impacts of differing local conditions over time. In this setting, the duration model is used to show how local conditions, including regulation, impact the length of a bank's "life" under varying economic and regulatory conditions. For discrete-time models, such as this, the duration model is simply a logit that is performed on data that has been converted to, in this case, bank-years. The form of this model is

$$P(y_{it} = 1) = F(\alpha + \beta_1 X_{1it-1} + \beta_2 X_{2it-1}) \quad (1)$$

where $y_{it} = 1$ if the bank fails in time t, X_{1it} is a matrix of bank *i* characteristics in time *t*, and X_{2it} is a matrix of time-*t* characteristics of the state in which bank *i* is located. Due to the annualized nature of the data, the dependent variable is regressed on the previous year's characteristics. Hence, if a bank fails in time *t*, the corresponding independent variable data are from *t*-1. It is important to keep in mind that it is the covariates at the time of measurement that are affecting the dependant variable, which is observed in the next period.

Given the focus of this analysis, I have selected a specific time period to collect data. The period of interest is the antebellum period, which encompasses the free banking period 1837 – 1860. However, the late 1830s saw a great deal of financial turmoil due to the Panic of 1837; therefore, it makes sense to include this decade in the model and begin

the sample period in 1830.[25] Because this paper focuses on the performance of banks and not the impact of the Civil War, the sample period ends in 1860.

The dependent variable, which measures bank failure, is itself not available for all banks. Some banks are liquidated but do not result in losses to noteholders. Others fail outright and are unable to pay back the depositors. However, the cessation of bank operations is observable. Although this is an imperfect correspondence, my premise relies on the fact that banks are positive contributors to economic growth, especially in developing economies. Therefore, the dependent variable used in this analysis equals one when a bank closes and zero when it remains open.

The matrix X_{1it} is composed of variables reflecting an individual bank's operations and specific characteristics, such as levels of risk-taking and institutional capital. These variables are an indication of not only how well a bank is operating but also how well it may be able to handle economic shocks. Consistent with the model employed by Wheelock and Wilson (1995) for the examination of bank failures during the Great Depression, the source of the X_{1it} variables is the balance sheets of antebellum banks in the four states in this analysis. The balance sheet data have been provided by Warren Weber (Weber 1999). These data contain a large amount of information; however, there are many instances of missing data for the states other than Massachusetts. For bank identification, the data have taken into account any name changes, but there is not an explicit record of any mergers. As a summary, table 3.1 includes the number of banks in each state and the number that closed for the entire

[25] The Second Bank of the United States closed in 1836 and there was a severe financial panic in 1837.

period. This table also includes these data for small banks and large banks[26] in each state for the period. The amount of deposits, though a useful indicator of activity, is not available for all four states. However, other balance sheet items indicate the ability of banks to withstand shocks. These balance sheet data include annual levels of capital, assets, and specie. The amount of circulation that a bank has issued relative to its specie, in which notes are payable, is a measure of risk-taking by the bank. Using these balance sheet items, I construct the circulation ratio (note circulation:specie) to reflect a portion of a bank's risk and potential exposure to shocks. As confirmed many times in chapter 2, suspension of payment in specie was the first outcome of a financial shock. Additionally, the level of capital (in thousands of dollars) is included to represent the fiscal foundation of the bank. Assets are included to account for bank size. Greater circulation ratios are associated with riskier behavior, whereas higher capital levels and assets indicate that a bank is less susceptible to failing. Therefore, the circulation ratio is theorized to have a positive impact on the odds of a bank failing, while the other two coefficients are expected to be negative.

The last bank-specific variable used is the age of the bank, which is a measure of the bank's institutional capital. This variable controls for the unobserved differences between banks, including experience with unanticipated negative shocks and other forms of bank specific attributes. Massachusetts is the oldest of the states and, consequently, has the oldest banks. This variable tests whether the inclusion of Massachusetts with younger

[26] As defined earlier, "small banks" are banks with less than $1million in capital and "large banks" are those with $1 million or more. This separation of banks is used for different specifications of the duration model.

states gives the former an advantage in bank operations. Given that institutional capital is more likely to help the performance of the bank rather than hurt it, the sign of the coefficient for age is expected to be negative.

The matrix X_{2it} is composed of variables reflecting the local environment in which bank operated. These include bank regulation, supervision of banks, business cycles, financial panics, competition, and politics. Each of these variables is measured at the state level. These variables are not readily available and some prove difficult to measure. Regardless, they are important contributors to the ability for banks to remain in operation.

As we have seen in chapter 2, there are many aspects of the banking system that legislators regulated. Therefore, quantifying regulation for the empirical model is challenging. Regulations such as maximum circulation ratios and minimum capital requirements are already quantified and so can be used as a measure of prudential regulation. Capital requirements are unreliable as a source for regulation as it is well documented that banks often held much less paid-in capital than total capital subscribed (Dewey 1910). Therefore, the regulation measurement I employ is the circulation-to-specie ratio. Legislators paid a great deal of attention to this ratio and consistently regulated it, making it an appropriate candidate for the regulation variable. However, at the beginning of each period, each state had established only chartered banks. The circulation and capital demands made on the banks, if any, were contained in the charters. As noted in section two, each of the four states began enacting regulations applicable to all banks shortly into the antebellum period. The most permissive regulation within each

state, over the period, is used as the regulation for banks open in the early years of the period. Any bias created using this measurement of regulation puts downward pressure on the odds of bank failure.

The supervision of banks is a more difficult aspect to take into account. Mitchener (2002) uses a measure of bank supervisors' actual powers, such as their ability to liquidate banks and their term lengths, for studying bank failures during the Great Depression. Comparable documents of supervision during the antebellum period have not been found. As this research is primarily concerned with the impact of regulation, supervision has not received the rigorous treatment that is provided by Mitchener. Of course, supervision and regulation are necessary complements in the assessment of banking oversight. This task is an obvious subject for future research. In this dissertation, the balance sheet data are used to try to capture the supervision of banks by states. Specifically, the minimum capital observed across banks within each year in each state illustrates the intensity of the enforcement of the law, while simultaneously demonstrating the behavior of banks within this regulatory regime.

The other covariates control for local conditions affecting the odds of bank closing. The amount of competition that a bank faces certainly plays a role in its ability to remain open. The per capita number of banks, or the bank density, in the state is used to measure competition and it is conjectured to have a positive effect on the probability of bank closing. Empirically, this variable is the number of banks open in a year per 1000 white males residing in the bank's state. The annual white male population was

constructed from census data using estimated exponential trends between the 1830, 1840, 1850 and 1860 white male populations in each state.[27]

The occurrence of a national financial panic also impacts bank survivability. The practical problem of constructing a dummy variable that indicates the existence of a panic is the difficulty in assessing how long, if at all, the panic's impacts last after the first year. The effects of the Panic of 1837 are somewhat indistinguishable from the subsequent recession, which lasted through the early 1840s. Rather than estimating the number of years a panic affected each state's economy, a variable containing the number of years since the last panic is used. The backward-looking nature of this variable is appropriate given that the contemporaries did not have the benefit of our hindsight in knowing when these events would occur. Financial panics impede the ability for any bank to continue profitable operations, but the effects of such a shock generally dissipate over time, if not disappear. The further away in time that a bank is from a temporary shock, such as a panic, the less likely it will be to close because of that shock. Hence, this variable should negatively impact the odds of closing.

The linear nature of this variable used to capture the effects of panics may seem somewhat restrictive but it circumvents the trouble of choosing whether the panics' effects eroded at an increasing or a decreasing rate. In the case of the Panic of 1837, the effects seemed to have been longer lasting (and more severe) than those of the Panic of 1857. Using this superficial observation as the basis of a variable, though possible, would yield a complex variable that would be even more arbitrary than a linear one. Indeed, the results show that this simple solution does perform well.

[27] Appendix A details the construction of this variable.

As noted throughout chapter 2, local political conditions are important indicators of the regulatory atmosphere because politicians set the regulatory agenda. In the present analysis, the model uses a dummy variable of the governor's political party, which equals one in years when the governor is a Whig[28] and zero otherwise. The party that was less amenable to local banks may have instituted policies and procedures to put them out of business. Although the Whig party did not have an explicit or written platform, it was formed as a reaction against President Jackson, notorious for his war against the BUS 2, and primarily composed of businessmen. In chapter 2 there are many examples of the Democratic party proposing the "locofoco principle" of making bank officials personally liable for depositors' losses. Legislation such as this, obviously, did not support maintenance of the banking sector. Hence, the sign on the variable is conjectured to be negative as Whigs may have had a more vested interest in supporting a banking system, i.e. keeping banks open.

The last variable included controls for local economic conditions. For this variable, a basket of goods that constitutes a simple majority of each state's production is constructed, as determined from decennial census data of 1840, 1850 and 1860.[29] Though the items in the production bundles stay the same, the relative weight of each item changes according to the census report. For instance, in the case of Tennessee, the 1840 census provides the weights for the production bundle over the period 1830-1840; the 1850 census provides the weights for 1841-1850; and, the 1860 census provides the weights for 1851-1860. The weights are multiplied by the prices of these goods in the city

[28] Also receiving a 1 for this dummy variable were Clay Whigs and National Republicans in Ohio, and Adams Republicans in Massachusetts at the beginning of the period as well as the Know-Nothings and Republicans in Massachusetts and Ohio at the end of the period.
[29] Only the 1840 and 1860 censuses were used to construct Massachusetts's and Ohio's production baskets.

closest to or in each state, found in Cole (1938), to compute the value of the weighted basket for each year. These values were adjusted for inflation with Warren and Pearson's indices (Warren 1933). The inflation-adjusted values were indexed and then a linear trend was estimated for each subperiod. In order to make the indices comparable across states, the variable included in the model is the percentage deviation of the computed index value from its linear trend. The greater this number is, the better economic conditions that the state is experiencing, i.e the higher its production value. Therefore, the sign on this variable is hypothesized to be negative because better economic conditions decrease the odds of bank closings.[30]

For convenience, the variable names of the aforementioned covariates used in the empirical model are summarized in table 3.2. Additionally, summary statistics for all of these variables are reported by state in table 3.3. This provides an idea of the actual magnitudes of the variables being used. Summary statistics are also reported by size of bank in table 3.4, which shows the differences between the large and the small banks with respect to these variables.

3.2 Results of the duration model

Table 3.5 shows the results of the logit model of four specifications. Models I and II are pooled models, using data from all the states. Models III and IV are also pooled models but using only banks with less than $1 million dollars of subscribed capital or

[30] The details of the construction of this variable are in Appendix B.

small banks.[31] In all four models, the legal maximum circulation ratio variable (*LCIRC*) is used as the regulation variable. In addition to *LCIRC*, models II and IV include the lowest observed capital across banks within a state for the year (*SCAPT*) as a measure of supervision.

The circulation-to-specie ratio (*CIRC*) is positive and significant for all four specifications, as expected, suggesting that the higher the circulation ratio is for a bank in a given year, the greater the odds of closing. The level of capital (*CAPT*) is only significant in the pooled models and it does have the expected negative sign in these models. Bank density (*BDENS*) and the number of years since the last financial panic (*PANYRS*) are significant with the expected sign. *BDENS* proxies for competition, thus increased competition increases the odds of closing. The negative sign on the coefficient for *PANYRS* implies that the further away, in time, a bank is from the last panic, the less likely it is to close. The state dummy variables are all significant illustrating that these three states all exhibit significantly higher odds of bank closing than Massachusetts. Pairwise comparisons between the state dummy variables indicate that the odds are significantly different for Tennessee from the other three states but are not significantly different between Ohio and Louisiana odds. Indeed, being in Tennessee is the largest contributor to the odds of bank failure of all the explanatory variables.

The regulation variable, *LCIRC*, is positive and significant in all specifications. This result indicates that the greater the legal maximum circulation ratio is, the higher the odds of closing. This is an expected result because the less reserves a bank maintains, the

[31] These specifications were also estimated using the banks with over $1 million in capital (large) and those with $500,000 or more but less than $1 million in capital (medium). However, for these models, the maximum likelihood estimation does not converge.

greater the possibility that it will not be able to redeem its notes at a given time and consequently be forced to cease operations. The supervision variable, *SCAPT*, is negative and significant but only for the small banks (model IV). This is not surprising either, as the banks with lower capital are naturally the institutions impacted by the supervision of capital requirements. These estimates indicate that stricter regulations (i.e. higher circulation ratios) and, in the case of model IV, stricter supervision (i.e. maintenance of higher capital levels) lower the odds of closing. This may be expected if the regulation imposed is intended by the regulators to remove weaker banks. A hypothesis of this dissertation is not that regulations were not binding or did not influence the banking sector. Clearly, these regulations generated observable impacts on the banking sector for their states. The issue is whether these state-mandated interventions in the market were the best regulation for each state, or better than the alternatives, which is the impetus behind the construction of the counterfactual in sections 3.3 and 3.4.

The variable *ASSETS* is among those that are not significant for models I and II. It was, however, weakly significant for the small bank models III and IV. The surprising thing is that the variable is positive. This indicates that the higher the level of assets a small bank owned, the higher its odds of closing. It is a perplexing proposition as one would think that a bank's assets would provide a "cushion" should it encounter trouble that might prompt it to close. An investigation into the portfolio of the types of assets the small banks held could provide the answer. This inquiry may be fruitful area for further research.

The level of a bank's capital, *CAPT*, does not turn up significant in models III and IV but, as mentioned above, is significant and negative in the pooled models I and II. The

division between small and large banks is based on the level of capital a bank held. Therefore, it can be expected that when the banks with small-capital banks are grouped together, the level of capital they hold is no longer a useful predictor of their ability to remain in operation.

The variable to assess the impact of local political conditions, *POL*, is not significant in any of the specifications. The main reason for this may be the variable's level of aggregation. The political party of the governor, perhaps, does not reveal precisely enough the nature of the politicians actually enacting regulation. A variable that captures the composition of the state legislature in each year may contribute a more accurate picture of the local political environment. Though a good possible alternative, the construction of such a variable would be very labor-intensive. The return on this labor might not be too great because the manner in which elections were carried out in practice was very different than in theory, despite the large increases in voter turnout during the antebellum period. Kenneth Winkle presents an in-depth picture of what polling practices were actually like in antebellum Ohio (Winkle 1994).

The last two variables that fail to be significant in any of the model specifications are *DEV*, the measure of local economic conditions, and *AGE*, the measure of institutional capital. The economic indicator, *DEV*, may not influence the odds of bank closing because it does not include enough of each state's production or it may be that the data used is not as accurate as one would like. For the computing of this variable, several different data sources from the antebellum period were used. It is possible that by using these to construct one variable, the inaccuracies in each source are compounded leaving a rather questionable depiction of the states' economies. As for the *AGE* variable, as noted

in chapter 2, Lamoreaux (1986) shows that new bankers were quite successful competitors to their older counterparts. By being non-significant, the estimated coefficient on this variable supports the comparability between Massachusetts and the three younger states.

3.3 Results of the counterfactual for the antebellum period

To evaluate alternative regulation regimes, a fictional "average bank" from each state with mean characteristics is constructed. Table 3.6 reports the odds of closing for banks from different states under their own regulation and under that of the other states, computed using the average bank and the estimates from model I. These results show that the predicted odds of the average Massachusetts bank closing were 0.58%. However, if the average Massachusetts bank had been regulated by Ohio law, instead of Massachusetts law, its odds of closing would have increased by 5.27%.[32] This is modest compared to the figures for Tennessee. The marginal effect of the average Tennessee bank switching from Tennessee to Ohio regulation would be an increase in the odds of the average Tennessee bank closing by 60.8%. The similar impact of Louisiana law would have been a 42.5% increase in the odds. Additionally, the marginal impact of Ohio banks having Louisiana law is small but significant and positive, indicating that Ohio banks were better off, with respect to their odds of closing, under their own law.

Using model III in table 3.6, the same analysis is conducted for the "average small bank" in each state. The results are approximately the same in terms of the signs and relative magnitude of effect except for Louisiana banks. In the first scenario, i.e. the

[32] This figure, which is only significant at about the 15% level, is in the second section of table 3.5 in the (OH, MA) cell.

average bank and estimates from model I, the marginal effect on the odds of the average Louisiana bank closing under Ohio law would have been an insignificant 0.71%; whereas, these odds, using the average small bank and model III, would have significantly increased by 5.6%. Even more startling is the large negative impact on the odds of the average small Louisiana bank closing if it had been under Massachusetts law (-10.8%) or Tennessee law (-11.7%). However, these results are not very reliable because there are only 5 small banks in Louisiana so the results for the "average small bank" in this state are not very informative.

Tennessee, on the other hand, established mostly small banks. The odds of closing if the average small bank in Tennessee had been under the laws of the other states would have been even greater than with model I. In this case, even Massachusetts law would have had a significant impact on the odds of Tennessee banks closing. Also, this small bank specification indicates that the odds are much greater of the average Tennessee small bank closing in Tennessee at 13% versus 6.34% using model I.[33] Even though Tennessee regulations were very restrictive,[34] any of the alternative regulations from the other three states would have increased the odds of bank closing in Tennessee.

As seen by the fourth set of results in table 3.6, examining the small average banks using model I yields similar results to the small banks under model III, although some of the marginal effects are not significant. The fifth, and last, set of results in table 3.6 reports the results from performing the counterfactual using model I and the average large bank in each state. This specification generates results that are closer to zero than those using the average bank and model I, with the exception of the significant, negative

[33] From the top of table 3.6.
[34] Table 3.3 shows that Tennessee had the lowest of the legally-permitted maximum circulation ratios at 2.

values for the average large Ohio bank with Massachusetts law (-0.76%) or Tennessee laws (-0.85%). Similar to the case of small Louisiana banks, the difficulty in interpreting the large bank results lies in the few number of large banks, especially in Ohio and Tennessee. However, the same general pattern is observed with respect to the signs of the results for each specification but there are differences in the significance of some of the impacts.

Noticeably, not all regime changes increased the odds of closing. In all four specifications in table 3.6, there are negative impacts on the odds of closing if (1) Massachusetts banks had been under Tennessee laws, (2) Ohio banks had been under Massachusetts or Tennessee laws and (3) Louisiana banks had been under Massachusetts or Tennessee laws. The negative signs indicate that a state may have been able to do better in maintaining a banking system if it had employed the laws of another state. For Louisiana, the negative results are significant in all scenarios except for large banks using model I. As will be discussed in section 3.4.3, the results for Louisiana are puzzling and stem from a number of reasons. A primary concern is that the regulation variable, the circulation ratio, may be too narrow a measure to gauge the full impact of the different regulatory environments. Figure 3.1 illustrates the percentage change in the odds of closing when switching from a bank's own-state law to that of another using the results for the average bank under model I. Although there is an improvement in the odds of closing under Massachusetts law for two of the three states and under Tennessee law for all three states, it is only a significant decrease for Louisiana banks.

For the average small bank, using model III, all of the negative values are significant. Tennessee's restrictive circulation ratio would have decreased the odds of

closing in all three other states. Massachusetts law would have decreased the odds of closing in Ohio and Louisiana. Here, the same problem with the regulation variable coupled with the inclusion of only small banks, which were particularly affected by reserve requirements. Results for the average small bank, using model I, are similar though Massachusetts law does not affect the closing odds for Ohio banks. For the average large bank, using model I, there are simply too few large banks to believe these results. While there are a few significant impacts, the results are reported only for completeness and are not a very credible depiction of banking during this period.

Louisiana had a system composed mostly of large banks. Over a third of the large banks closed in the period and over half of the small ones did. This is indicated in table 3.6 as the odds of large Louisiana banks closing is about 1% and the small banks have a 13.3% chance of closing. The discrepancy is also illuminated in the counterfactuals of Louisiana banks existing under other laws. For large banks, the marginal impact of having Massachusetts or Tennessee laws would have been almost –1%, meaning that the odds of closing would have decreased had Louisiana large banks been under these regulations. The impact of Louisiana adopting Ohio laws is positive but even less, in absolute value, at 0.6%. Again, these negative numbers are contrary to the hypothesis but all of these impacts for large banks are very small, lack significance and are not very credible.

For the few small Louisiana banks, the direction of impact on moving to another state follows the same pattern as the large banks, under the pooled model, with respect to the direction of impact. However, the magnitudes are much larger with –11% and –12% impact under Massachusetts and Tennessee laws, respectively, and 5.7% under Ohio

laws. These magnitudes are approximately the same when using model III. Louisiana was not providing the best regulation for its small banks. The Massachusetts impact may be due to its greater number of small banks and so its legislators provided well for small banks. However, one must keep in mind that there were only 5 small banks in Louisiana.

Ohio had mostly small banks even after it established the State Banking system with a safety fund. There were only 3 banks with $1 million or more in capital over the period. Yet, even for the small banks, the marginal effects of Ohio banks under laws of the other states are the smallest but significant. This is surprising as Ohio was the only state that completely changed its banking system during the period, indicating that its laws were especially furnished for Ohio banks. Instead, the effects would have been negative and small, half a percent or less, for Massachusetts and Tennessee laws under the pooled model. The effect of using Louisiana laws would have been small, 2.3%, but positive and significant. These results do not change in sign or magnitude under the model III or using small banks in model I but the decrease in the odds that Massachusetts law would have rendered is no longer significant. When using large banks, of which there were very few in Ohio, the positive effect from using Louisiana laws would become even smaller. The negative effects of adopting the laws of the other two states would still be negative but larger than for the small banks. However, the effects of Massachusetts and Tennessee laws would still be less than 1%. The small differences in the impact of Ohio laws versus those of other states may be a product of the different types of banks in Ohio. After 1845, Ohio had state bank branches and independent banks, and free banks after

1851. Because Ohio used different regulations for each type of bank, the current method of using the "average" bank may be suppressing the differences between Ohio's laws and those of the other states.

Out of the 208 banks in Massachusetts over the period, only 16 of them were large, as defined here. None of the large banks closed. Relative to the other states, a small percentage of all Massachusetts banks closed. This is evident in figure 2.1, which shows a positive general trend in the number of banks after 1844. Massachusetts banks struggled during the Panic of 1837 and the 1840s recession but had few problems in the late 1850s. Table 3.6 shows that the chances a Massachusetts banks had of closing were between 0.2% for large banks and 0.63% for small ones. Because these odds are so low, the 3.1% increase in the odds of closing if a small Massachusetts bank, using model III, had been under Louisiana law is a large marginal effect. Tennessee laws would have lowered the odds that a Massachusetts bank closes, as they do for all the other states, regardless of bank size or model specification, although all of the Tennessee impacts are significant in this case. Again, this indicates that Tennessee had very good laws for supporting a banking system. If the large banks of Massachusetts had had Ohio or Louisiana laws, the odds may have still increased but the effects are not significant. The only significant effect would have been the impact of Tennessee law, which is negative but smaller, in absolute value, than the impact on small banks. There is evidence that Massachusetts's laws were better-suited to supporting its specific banking system than those of Ohio and Louisiana.

3.4 Results of the counterfactual by subperiod

Even more telling are the results of performing this counterfactual for six subperiods, instead of over the entire period as in the previous section. The average bank in each state for each of six subperiods[35] is constructed and then the same exercise of imposing the regulation of the other states is executed. This provides a pattern of how the odds of closing are affected over time under different regulations. To construct these counterfactuals, model I estimates are again used. The results are reported in table 3.7 and illustrated in figures 3.2 through 3.6. The point of comparison with the odds ratio for the entire period is with those in table 3.6 for the average bank and the pooled model (model I). Indeed, the subperiods show a more detailed picture, throughout the period, of how the odds of closing changed within the states under their own regulation and what would have happened to these odds if the states had adopted the regulation of one another.

From table 3.6, the odds for the entire period are the smallest for Massachusetts (0.58%) and largest for Tennessee (6.3%). Ohio and Louisiana fall in between these two at 0.73% and 1.4%, respectively. Figure 3.2 illustrates the odds of a bank closing in each state in each of the six subperiods under its own law. The temporal breakdown shows that this ordinal ranking only holds for the subperiods 1846-1850 and 1856-1860. It nearly holds for the subperiod 1851-1855 except that Louisiana's odds were slightly higher than Ohio's odds. The ordinal ranking of the odds changed quite a bit from the first half of the period to the second.

[35] The subperiods are: 1830-1835, 1836-1840, 1841-1845, 1846-1850, 1851-1855, 1856-1860

In the first subperiod, Louisiana had the smallest odds of closing, almost zero. Tennessee had the highest but this is still less than 2%. However, in the second subperiod, 1836-1840, the odds for all four states increased significantly. Ohio had the lowest odds in this subperiod at 2.1%. This is not surprising as this period encompassed the Panic of 1837, which was a severe national panic. In the subperiod 1841-1845, the odds for all four states fell such that Ohio's odds, 2.3%, were the only ones that are greater than 1%. In fact, Louisiana and Tennessee odds were no longer significantly different from zero in this subperiod.

For the last half of the period Tennessee had the highest odds of closing while Massachusetts had the lowest odds. However, the relative magnitude of the odds is very different in these subperiods than it is for the overall period, especially for Tennessee. It is apparent that the Tennessee odds were so high for the period because of the last subperiod where the odds climbed to 13%. None of the other states ever have significant odds above even 5% in any of the subperiods. It is helpful to examine the results from each state individually in order to acquire a clearer picture of what was occurring over time.

3.4.1 Results by subperiod for Massachusetts

The results from completing the counterfactual for all four states by subperiod are reported in table 3.7. As expected, the highest odds of closing, 2.6%, for the average Massachusetts bank occurred in the subperiod 1836-1840. This is expected because, as illustrated by figure 2.2, most of the closings that occurred in Massachusetts did so during this period because of the Panic of 1837. In the other subperiods, the Massachusetts odds

of closing fall very near that of the entire period, 0.58%, never going above 0.88% or below 0.22%. It is clear from figure 3.2 that the odds in the subperiod of the late 1830s were distinctly higher than the others. However, the really noticeable aspect of the Massachusetts odds over the subperiods is that they were decreasing after this until the last subperiod, where there is a slight increase. This indicates that Massachusetts had "corrected" its regulation after experiencing the shock of the Panic; thus Massachusetts's regulators were able to significantly reduce the odds of bank closings. Though the empirical analysis only considers the circulation ratio as regulation, there were other changes that Massachusetts made in its regulatory structure in the early 1840s that attempted to promote the public's welfare. This was apparently a policy that was well suited to Massachusetts as evidenced by the few failures that occurred post-1844. The increased level of competition experienced by Massachusetts may not have been as well suited to the other states, especially Tennessee, because the smaller banks were much more likely to fail in those states.

This improvement in Massachusetts's law is further supported by the subperiod counterfactual. Figure 3.3 illustrates the impact that the laws of the other three states would have had on the odds of the average Massachusetts bank closing, over time[36]. The effect of Ohio and Louisiana laws take the same pattern. They would have increased the odds of the Massachusetts bank closing between 1% and 2% in the first period, but only the Ohio impact is significant. Then, during the late 1830s, the Ohio and Louisiana laws would have increased the Massachusetts bank's odds by 5% and 6.5%, respectively. This is an increase of over twice the own-state odds.

[36] The actual odds are provided in table 3.7.

Beginning in 1840, the positive impact on the odds with Ohio and Louisiana laws decreases from the previous period but so does the own-state odds. While the own-state odds continued to fall, until the last subperiod, the positive effect of having Ohio law increases, thus widening the gap between them and causing what would have been an increase in the odds of closing by a multiple of 28 in the last subperiod. However, after 1840, the marginal impacts of Ohio law are no longer significant than at the 20% level.

The effect of Louisiana law on Massachusetts's banks takes a slightly different pattern. The odds did decrease after the 1836-1840 subperiod and they continued to do so through the rest of the 1840s. However, the effect of switching to Louisiana law, though lower in the 1840s, is not significantly different from Massachusetts' own-state odds. In the 1850s, this impact of Louisiana law would have grown such that the odds of closing would have increased by 10 to 12 times what it was under Massachusetts law.

The pattern of Tennessee law affecting the closing odds of the average Massachusetts bank takes a much different shape than that of the other two states' laws. Like all of the states, Massachusetts experienced a decrease in the odds of closing under Tennessee law. However, the impact of Tennessee law for the entire period (-0.32%), is less than (in absolute terms) the impact in the first two subperiods, -0.51% and –0.64%, respectively. The odds then steadily move toward zero by the end of the period because Massachusetts and Tennessee had the same average circulation ratio in the last subperiod, rendering no effect when Tennessee law is imposed on Massachusetts. The reason that the overall impact is less than the impact in the early subperiods is because the overall impact is a weighted average. There were more Massachusetts banks in the later

subperiods, when the Massachusetts legislature had improved its regulations; therefore, the weighted average (i.e. overall effect) is much lower than the impact on the odds in the earlier periods.

3.4.2 Results by subperiod for Ohio

For Ohio, the breakdown into subperiods presents a very different picture than the initial results from table 3.6. The odds of the average Ohio bank closing over the entire period was 0.731%, relatively low odds. However, from figure 3.2, it is evident that the first three subperiods are pulling up this average. The first subperiod reports the odds of closing as 1.33% and increases over the next two subperiods. Beginning in the 1846-1850 period, the odds dropped tremendously from 2.26% to 0.49%. This was coincident with the overhaul of the Ohio banking regulation that occurred in 1845. It appears that the change in the regulation drastically improved the sustainability of the banking system there. Although the odds increased slightly in the last subperiod, they never reverted back to the high odds in the first half of the period. This pattern is unexpected considering when the closings in Ohio occurred according to figure 2.4. Most of the banks that closed did so in the early 1840s and in response to the Panic of 1857. There were many more banks open in the last three subperiods which explains why the odds of closing are much lower than the first half of the period. However, there were no closings in the first 2 subperiods and the positive odds here must be an artifact of estimating a pooled model.

Figure 3.4 illustrates the results of the counterfactual for the average Ohio bank under the regulation of the other three states by subperiod. Just as with the Massachusetts subperiod analysis, these results are comparable to those of table 3.6 using the average

Ohio bank and the pooled model. The results of this exercise paint a very distinct picture of what would have happened to the Ohio banking sector if Ohio banks had been subject to laws other than its own. Massachusetts and Tennessee law would have exerted about the same influence on the odds of an Ohio bank closing over time. The only exception to this is the 1846-1850 period in which Massachusetts law would have increased the odds of closing while Tennessee law still would have decreased the odds. The general pattern of the effect of Massachusetts and Tennessee law is steadily to have decreased the odds of an Ohio bank closing from 1830 to 1845. This means that the laws of these two states actually would increasingly have improved an Ohio bank's chances of staying open in this interval. Then, in the 1846-1850 subperiod, this improvement would have greatly diminished and even deteriorated into an increase in the odds under Massachusetts law. For the last subperiod, these two states' impacts on the odds of closing would have again been significant and negative.

In specific, Massachusetts law, in the first subperiod, would have decreased the odds of an Ohio bank closing by 0.83% which is considerable given that the own-state odds were only about 1.3% in this subperiod. The improvement would have enlarged over the next two subperiods by decreasing the odds of closing by 1.4% and 1.6%, respectively. However, in the fourth subperiod, 1846-1850, Massachusetts's law would have increased the odds of closing by 0.26%. This would not have been a large increase but the sign change is particularly interesting. This occurred right after the 1845 change

in Ohio regulation, underscoring how much better the new regulation was for Ohio's banking system. Although, it still was not as good a fit as the Tennessee law would have been.

As already mention, the impact of Tennessee law follows a pattern similar to that of Massachusetts' law. However, the magnitude of the improvement in the odds of an Ohio bank closing would have been larger under Tennessee law. For instance, Tennessee law would have decreased the odds of an Ohio bank closing by 1.19%, 1.9% and 2.1%, for the first three subperiods respectively. In the subperiod 1846-1850, this improvement would have greatly reduced, though it remained an improvement of 0.29%. This is still an improvement over the own-state odds in this period, which were 0.49%, but, again, it does highlight the positive impact the 1845 Ohio law had. During the 1851-1855 subperiod, there is no significant impact of Tennessee law on Ohio banks. In the last subperiod, Tennessee law's improvement of the odds of closing increases only very slightly, such that switching to Tennessee law in the last half of the period would not have had the large helpful impact that it would have had in the first half.

The effect of imposing Louisiana law on Ohio banks would have significantly increased the odds of Ohio banks closing in all subperiods. The trend is similar to those of Massachusetts's and Tennessee's effects but with a different sign. The increase in odds that Louisiana law would have caused is decreasing in the first half of the period. In the first three subperiods, the marginal effects on the odds are only 0.51%, 0.41% and 0.05%, respectively. However, in the next subperiod, 1846-1850, the increase in the odds shoots up to 2.3%. In the last subperiod, the impact in the odds of an Ohio bank closing under Louisiana law would have been 3%, over 4 times that of the own-state odds at this time.

It is evident that once Ohio passed the 1845 law, the impact of Louisiana's law would have made the sustainability of the Ohio banking sector much more difficult.

3.4.3 Results by subperiod for Louisiana

The results for Louisiana over the entire period indicate that it would have been better off under the laws of Massachusetts and Tennessee. It is not surprising that Tennessee law would have lowered the odds of Louisiana banks closing; this would have occurred for Massachusetts and Ohio banks too. However, the magnitude of the improvement in the odds for Louisiana banks is much larger, especially for the subperiod 1836-1840. Additionally, this is the only subperiod in which the counterfactual produces even remotely significant changes in the odds. Before examining the effects of the other states' laws on Louisiana, it is useful to know what the odds of closing were under Louisiana's own law.

Figure 3.2 illustrates the pattern of the odds under the own-state law. In the first subperiod, the odds were almost zero. This is not unusual, as this earliest subperiod did not experience any major shock. The subperiod in which Louisiana experienced the majority of its closings was the 1836-1840 subperiod. Indeed this was the subperiod in which the own-state odds were the highest at 4.8% and the only one with odds of closing that are significantly different from zero. The only other subperiod that had odds that were even above 1% was the last, 1856-1860. These low and insignificant odds are expected considering the relatively few closings that occurred in Louisiana outside of subperiod 1836-1840, as seen in figure 2.6. Recall from chapter 2 that Louisiana's banks had a particularly difficult time during the Panic of 1837 due to the high amount of land

speculation that had occurred during the decade. There is a distinct decrease in the odds after 1840, presumably due to the passage of the renowned Bank Act of 1842.

There is a noticeable difference between the impact that the other states' laws would have had before the Bank Act of 1842 and after it. However, the only results that are somewhat significant are those for the second subperiod. In the results for the entire period counterfactual, the only significant results are negative as well. There are several reasons that could be the cause of this. Louisiana is the smallest part of the sample and the only state with primarily large banks; hence, using the pooled model results may not be the most appropriate specification. Additionally, Louisiana had a very different economy than the other three states, relying greatly on commerce, which necessitated a different banking system. The foremost reason, however, must be lie in the variable used to construct this counterfactual, the regulation variable, *LCIRC*. Louisiana had the highest circulation ratio, i.e. the most permissible. When the lower circulation ratios of the other states are imposed on Louisiana, the odds of closing would have decreased because the greater this variable is the greater the odds of closing.

Although the general results for Louisiana are not very remarkable, it is evident that the passage of the regulations in response to the Panic of 1837, including the Bank Act of 1842, helped to stave off many future failures. The only significant odds of closing occurred during the subperiod 1836-1840 and it was over this same period that the other states' laws might have significantly lowered the odds of closing for Louisiana banks. After this subperiod, Louisiana would not have provided any better for its banks by adopting the other states' regulations. The distinctive characteristics of Louisiana, especially its regulatory aspects, contribute to these distinct results.

3.4.4 Results by subperiod for Tennessee

Tennessee's results are the most consistent with the hypothesis that local regulators did a better job of sustaining banking systems for their locale than foreign regulators would have. This is evidenced by the bottom of table 3.7 in which there are no negative values. Tennessee also had the largest own-state odds of closing of the four states at 6.3%. From table 3.7, the odds of a Tennessee bank closing in the last subperiod, 1856-1860, was 13.1%. This is no surprise considering figure 2.8, which illustrates the large number of Tennessee banks that closed during this last subperiod. Although no banks closed in Tennessee in the subperiod 181-1855, the odds of closing are still positive; this must be an artifact of having to use a discrete pooled model while banks in Tennessee comprise a small part of the sample. In three of the first five subperiods, Tennessee also exhibited the highest odds of closing. It is only in the interval 1836-1845 that Tennessee was not experiencing the highest closing odds. The other three states all experienced many of their closings in either the Panic of 1837 or the recession in the early1840s; Tennessee did not. It was hit hardest by the Panic of 1857, causing such large odds in the last subperiod. This subperiod was also the one in which most of the antebellum Tennessee banks were open and so is most heavily weighted in the overall odds of closing. The odds of closing in Tennessee began the period higher than that of the other three states, near 2%, and climbed even higher in the second subperiod to 2.9%. Then, in the third subperiod, there was a sharp decline in the odds to 0.09%, which was the lowest that the Tennessee odds would reach and are not significant. In the 1846-1850 subperiod, the Tennessee odds were about 1%, which is roughly twice that of the other

states' odds but they only deteriorated after that. In the last two subperiods, the odds of a Tennessee bank closing rose to 3.9% then 13.1%, respectively. These are much greater than any of the other states' for the same two subperiods, which are all equal to or less than 1%.

Tennessee's distinctive banking experience over this period is reasonable for the different results from the other three states. Recall from chapter 2 that Tennessee had less than five banks in every year of the antebellum period before 1853. Almost all of these few banks were the large state banks to which the state legislature paid particular attention. The turbulent time in Tennessee's antebellum banking experience really only occurred in the last five years of the period. This is for two reasons: (1) the free banking law was passed in 1852 which caused the Tennessee banking sector to increase to almost seven times its 1852 size by 1857, and (2) there was a national financial panic in 1857. These two factors caused there to be many free banks open in Tennessee at a time that was treacherous even for more established banks. Hence, the number of bank closings that occurred in Tennessee as a result of the Panic was much higher than the number of banks that had even been open in Tennessee for the vast majority of the antebellum period.

The marginal effect on the odds of a Tennessee bank closing when switching from its own state law to that of another state would have been the largest marginal effect that is found in any of the cases examined for the overall period. This is especially clear when Ohio and Louisiana law are imposed on Tennessee in the first and last two subperiods. Figure 3.6 shows that most of the largest increases that Tennessee would have experiences falls in these four subperiods. These impacts are especially large when

considering that there is only one other instance of an increase in odds by over 10% is when a Massachusetts bank is exposed to Ohio law in the first subperiod; yet, in the case of Tennessee under Ohio and Louisiana law, the significant effects on the odds of closing range from 14.5%, under Ohio law in the first subperiod, to 70.6% under Ohio law in the last subperiod.

The impacts on the odds of a Tennessee bank closing under the laws of these two states follow the same pattern. In the first subperiod, Ohio law would have increased these odds by 14.5% and Louisiana law would have increased them by 19.6%. The odds would have increased in the second subperiod to 23% for Ohio and 26.7% for Louisiana. The lowest impacts on the odds from both states' laws occur during the 1841-1850 interval, which are not significant. In the fifth subperiod, the odds under Ohio regulation would have increased by 54% to 57.8% and, in the final subperiod, the odds that a Tennessee bank closes would have increased by 70.6%. This is by far the largest impact that the counterfactual yields. The effect of Louisiana law would have been similarly high but not quite of the same magnitude. For the 1851-1855 subperiod, the odds of a Tennessee bank closing would have increased by 32.8%. By the final subperiod, the impact of Louisiana law on the odds would have caused an increase by 55%; this is not as much as the impact of Ohio law but is still quite substantial relative to all of the other impacts.

The effects of Massachusetts's law on the odds of a Tennessee bank closing in each subperiod follow a different pattern than that of the other two states. Most noticeably, the effect of Massachusetts law on Tennessee banks is not significant in any of the subperiods. However, it is evident that instead of an increasingly positive impact of

the odds of closing, the effect of Massachusetts law convergences zero by the last subperiod. This drastically contrasts with the impact of the other two states, whose laws would have exerted the biggest impacts on the odds of any state's banks under another's law.

As mentioned earlier, Tennessee had a banking system that consisted of a core of three large banks. These banks had close ties with the state administration; one was explicitly controlled by the state. The empirical results for Tennessee indicate the largest impact of switching laws with another state, ranging between 2% to 61% in the pooled model over the entire period. Given the political influence on the banks, the regulations enacted in Tennessee must have been particularly salient features of the banking system. The regulators in Tennessee were, in essence, the owners of the large banks. Hence, regulation may have served as the conduit through which the state legislature could operate the large banks. Although Tennessee legislators were more invested in the large banks, Tennessee regulation would have lowered the odds of banks closing in all of the other states, even ones with primarily small banks.

The relative stability of Tennessee large banks is also evident by the odds of closing under their own-state laws, shown in table 3.6. Tennessee large banks under the pooled model have 1.6% chance of closing, while the small banks under the same model have a 13% chance of closing. Additionally, table 3.1 confirms the instability of small banks, especially during the Panic of 1857. The fact that these small banks were mostly founded under the general free banking law may contribute to their instability because the laws governing them were not catered to their needs, as they may have been for the larger

banks. However, even though the small Tennessee banks were much more unstable than the large ones, they were still more likely to remain in operation than if they had been under another state's regulation.

By utilizing four states with very different economies and backgrounds, it is apparent that these states actively pursued and enacted laws that, in the majority of cases, were most appropriate for maintaining their distinct banking systems. Most notably, Tennessee experienced the largest increase in the odds of bank failures when having the laws of the other states. The politically-controlled group of banks that provided the core of Tennessee's system allied regulators objectives with those of these banks and allowed them to thrive. The fate of Tennessee's small banks was less assured but their prospects were certainly better than they would have been under another state's laws. Overall, these results suggest that the states were not only distinct from each other, but that the regulators knew about these differences and in most cases enacted the most suitable regulation for their states. The present findings indicate that using one regulation system for all states is inferior to local regulation.

Variable over 1830-1860	Tennessee[37]	Louisiana	Ohio[38]	Massachusetts
Number of banks	33	21	84	208
Number of banks that closed	19	9	32	36
Number of small banks (capital < $1mil.)	29	5	84	192
Number of small banks that closed	19	3	30	36
Number of large banks (capital ≥ $1mil.)	3	16	3	16
Number of large banks that closed	0	6	2	0

Source: http://research.mpls.frb.fed.us/research/economists/wewproj.html.

Table 3.1: Summary of Weber data, 1830 – 1860

Variable	Definition
ASSETS	Level of assets held on balance sheet by bank i in year t-1
CIRC	Circulation ratio held on balance sheet by bank i in year t-1
CAPT	Level of capital in the thousands held on balance sheet by bank i in year t-1
LCIRC	Legal maximum circulation ratio in bank i's state in year t-1
SCAPT	Lowest level of capital observed in bank i's state in year t-1
BDENS	Number of banks open per 1000 white males in bank i's state in year t-1
PANYRS	Number of years since last panic
POL	= 1 if governor of bank i's state is a Whig in year t-1; = 0 otherwise
DEV	The percentage deviation from trend of the value of a basket of bank i's state's production
AGE	Number of years bank i has been open in year t-1

Table 3.2: Definition of explanatory variables

[37] The Southwestern Railroad bank was only open for two years. It had $1million in capital its first year and $100,000 the next (and last) year. It is included in "all banks" but not in the small nor large ones.
[38] The 3 large banks were small banks before they were reestablished as an independent bank and 2 branches of the state system.

Massachusetts					
Variable	Mean	Median	Std. Dev.	Minimum	Maximum
ASSETS	628.3824	351.0331	753.9731	50	8436.715
CIRC	13.8737	11.1845	14.1435	0.216	368.8387
CAPT	321.4257	200	367.751	41.06	4000
LCIRC	2.307	2.5	0.2435	2	2.5
SCAPT	75.0845	75	24.464	41.06	100
BDENS	0.2852	0.2902	0.0316	0.2041	0.353
PANYRS	9.3003	10	6.3491	0	19
POL	0.8363	1	0.3701	0	1
DEV	0.3915	1.7151	5.2672	-10.6737	8.8194
AGE	18.3242	16	13.8133	1	77
Ohio					
Variable	Mean	Median	Std. Dev.	Minimum	Maximum
ASSETS	486	372.3997	465.2747	74.456	6588.145
CIRC	4.627	3.949	10.039	0.0431	202.3514
CAPT	150.4285	100	170.8071	20	1000
LCIRC	2.4528	2	0.6283	1.7	3.3333
SCAPT	30.2803	25	22.5524	7.939[39]	300
BDENS	0.0498	0.047	0.0115	0.0175	0.0637
PANYRS	9.6692	11	6.7688	0	19
POL	0.6994	1	0.4589	0	1
DEV	1.5697	-0.3447	10.4813	-22.7343	19.5291
AGE	8.8822	8	7.7685	1	53
Louisiana					
Variable	Mean	Median	Std. Dev.	Minimum	Maximum
ASSETS	5321.225	4289.472	3309.937	398.1981	16883.08
CIRC	2.3285	1.0249	4.0558	0.0194	27.8764
CAPT	26633.64	1998.59	1741.474	101	7820
LCIRC	3	3	0	3	3
SCAPT	826.1404	507.8	578.1366	101	1938.04
BDENS	0.1119	0.07144	0.0676	0.0364	0.2072
PANYRS	7.3711	5	6.6016	0	19
POL	0.4588	0	0.4996	0	1
DEV	0.2842	-0.1936	11.2064	-23.6599	23.2238
AGE	14.6804	13	10.5767	1	42
Tennessee					
Variable	Mean	Median	Std. Dev.	Minimum	Maximum
ASSETS	1970.105	414.288	2333.463	13	7771.06
CIRC	4.2849	3.5238	2.9148	0	19.6342
CAPT	889.1751	118.865	1130.476	21.5	3679.668
LCIRC	2	2	0	2	2
SCAPT	380.4416	50	744.8499	20[18]	2617.284
BDENS	0.0376	0.0379	0.0207	0.0064	0.0663
PANYRS	8.7966	6	7.8047	0	19
POL	0.1299	0	0.3372	0	1
DEV	-0.0271	-1.43068	8.8084	-22.3373	19.2728
AGE	6.9379	4	7.0446	1	28

Table 3.3: Summary statistics by state, 1830-1860[40]

[39] The bank with the lowest observed capital, from which this number comes, had incomplete data and, therefore, was not used in the logit analysis. Hence, minimum *CAPT* is not equal to minimum *SCAPT*.

All banks in sample				
Variable	Mean	Std. Dev.	Minimum	Maximum
ASSETS	847.884	1423.67	13	16883.08
CIRC	11.781	13.7123	0.019	368.839
CAPT	412.182	708.974	20	7820
LCIRC	2.344	0.354	1.7	3.333
SCAPT	109.114	244.547	20	2617.28
BDENS	0.237	0.099	0.006	0.353
PANYRS	9.255	6.489	0	19
POL	0.776	0.417	0	1
DEV	0.534	6.706	-23.66	23.224
AGE	16.456	13.36	1	77
OH	0.138	0.345	0	1
LA	0.04	0.197	0	1
TN	0.037	0.188	0	1
Banks with less than $1 million of capital				
Variable	Mean	Std. Dev.	Minimum	Maximum
ASSETS	477.250	381.843	13	3146.55
CIRC	12.82407	14.0496	0.0431	368.839
CAPT	230.779	187.504	20	1000[41]
LCIRC	2.324	0.3385	1.70	3.333
SCAPT	67.6	41.424	50	1000[42]
BDENS	0.243	0.0946	0.0105	0.353
PANYRS	9.341	6.480	0	19
POL	0.794	0.4043	0	1
DEV	0.569	6.446	-22.734	23.224
AGE	16.120	13.313	1	77
OH	0.1496	0.357	0	1
LA	0.0044	0.066	0	1
TN	0.0260	0.159	0	1

Table 3.4 (continues)

[40] See source for table 3.1.
[41] Atlas Bank and Market Bank, both in Massachusetts, only held capital equal to $1 million for 2 and 3 years for the 28 and 25 years, respectively, that they were open during the antebellum period.
[42] Colombian Bank in Boston had $1million in capital in the last year of the sample period.

Table 3.4 (continued)

Banks with $1 million of capital or more				
Variable	Mean	Std. Dev.	Minimum	Maximum
ASSETS	4070.005	2606.54	1133.986	16883.08
CIRC	2.457	2.776	0.0194	27.876
CAPT	1995.84	1339.41	101[43]	7820
LCIRC	2.5217	0.4322	2	3
SCAPT	470.002	649.112	50	2617.28
BDENS	0.1782	0.1147	0.0064	0.353
PANYRS	8.4865	6.5242	0	19
POL	0.6149	0.4871	0	1
DEV	0.2195	8.6944	-23.6599	23.2238
AGE	19.4534	13.4241	1	69
OH	0.0331	0.1792	0	1
LA	0.3623	0.4812	0	1
TN	0.1304	0.3371	0	1

Table 3.4: Summary statistics by size of bank, 1830-1860[44]

[43] The Union Bank of Louisiana's capital fell to $101,000 in 1852, while it was liquidating before it re-opened as a free bank. Three other banks had less than $1 million in capital for one year: Bank of New Orleans had $501,775 in 1853, Commercial Bank of Cincinnati had $781,274 in 1842 and Planters Bank of Tennessee had $991,874 in 1835.

[44] See source for table 3.1.

Variable	Pooled model		Small banks model[45]	
	Model I	Model II	Model III	Model IV
	Parameter estimate (t-ratio)	Parameter estimate (t-ratio)	Parameter estimate (t-ratio)	Parameter estimate (t-ratio)
INTERCEPT	-14.1649*** (-7.03)	-13.8484*** (-6.88)	-15.1013*** (-6.83)	-15.064*** (-6.97)
ASSETS	0.000181 (0.99)	0.000215 (1.18)	0.00089* (1.96)	0.000845* (1.83)
CIRC	0.00887* (1.66)	0.00884* (1.66)	0.00887* (1.84)	0.0091* (1.80)
CAPT	-0.00116*** (-2.59)	-0.00109** (-2.44)	-0.0005 (-0.43)	-0.00022 (-0.19)
LCIRC	2.6473*** (4.32)	2.6383*** (4.32)	2.687*** (4.26)	2.6219*** (4.28)
SCAPT	_____	-0.00235 (-1.19)	_____	-0.0108** (-2.26)
BDENS	14.8087*** (3.46)	14.4717*** (3.31)	16.4071*** (3.28)	19.8642*** (3.68)
PANYRS	-0.0747*** (-3.89)	-0.0774*** (-4.03)	-0.0819*** (-4.03)	-0.0945*** (-4.54)
POL	-0.3125 (-0.87)	-0.2946 (-0.81)	-0.2979 (-0.78)	-0.3044 (-0.78)
DEV	0.00109 (0.07)	0.000496 (0.03)	0.0138 (0.80)	0.0135 (0.79)
AGE	-0.0116 (-0.85)	-0.0135 (-0.99)	-0.0155 (-1.10)	-0.016 (-1.13)
OH	3.111** (2.54)	2.9089** (2.36)	3.4554** (2.47)	3.8675** (2.69)
LA	3.2324*** (3.60)	3.9459*** (3.31)	2.3935** (2.18)	6.4495*** (3.18)
TN	7.0357*** (6.07)	6.8763*** (5.91)	7.5971*** (5.62)	7.999*** (5.81)

*** denotes significance at the 1% level, ** 5% level, * 10% level

Table 3.5: Results of the discrete duration model, four specifications

[45] Louisiana only had 5 banks with capital of less than $1 million.

Odds of "average bank closing" in its own state using the four above models and banks				
	MA	OH	LA	TN
1. Avg. bank & model I	0.005833*** (0.0021)	0.00731*** (0.0026)	0.0138*** (0.005)	0.063434*** (0.0217)
2. Avg. sm. Bank & model III	0.006128*** (0.001)	0.006554* (0.0035)	0.126865** (0.0596)	0.130424*** (0.0263)
3. Avg. sm. Bank & model I	0.006266*** (0.0014)	0.007172* (0.0038)	0.13288** (0.0546)	0.130196*** (0.0318)
4. Avg. lg. Bank & model I	0.002013** (0.0009)	0.009577** (0.0045)	0.010676** (0.0069)	0.015649 (0.011)
Note: Standard errors in parentheses				
1. Using the average bank from each state and model I				
j k	MA	OH	LA	TN
MA	----	-0.00325 (0.809)	-0.01188** (6.7829)	0.021421 (1.3329)
OH	0.052695 (3.3353)	----	0.007114 (0.4268)	0.607602*** (10.6656)
LA	0.029609* (4.3903)	0.023084** (6.9858)	----	0.425337** (6.1803)
TN	-0.00324 (2.3581)	-0.00509 (2.7253)	-0.01281** (7.3523)	----
Note: The Wald statistics, in parentheses, test if the predicted value from the counterfactual is significantly different from the predicted value under own-state laws.				
2. Using the average small bank from each state and model III				
j k	MA	OH	LA	TN
MA	----	-0.0028** (7.8712)	-0.10787* (4.5964)	0.040596*** (10.5906)
OH	0.056669 (3.7068)	----	0.055614* (4.704)	0.695778*** (34.0456)
LA	0.031679** (5.347)	0.022415*** (45.0729)	----	0.557362*** (15.9017)
TN	-0.00346*** (10.9592)	-0.00453** (6.0782)	-0.11707* (4.5804)	----
Note: Louisiana only had 5 banks with capital of less than $1 million. Wald statistics in parentheses				
3. Using the average small bank from each state and model I				
j k	MA	OH	LA	TN
MA	----	-0.00303 (0.4591)	-0.11228** (5.9583)	0.039873 (3.2354)
OH	0.055778 (3.3706)	----	0.056701** (5.7413)	0.688252*** (33.6645)
LA	0.03136* (4.4922)	0.023787*** (14.7948)	----	0.548563*** (15.8071)
TN	-0.0035*** (19.4532)	-0.00491** (5.3324)	-0.12215** (5.9704)	----
Note: Louisiana only had 5 banks with capital of less than $1 million. Wald statistics in parentheses				

Table 3.6 (continues)

Table 3.6 (continued)

4. Using the average large bank from each state and model I				
j k	MA	OH	LA	TN
MA	----	-0.0076** (5.3575)	-0.0092 (2.368)	0.005652 (0.5142)
OH	0.020542 (2.1437)	----	0.00553 (2.0489)	0.308125 (1.8124)
LA	0.011442 (2.6405)	0.005448** (6.0066)	----	0.167632 (1.5378)
TN	-0.00105** (5.1853)	-0.0085** (5.0859)	-0.00991 (2.3825)	----
Note: Ohio only had 3 banks and Tennessee only 4 banks with capital of $1 million or greater. Wald Statistics in parentheses				

*** denotes significance at the 1% level, ** 5% level, * 10% level

Table 3.6: Marginal effect on odds of closing of specified average bank in state k when changing from state k's laws to state j's laws[46]

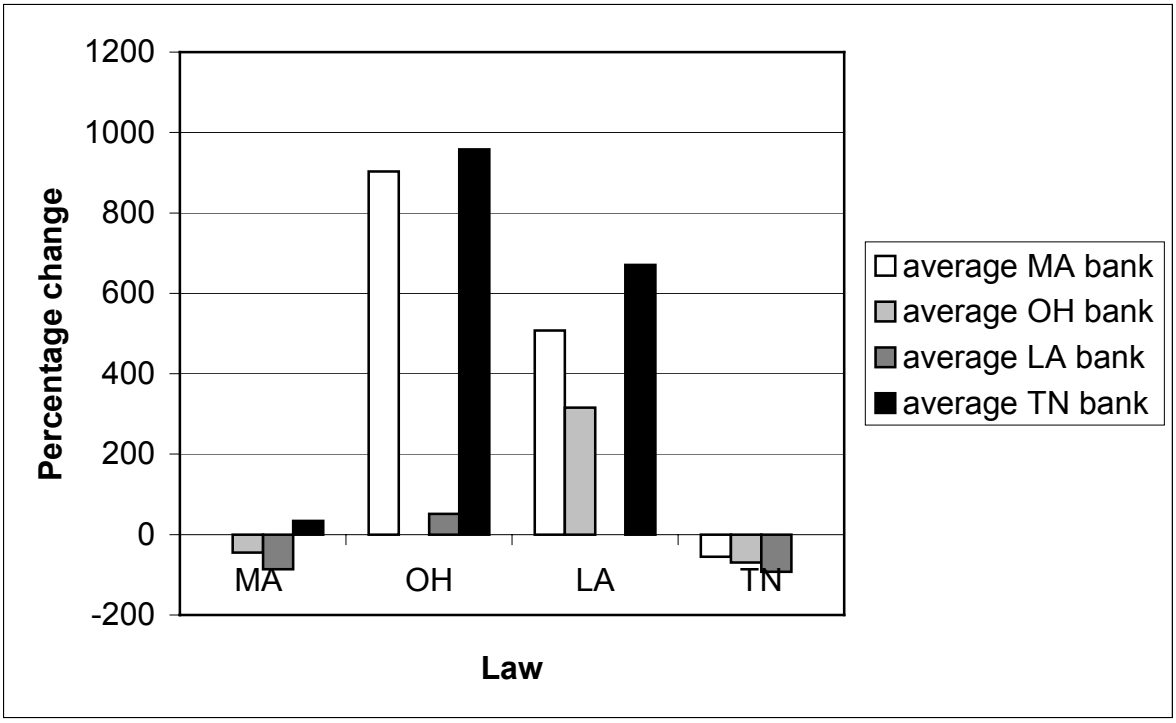


Figure 3.1: Percentage change in odds of average bank closing when switching to laws of another state, using model I

[46] The same procedure was performed on the "median bank" for all banks, small ones and large ones. The signs and general magnitude of the marginal effects are the same in all but a few cases where, because the median was used, the effect had become zero.

	1830-1835	1836-1840	1841-1845	1846-1850	1851-1855	1856-1860[47]
Odds of average bank closing with its own law						
MA	0.006971***	0.026071***	0.008766***	0.004605***	0.002199***	0.003897***
	(0.0019)	(0.0055)	(0.0023)	(0.0015)	(0.0008)	(0.0013)
OH	0.013317**	0.020816***	0.022602***	0.004907*	0.006075	0.007216*
	(0.0059)	(0.0075)	(0.0074)	(0.003)	(0.0039)	(0.0042)
LA	0.001249	0.047727*	0.00402	0.006069	0.003295	0.010671
	(0.007)	(0.0265)	(0.0034)	(0.0044)	(0.0027)	(0.00749)
TN	0.019027*	0.028977*	0.008568	0.01061	0.038737***	0.131276***
	(0.0119)	(0.0185)	(0.0073)	(0.0074)	(0.0147)	(0.033)
Note: Standard errors in parentheses						
MA bank						
OH law	0.011622*	0.05106**	0.029115	0.035703	0.054012	0.113844
	(4.2813)	(5.0625)	(3.3304)	(2.1359)	(2.5821)	(2.9905)
LA law	0.018727	0.065312*	0.023391	0.012479	0.021854*	0.048437*
	(3.6461)	(4.6759)	(3.6053)	(3.1123)	(4.0687)	(4.6105)
TN law	-0.00511***	-0.019***	-0.00642***	-0.00337**	-0.00046***	0
	(10.4097)	(15.4488)	(10.6823)	(7.6287)	(10.888)	(0)
Note: Wald Statistics in parentheses						
OH bank						
MA law	-0.00834**	-0.01406***	-0.01674***	0.002619**	-0.00294	-0.00446*
	(6.4425)	(37.5053)	(11.1043)***	(6.9985)	(3.7562)	(4.6422)
LA law	0.005127**	0.004117***	0.00048***	0.022793***	0.022916**	0.030301***
	(6.7322)	(1176.228)	(8.9754)	(11.5621)	(6.8271)	(12.8804)
TN law	-0.0119**	-0.01901***	-0.02093	-0.00289*	-0.00396	-0.00446*
	(5.6463)	(12.3483)	(10.3255)	(4.3177)	(3.4417)	(4.6422)
Note: Wald Statistics in parentheses						
LA bank						
MA law	-0.00686	-0.03456	-0.00295	-0.00445	-0.00306	-0.00991
	(1.708)	(3.1746)	(1.3964)	(1.8942)	(1.4645)	(2.0191)
OH law	-0.00262	-0.00773	0.000987	0.008472	0.004631	0.014732
	(1.6317)	(3.0257)	(1.3012)	(1.5993)	(1.2745)	(1.6804)
TN law	-0.0087	-0.04419	-0.00373	-0.00564	-0.00306	-0.00991
	(1.7457)	(3.2298)	(1.4113)	(1.9293)	(1.4645)	(2.1901)
Note: Wald Statistics in parentheses						
TN bank						
MA law	0.048897	0.071839	0.02288	0.028119	0.002477	0
	(-2.8208)	(-2.7215)	(1.0728)	(1.4476)	(-0.002)	(0)
OH law	0.145312***	0.230395***	0.115249	0.257215	0.540144**	0.706248***
	(-11.2942)	(-13.1672)	(1.0443)	(1.5079)	(6.2411)	(38.7745)
LA law	0.195916***	0.267414***	0.100158	0.120859	0.32848*	0.549552***
	(-16.6194)	(-16.3332)	(1.0425)	(1.3775)	(4.0876)	(15.5895)
Note: Wald Statistics in parentheses						

*** denotes significance at the 1% level, ** 5% level, * 10% level

Table 3.7: Marginal effect on odds of closing of an average bank during six subperiods when changing from its own state's law to that of another, under model I

[47] MA and TN have the same regulation in period 1856-1860 therefore the marginal effect is zero of an MA bank having TN law and vice versa. Additionally, the marginal effect of an OH bank having MA regulation is the same as it having TN regulation and the marginal effect of an LA bank having MA regulation is the same as it having TN regulation in this subperiod.

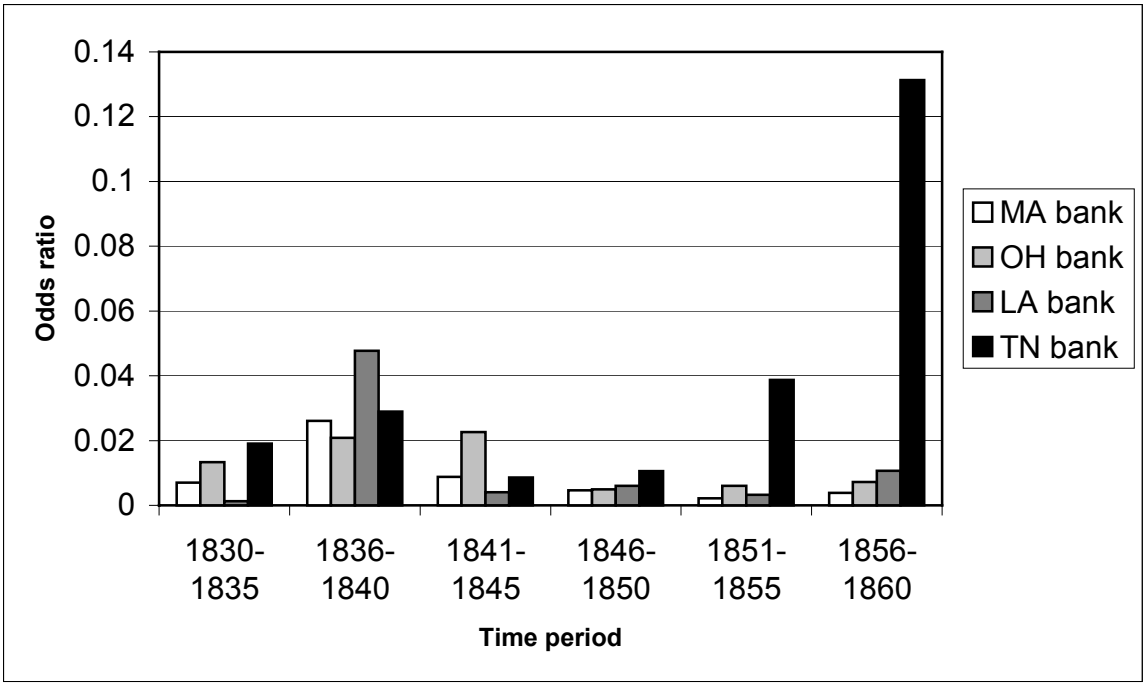


Figure 3.2: Odds of average bank closing with its own law

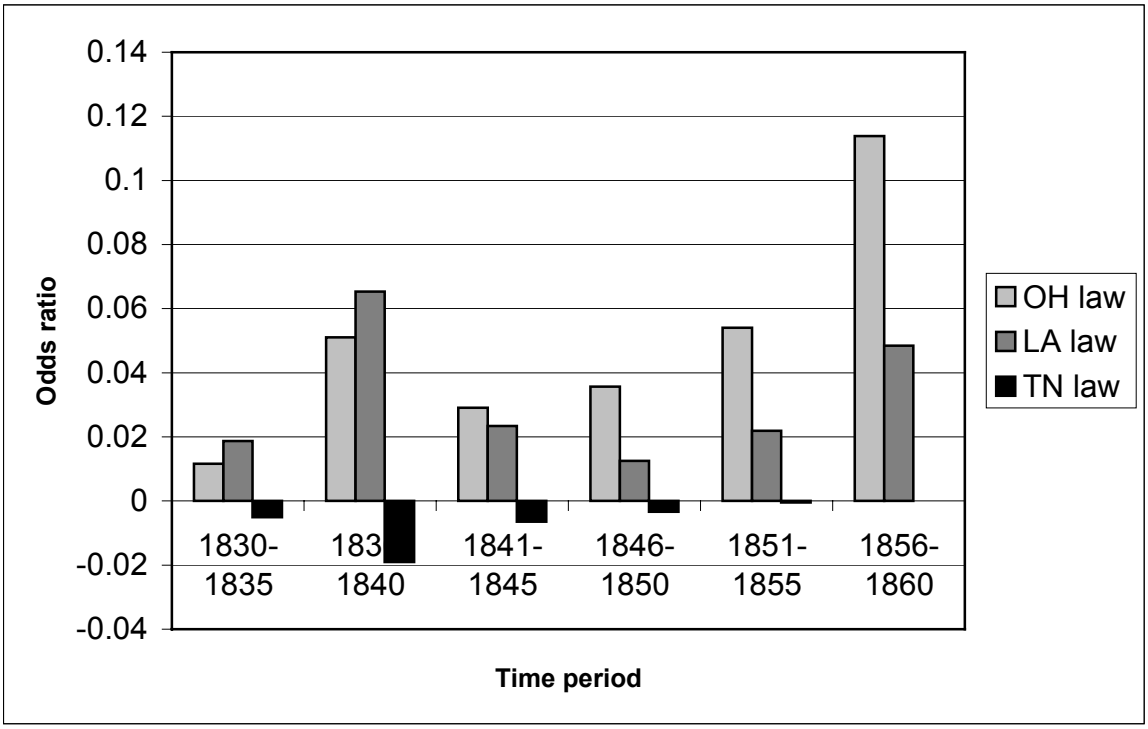


Figure 3.3: Marginal effect of the odds of a Massachusetts bank closing under different laws over time

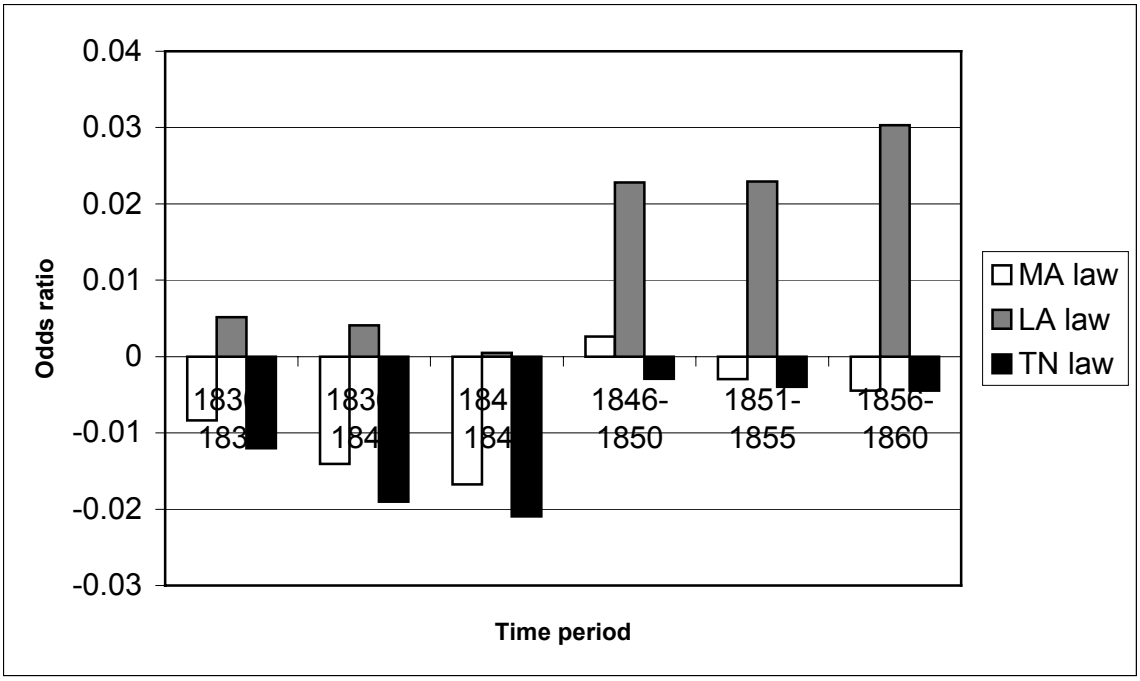


Figure 3.4: Marginal effect of the odds of an Ohio bank closing under different laws over time

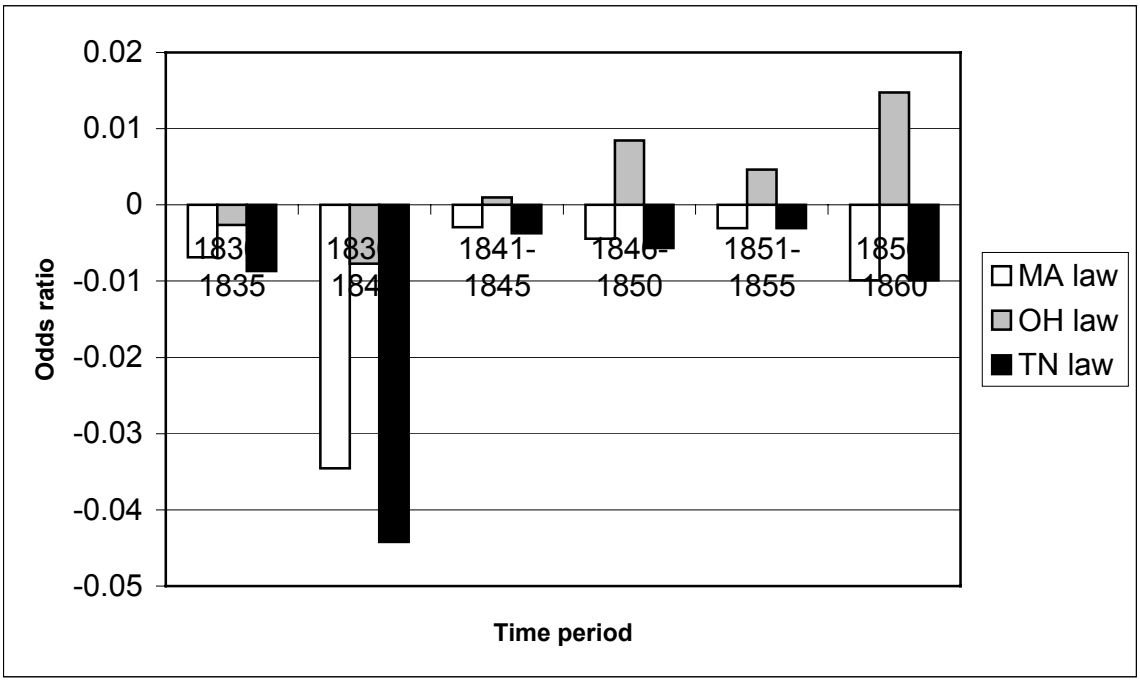


Figure 3.5: Marginal effect of the odds of an Louisiana bank closing under different laws over time

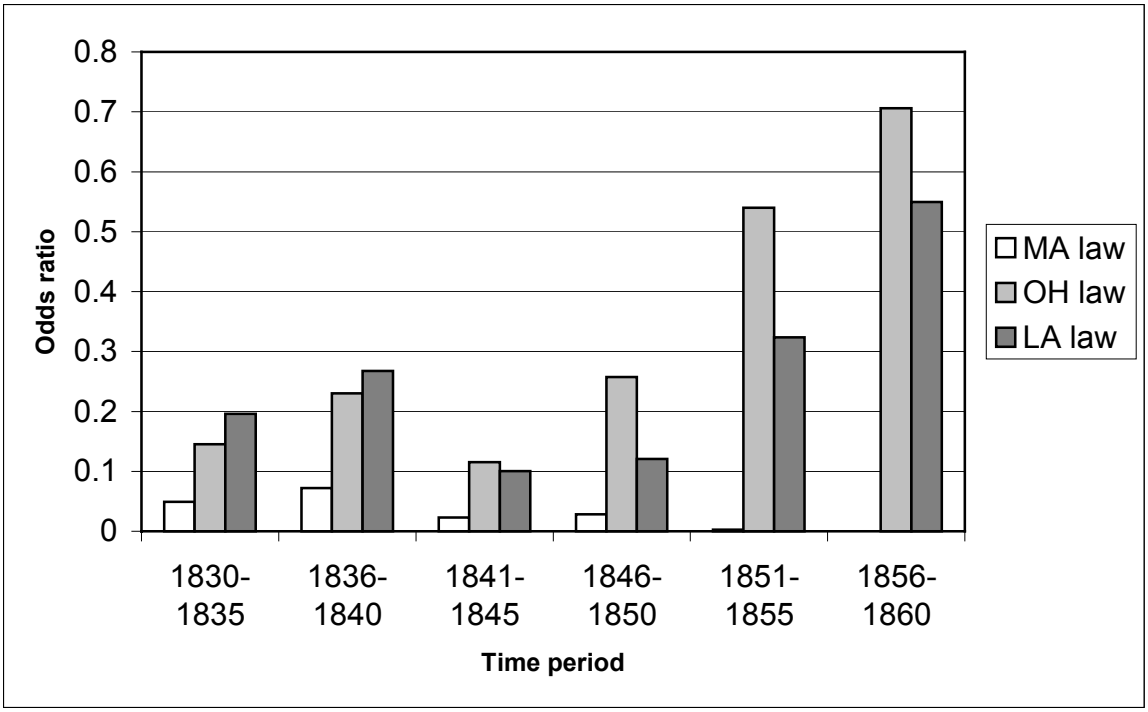


Figure 3.6: Marginal effect of the odds of an Tennessee bank closing under different laws over time

CHAPTER 4

CONCLUSION

As Richard Sylla explains:

> The task for our time is not to decide whether regulation, deregulation, or reregulation is the road to take. Rather, it is to determine the regulatory arrangements that assure the safety of bank liabilities held by the public and the responsibility of the financial system to its clients while allowing latitude for the markets to promote efficiency, innovation, and economic growth. … The task, however, will be easier if we embark on it with a better understanding of our financial history. (Sylla 1993, p. 131)

Given this imperative, it is easy to see the value of studying banks in the antebellum period. Although modern financial systems consist of more than simply banks, they also operate contingent upon the state of financial regulation. The origins of financial regulation are pertinent to an understanding of the operation of the financial system today under the current regulatory environment. It cannot be assumed that current laws exist because they are superior to all alternatives. Rather, such regulatory regimes represent the cumulative effect of historical political experiences. Consequently, it is important to know the origins of regulations in order to understand how far they have come.

For Massachusetts, banking regulation during the antebellum period can be characterized by varying amounts of governmental control. Early in the period, Massachusetts's legislators approved many bank charters, permitting the banking sector

to increase in size a great deal. In 1835, however, this attitude changed when the legislature passed a provision holding stockholders personally liable for bank losses. Then, after the onset of the Panic of 1837, a bank examiners board was created, which increased the power of the legislature in banking matters. This move toward greater government control was also meant to be in the public's interest by attempting to restrain bank officials' risky activities. During these years, 1837-1843, Massachusetts lost 23 banks, the most banks it would lose during the antebellum period. In 1843, the bank commissioners board disbanded but a special committee was organized that could still examine banks whenever stockholders demanded it, a move toward less government. There were few bank losses for the rest of the 1840s. In 1851, the free banking law passed and the regulators made it even easier for stockholders to call for exams of their banks. This move towards the public interest allowed the number of banks steadily to increase from 1844 to 1860.

The results of the counterfactual over the entire period show that Massachusetts managed to strike a good balance between too much government control and not enough for much of the period. This is evidenced by the relatively low odds of closing that Massachusetts banks experienced over the period, 0.58%. Under Ohio and Louisiana laws, a Massachusetts bank's odds of closing would have increased by 5.3% and 3%, respectively. Tennessee law would not have significantly affected the Massachusetts odds.

Despite their changing attitude toward government intervention, Massachusetts legislators managed to maintain a banking sector quite effectively, relative to the alternative regulatory systems of Ohio and Louisiana. Ultimately, the relative circulation

ratios dictate what each state's effect will be on the odds of closing as this variable is used to proxy for regulation. Additionally, it is found to be significantly positive in the duration model; therefore, increases in the circulation ratio will cause increases in the odds of closing. However, imposing a lower circulation ratio on a state is not a sufficient condition for significantly lowering the odds of closing.

The subperiod breakdown further elucidates the impact that other state's laws would have exerted on Massachusetts banks. The effects that Ohio and Louisiana laws would have had on the odds of a Massachusetts bank closing are greatest in the 1836-1840 and 1856-1860 subperiods. Those laws would have increased Massachusetts's odds by 5%, for Ohio, and 6.5%, under Louisiana law, in the earlier subperiod and by 11.4% and 4.8% in the latter one. This shows that, although Massachusetts's banks actually did have a difficult time in the wake of the 1837 panic, other regulators would have caused even more failures in Massachusetts at that time. Before 1845, Ohio regulators had established a smaller system of banks that it controlled tightly and Louisiana regulators had created a system of several large banks; both would have been worse for Massachusetts's large system of small banks. After 1845, Ohio enacted the Kelly Bank Act that provided for a larger system of different types of banks, though they were still small banks. This act initiated a larger banking system of small banks in Ohio. Therefore, after 1845, Ohio regulation no longer would have exerted a significant impact on Massachusetts's banks odds of closing. After 1840, Louisiana's system had become a smaller one but still composed of mostly large banks. Hence, Louisiana regulation still would have significantly increased the odds of a Massachusetts bank closing.

Under Tennessee law, Massachusetts's banks would have actually fared the Panic of 1837 better. Tennessee law would have decreased Massachusetts's odds by 2.6%, in 1836-1840. Considering that the odds of a bank failing in Massachusetts in that subperiod were 1.9%, this would have been quite an improvement. However, in all the other subperiods, the largest improvement in Massachusetts's odds from adopting Tennessee's tighter regulation would have been 0.6%, during the 1840s recession. The decrease in odds that Tennessee law would have provided is eliminated by the end of the period, when Massachusetts and Tennessee had the same circulation ratio, and thus no impact on each other's odds in the counterfactual.

It seems that Massachusetts's fickle stance on choosing the optimal amount of government control over its banking sector could have been better during the Panic of 1837. However, the evidence also suggests that Massachusetts's regulators were improving after 1837, relative to alternative regulatory regimes. In addition to the empirical indications, the stability of the Massachusetts banks during the Panic of 1857 suggests that the regulators had improved. Of the four states, Massachusetts certainly saw the greatest increase in the size of its banking sector between 1830 and 1860.

Ohio regulators, like those of Massachusetts, approved many charters in the early 1830s allowing a large increase in the number of banks. The degree of competition this engendered was surely in the public's interest. However, as a response to the Panic of 1837, Ohio legislators established more control over the banks. In 1842, they passed a law under which banks could avoid the expiration of their charters but they would have to accept taxes on circulation and bank officials being personally liable for bank losses. Not

surprisingly, this effort to lower risk-taking by banks and increase the government's role did not motivate banks to renew their charters. One third of the banks closed in 1843.

In 1845, Ohio legislators devised a new banking system that gave dispensations to all parties involved, i.e. public, private and governmental. This law established a safety fund to protect depositors and noteholders, and gave banks options in choosing their type of bank, independent, state branch or chartered. This law resulted in a huge increase in the number and types of banks in just three years. Though the distinctive arrangement that this law yielded did not completely protect Ohio banks during the 1857 panic, the 1860 Ohio banking sector was still over three times larger than its 1845 size.

Despite Ohio regulators being unsure about their role in the banking sector, Ohio had the second lowest odds of closing, 0.7%, of the four states in the antebellum period. This implies a fairly stable system. However, Massachusetts's law would have decreased those odds by 0.3%. Louisiana law would have increased the odds by 2.3%. Because of the distinct division between regulation in the first half of the period and that in the second half, the statistics for the entire period are not as informative as those of the subperiods.

The drastic change in Ohio's regulation in 1845 can clearly be seen in figure 3.4. While it is evident that Massachusetts and Tennessee laws would have decreased the odds of an Ohio bank closing, the extent to which these improvements would have happened is much less in the second half of the period, post-1845, than in the first half. Indeed, Massachusetts's regulation would have actually increased the Ohio odds in the subperiod 1846-1850. The restrictive anti-banking stance in the first half of the period, which culminated in the 1842 law, indicates why Massachusetts and Tennessee law

would have so improved the survivability of Ohio banks. After the 1845 law, this improvement would have shrunk considerably.

Under Massachusetts's law, the odds of an Ohio bank closing would have decreased between 0.8% and 1.7% over the period 1830-1845. However in the subperiod 1846-1850, Massachusetts's law would have increased the Ohio odds by 0.3%, a small but positive amount. In the last subperiod, Massachusetts's law would have again decreased the odds, only by 0.4%. Tennessee law would have improved Ohio's odds between 1% and 2% in the first half of the period, but in the second half, the improvement would have only been between 0.3% and 0.4%. Although Massachusetts and Tennessee laws would have helped Ohio banks survive, the obvious difference between this improvement in the first and second halves of the period suggest that Ohio regulators were certainly improving.

The regulatory change in 1845 is also evidenced by the effect that Louisiana law would have had on Ohio banks. Louisiana law would have increased the odds of an Ohio bank closing in all of the subperiods. However, between 1830 and 1845, this increase would have been between 0.4% and 0.5%. Between 1846 and 1860, this increase would have been between 2.3% and 3%. Again, this exhibits that Ohio legislators had improved, relative to external regulators, with the 1845 law. The severe reaction of Ohio legislators to the Panic of 1837 was apparently less suitable for Ohio banks than the 1845 law that aimed at appeasing both the public and the banks, in addition to the legislators themselves.

No other state in this study had such a clear division in its governance than Louisiana. This state had a Whig governor from 1830 until 1843 and then a Democratic

one for the rest of the antebellum period. This division can be seen in its legislation too. Early in the period, Louisiana had established three, large, state-sponsored banks, which survive throughout the period. These obviously benefited the government by not only giving it more control of the banking system but also a source of funds. The Whigs allowed a large increase in the number of banks, as occurred in Massachusetts and Ohio also. The increased competition was in the public's interest but when the Panic of 1837 struck, the populace was very distraught over the suspension of payments. This anxiety resulted in an 1842 law that mandated a reserve requirement on deposits and circulation and the forfeiture of charters for banks who suspended. Regardless of their efforts, the Whigs lost the governorship in 1843. The Democrats had their own idea of what was in the public's interest. They instituted a new constitution in 1845 that, basically, attempted to prohibit banking by disallowing any new charters or expansions of old ones. Because of this severe restriction, the new constitution only lasted until 1852. The earlier mandate against banks was changed, which permitted passage of the free banking law in 1853. Though the Democrats maintained power, they were forced to compromise with the Whigs and find a solution that permitted the existence of banks with some oversight by the government. By the end of the period, the number of banks had begun to increase again.

The empirical model shows that Louisiana banks had the second highest odds of closing of the four states at 1.4%. However, Louisiana would have been the least affected by the imposition of the other states' laws. Massachusetts and Tennessee laws would have decreased the odds of a Louisiana bank closing by 1.2 % and 1.3%, respectively,

while Ohio law would not have significantly affected the odds. Despite these improvements in the odds, the degree to which they would have been affected is much less than in the other states.

The temporal breakdown shows that the odds of a Louisiana bank closing are not significantly different from zero in all subperiods except 1836-1840, when most of the Louisiana closings occurred. In this subperiod, the odds of a bank closing were 4.8%, the highest of the four states. This is what causes Louisiana's odds under its own laws so high for the entire period. Over 1836-1840, the laws of all three other states would have lowered the odds of a Louisiana bank closing, though the impacts have low significance. Massachusetts and Tennessee laws would have decreased these odds by 3.5% and 4.4%, respectively, while Ohio law would have decreased them by 0.8%. By approving so many charters and increasing the size of the banking sector, the Whigs' version of public interest exacerbated the instability caused by the 1837 panic. Any of the other states' laws may have been better at maintaining the Louisiana banks in the subperiod 1836-1840 but none of the other subperiods exhibit significant changes in the odds of a Louisiana bank closing. The regulatory changes that occurred in Louisiana in 1842 and after shows that Louisiana legislators certainly improved over the period.

The motivation behind much of Tennessee's regulation can be generally characterized by the leviathan approach. Although the controlling party in the state fluctuated between the Whigs and Democrats, both seemed to have provided for the needs of the government. This is especially evident by the existence of the three state-supported banks that made up the core of the banking system in Tennessee throughout the antebellum period. Though there were opponents of banking, they were never enough to

pass legislation that would adversely affect the dominance of the state banks. The major break with this came in 1852 with the passage of the free banking law. There were less than five banks in Tennessee until 1853, when the number began to rise. There were twenty-seven banks when the Panic of 1857 struck. Though thirteen of these closed because of this Panic, Tennessee's banking system was still over three times larger in 1860 than before 1853. Thus, Tennessee had a very different experience than the other states.

Tennessee's experience was distinct in that it did not go through a boom in banking during the early 1830s, like the other three states, but rather during the 1850s. Tennessee legislators did not easily approve charters and so the banking sector did not have much growth until after the free banking law was passed in 1852. Tennessee legislators also had imposed the lowest circulation ratio of the four states. These differences in the way in which Tennessee legislators ruled over their banking system lead to the differences in results of the counterfactual.

The Tennessee banking system was the least stable of the four states. The odds of a Tennessee bank closing were 6.3%, by far the highest of the four. Even so, if Tennessee had adopted the regulation of any of the other three states, these odds would have been even greater. Under Massachusetts's law, the Tennessee odds of closing would not have significantly increased. Under Ohio and Louisiana laws, the odds would have increased by 60.7% and 42.5%, respectively. These results are quite a bit higher than those for the other states. They certainly support the contention that local regulators were better than foreign ones. Even though the odds of closing in Tennessee were still high, they were much lower than other regulations would have caused.

Broken into subperiods, the counterfactual reveals when the other states' laws would have had the most impact. Ohio and Louisiana laws would have increased the odds of a Tennessee bank closing by at least 14.5% in the first and last decades of the antebellum period. As a general pattern the impact of Ohio and Louisiana laws would have been worse in the last decade of the period than in the first. The last subperiod was the one in which Tennessee experienced most of its bank losses and it is also the one in which Ohio and Louisiana laws would have had the most impact. It is surprising that the odds of closing could have been worse for Tennessee in the subperiod 1856-1860 because, under Tennessee law, the odds of closing were 13%. Ohio law would have increased the odds by 70.7% in the final subperiod and Louisiana law would have increased them by 55%. Hence, if Tennessee had had Ohio's regulation, the odds of a Tennessee bank closing would have been over 83% for the subperiod 1856-1860, by far the most astounding result of this research.

Ohio regulation had catered to maintaining fewer small banks earlier in the antebellum period. Louisiana's regulation maintained a system of many large banks early in the period. Both of these regulatory systems would have yielded increases in the odds of Tennessee bank failures because Tennessee legislators desired a tightly-controlled banking sector with very few large banks until 1851. In this year, Tennessee passed a free banking law, which created a very unstable banking system after the Panic of 1857. However, this instability would have been much worse for Tennessee's banks under Louisiana law, which was set up to sustain a smaller banking system composed of large banks at the end of the period, and under Ohio law, which maintained a bigger and varied system of small banks by the end of the period. Both Ohio and Louisiana laws had been

established to govern very different banking systems from that of Tennessee, which had few large, stable banks and several unstable free banks by the 1856-1860 subperiod.

Under Massachusetts's law, the results suggest that Tennessee's odds of closing still would have been higher but these results are only somewhat significant for the first two subperiods. The greatest impact of Massachusetts's law would have been to increase the odds of closing during the 1836-1840 subperiod by 7.2% above the 3% that it was under Tennessee law. After this subperiod, the increase that Massachusetts's law would have exerted is around 2.5% until the last subperiod when it falls to zero, as mentioned above.

Tennessee had an inherently unstable environment for banks. However, the system that the legislators established, with a few large dominant banks and strict circulation limits, appears to have been the best suited to Tennessee relative to the other three states. Although Tennessee regulation, according to this research, would have decreased the odds of failure in the other three states, it is a product of the regulation variable used here and cannot be interpreted as a better alternative for them. The other three states' legislators approved charters much more easily than Tennessee allowing their banking systems to expand quite rapidly in the early 1830s; yet, Massachusetts, Ohio and Louisiana all had lower odds of bank failure than Tennessee. Presumably, if Tennessee had allowed an expansion early in the period, its odds of failure would have been even higher then they were. This is evidence that the idiosyncratic nature of each state, known by the local regulators, can best dictate the optimal actions for each state's regulators.

The importance of the banking system to economic growth and the results of the bank failure model yield the question of why bank regulators would not simply enact laws strict enough to eliminate bank failures altogether. There are benefits and costs to regulations. The benefits of regulation include the mitigation of moral hazard and adverse selection in which banks could engage because monitoring is too costly for individual depositors. However, regulation that is too strict could result in total bank failure and prevent new banks from being established. The dire costs of regulation, then, would be losses to growth and state revenue. Regulators have for centuries been burdened with the task of not only determining the type of financial regulation to enact but also the appropriate amount.

The implications of this dissertation are not to suggest that any one of the conceptual models of regulation produces better outcomes than another. Rather the proposition is that there is no single optimal method of regulating banks, irrespective of time and place. Tennessee's banking sector remained stable under tight state control, suggesting the leviathan approach. However, under the free banking law, a public interest law, Tennessee suffered its greatest instability. Massachusetts had just the opposite experience. Its most troubled period of banking occurred after the legislature tightened its control in response to the Panic of 1837. The rest of the period's legislation, characterized best by the public interest approach, produced a thriving banking sector in Massachusetts. Louisiana's shift, post-1842, away from private interest and toward public interest and leviathan regulation resulted in a smaller, though stable, number of banks. However, the influence of banks was not completely eliminated from legislation (Green 1970). Ohio's most stable banking experience occurred after its 1845 law, which provided concessions

to the leviathan, public and private interests. The private interest that prevailed in Ohio in the 1830s contributed to the large number of failures. However, the public interest law of 1842 did not relieve the strain on credit access. It was the compromise in 1845 that led to Ohio's most successful banking experience. Clearly, motives for banking regulation changed in these states over time, which resulted in the varying degrees of success.

Although an optimal regulatory strategy that is independent of time and location may not exist, a broader implication of this research is that there may be optimal regulation areas. Many criteria could define these areas including type of economy, geographic endowments, religion and other cultural beliefs. The economy of a regulatory area would dictate the pattern of credit access that local borrowers need. Cultural beliefs would affect the area's attitude toward banking and identify the relative weights between the leviathan approach, public interest and private interest. The state level at which this research is assembled does not permit a county-level assessment of economies and culture. However, the changing features of regulation within the antebellum states illustrates that differences did exist with respect to these characteristics on a less aggregated level. The potential presence of optimal regulation areas suggests an appealing avenue for future research.

These intriguing results have generated many possibilities for a future research agenda. The most obvious extension of this work is to perform the same counterfactuals on all the states in the antebellum period. Wallis, Sylla and Legler (1994) dispute that regulators were achieving the best outcomes for their states. By their account, Pennsylvania was one of the most egregious examples of regulators abusing their power

in order to maximize revenue for the state. It would be interesting to see if the counterfactual methods employed in this research would substantiate their claim.

Another natural extension to this work would be to investigate how well the uniform regulations of the National Banking Act maintained banking systems within these diverse states. States without much political clout in the Union in 1863 (i.e. the seceded Southern states) did not explicitly contribute to the writing or passing of this Act. Therefore, their specific needs were not considered. This may have contributed to the reasons why the South fell so far behind the rest of the country for so long.

The relative impacts of banking regulation on bank performance are not only interesting subjects of research, but knowledge in this area can also have important implications for banking systems today. Developing countries may benefit more from having local regulators or consultations with them than as opposed to foreign ones, a lesson from which external financial aid programs could learn. Of course, corruption issues are always a possible problem but if the efficiency gains are large enough, alternatives to general uniform policies may be worth exploring. The Grameen Bank in Bangladesh, for instance, explicitly tries to utilize idiosyncratic characteristics of the population it serves to provide better service to its target clients. Other microfinancing institutions have emulated this model by learning what types of criteria the local people use in their borrowing decisions. Though these examples include societies that may base financial relationships more on social and cultural ties than on what developed countries would consider rational foundations, the premise of this dissertation is even more likely in these cases. It benefits the entire financial system if those who control the "rules" under which lending occurs are aware of the needs and concerns of those who are

borrowing. These same considerations apply to institutions, such as the World Bank and the International Monetary Fund, whose objectives are to supply credit to those who would not have access to it under normal market conditions. The creative solutions that lending institutions have managed thus far do not seem to be self-sustaining; lack of understanding local needs and desires may contribute to this.

Indeed, even developed countries still struggle with financial regulatory schemes. The pursuit of *the* universally optimal financial regulatory system may be a futile one. The experience of the antebellum banks provides a rich source for examining how a young country establishes and adjusts banking regulation. The examples of Massachusetts, Ohio, Louisiana and Tennessee provide useful and convincing evidence of the importance in assessing the relative value of local regulation.

APPENDIX A

CONSTRUCTION OF EXPLANATORY VARIABLE: BANK DENSITY

As explained in the main text, the bank density variable, *BDENS*, captures the level of competition that each bank is facing on a statewide level. The variable is the number of banks per 1000 white men in each year for each state. Annual population data are not available for the period 1830-1860. Therefore, in order to estimate the annual population of white men in each state, the decennial census population data from the antebellum period are used to estimate an exponential trend that yields an estimate of the annual series of the white male population in each state. These estimated trends and actual *BDENS* variable are in table A.

Year	MA		OH		LA		TN	
	pop.(1000s)	*BDENS*	pop.(1000s)	*BDENS*	pop.(1000s)	*BDENS*	pop.(1000s)	*BDENS*
1830	298.83	0.20	523.50	0.02	53.48	0.07	278.99	0.00
1831	305.81	0.23	538.60	0.03	55.84	0.11	282.93	0.00
1832	312.96	0.27	554.14	0.03	58.31	0.10	286.93	0.00
1833	320.28	0.31	570.12	0.02	60.89	0.15	290.98	0.00
1834	327.77	0.31	586.56	0.03	63.58	0.14	295.09	0.01
1835	335.43	0.31	603.48	0.04	66.39	0.15	299.26	0.01
1836	343.27	0.34	620.88	0.04	69.32	0.19	303.49	0.01
1837	351.30	0.35	638.79	0.04	72.39	0.21	307.78	0.01
1838	359.51	0.32	657.21	0.04	75.59	0.20	312.13	0.01
1839	367.91	0.31	676.16	0.04	78.93	0.19	316.54	0.01
1840	376.52	0.30	695.67	0.04	82.42	0.18	321.02	0.01
1841	385.32	0.29	715.73	0.03	86.06	0.08	325.55	0.01
1842	394.33	0.28	736.37	0.03	89.87	0.08	330.15	0.01
1843	403.55	0.25	757.61	0.02	93.84	0.07	334.82	0.01
1844	412.98	0.24	779.46	0.02	97.99	0.07	339.55	0.01
1845	422.63	0.24	801.94	0.02	102.32	0.07	344.35	0.01
1846	432.52	0.24	825.07	0.04	106.84	0.07	349.21	0.01
1847	442.63	0.24	848.86	0.04	111.57	0.06	354.15	0.01
1848	452.98	0.24	873.34	0.06	116.50	0.06	359.15	0.01
1849	463.57	0.25	898.53	0.06	121.65	0.06	364.23	0.01
1850	474.40	0.26	924.44	0.06	127.03	0.05	369.37	0.01
1851	485.49	0.26	951.10	0.06	132.64	0.05	374.59	0.01
1852	496.84	0.27	978.53	0.05	138.50	0.04	379.89	0.01
1853	508.46	0.28	1006.76	0.05	144.63	0.04	385.26	0.02
1854	520.35	0.29	1035.79	0.06	151.02	0.04	390.70	0.02
1855	532.51	0.31	1065.66	0.06	157.70	0.04	396.22	0.04
1856	544.96	0.31	1096.40	0.06	164.67	0.04	401.82	0.06
1857	557.70	0.31	1128.02	0.05	171.95	0.05	407.50	0.07
1858	570.74	0.30	1160.55	0.05	179.55	0.05	413.26	0.05
1859	584.08	0.30	1194.02	0.04	187.49	0.05	419.10	0.05
1860	597.74	0.29	1228.46	0.04	195.78	0.04	425.02	0.03

Table A.1: Explanatory variable *BDENS* and white male population estimates for each state

APPENDIX B

CONSTRUCTION OF EXPLANATORY VARIABLE: LOCAL ECONOMIC CONDITIONS

A great deal of effort went into constructing the explanatory variable *DEV*, which proxies for local economic conditions. As one would expect, there is no time series of gross state product for these four states during the antebellum period. However, it is important that the effect of local economic conditions be controlled for in the model. Therefore, in order to capture this effect, I have constructed the variable *DEV*. This variable is the annual percentage deviation from the trend of the value of production in each state. This appendix lays out explicitly how this variable was computed for each state.

The first step to constructing this variable is to assemble a basket of goods that accounts for the simple majority of production of each state. The choice of the baskets' components is determined from census data on agricultural and manufacturing output to comprise a simple majority of the state's gross product.[48] The goods in the basket remain the same from 1830 to 1860 but the weights change between the periods according the relative value of each good to the entire basket. For Ohio and Massachusetts, the 1850 Census does not provide the quantity data necessary to compute the weights in the

[48] Michael Haines also provided some raw data of production quantities that are in addition to the Census data.

production basket. Therefore, there are only 2 baskets (i.e. two different sets of weights) for the subperiods 1830-1845 and 1846-1860 for Massachusetts and Ohio. For Tennessee and Louisiana, there are 3 baskets for the subperiods 1830-1840, 1841-1850, 1851-1860 constructed from the 1840, 1850 and 1860 Censuses. The quantities of each good in this production basket establish the weights, or relative importance, of each good for each state. The items in these production baskets and their weights are listed in Table B.1

For Massachusetts and Ohio, the value of the 1840 and 1860 baskets are used to construct weights for the periods 1830 – 1845 and 1846 – 1860, respectively. This creates one composite series for the entire period but based on two differently weighted baskets. The weights are multiplied by the prices of these goods in that year taken from Arthur H. Cole's Wholesale Commodity Prices in the United States, 1700 – 1861: Statistical Supplement (Cole 1938). Cole provides prices from different cities including Boston, New York, Philadelphia, Charleston, Cincinnati, and New Orleans. The prices used for Massachusetts are Boston prices, or New York prices when Boston's were not given. The Ohio prices are Cincinnati prices. The weights multiplied by the prices provide the value of the production basket. These values are then adjusted for inflation using Warren and Pearson's price indices (Warren 1933). I then create an index of the production bundles' values based on 1845 by dividing the inflation-adjusted value for each year by the 1845 basket value and multiplying by 100. The resultant index for the period is based on the 1840 weights for the subperiod 1830-1845 and on the 1860 weights for 1846-1860. Then, a linear trend is fitted to each subperiod (i.e. 1830-1845 and 1846-1860), separately. The annual percentage deviations from this trend make up the covariate which proxies for local economic conditions, *DEV*, for Massachusetts and Ohio. Table B.2 provides the

actual values of *DEV* used in the empirical model. Figures B.1 and B.2 illustrate this variable, which represents local economic conditions, for Massachusetts and Ohio, respectively.

In the cases of Louisiana and Tennessee, the process is similar to the one already outlined. For these states, the value of the 1840, 1850 and 1860 baskets are used to construct weights for the periods 1830-1840, 1841-1850 and 1851-1860, respectively. This creates one composite series for the entire period but based on three differently weighted baskets. The prices for Louisiana are Cole's New Orleans prices. For Tennessee, the Cincinnati prices are used. As with the other two states, the weights are multiplied by the prices to obtain the value of the production baskets. These values are then adjusted for inflation and converted to indices based on 1845, in the same manner as described above. The resultant index for the period is based on the 1840 weights for the subperiod 1830-1840, on the 1850 weights for 1841-1850 and on the 1860 weights for 1851-1860. Once again, a linear trend is fitted to each subperiod (i.e. 1830-1840, 1841-1850 and 1851-1860), separately. The annual percentage deviations from this trend comprise the covariate, *DEV*, for Louisiana and Tennessee. The actual values for this variable are provided in table B.2 and figures B.3 and B.4 illustrate this variable for Louisiana and Tennessee.

Massachusetts		Ohio		Louisiana		Tennessee	
Basket	**Weight**	**Basket**	**Weight**	**Basket**	**Weight**	**Basket**	**Weight**
Hay		*Wheat*		*Sugar*		*Wheat*	
1830-1845	0.14	1830-1845	0.27	1830-1840	0.43	1830-1840	0.042
1846-1860	0.10	1846-1860	0.17	1841-1850	0.73	1841-1850	0.011
				1851-1860	0.40	1851-1860	0.025
Corn		*Corn*		*Corn*		*Corn*	
1830-1845	0.011	1830-1845	0.55	1830-1840	0.021	1830-1840	0.42
1846-1860	0.012	1846-1860	0.57	1841-1850	0.033	1841-1850	0.34
				1851-1860	0.31	1851-1860	0.24
Manu. cotton goods		*Raw wool*		*Raw cotton*		*Raw cotton*	
1830-1845	0.41	1830-1845	0.06	1830-1840	0.55	1830-1840	0.26
1846-1860	0.48	1846-1860	0.082	1841-1850	0.23	1841-1850	0.51
				1851-1860	0.57	1851-1860	0.54
Manu. woolen goods		*Tobacco*				**Tobacco**	
1830-1845	0.18	1830-1845	0.097			1830-1840	0.28
1846-1860	0.24	1846-1860	0.19			1841-1850	0.13
						1851-1860	0.20
Manu. leather goods		*Flour*					
1830-1845	0.26	1830-1845	0.021				
1846-1860	0.16	1846-1860	0.38				

Table B.1: Types and weights of goods in production baskets for *DEV*

Year	MA	OH	LA	TN
1830	8.82	-9.80	0.28	-9.36
1831	7.14	5.44	-15.56	9.06
1832	-2.02	17.04	-7.48	4.59
1833	-1.59	-10.61	2.11	-12.05
1834	2.63	-10.42	9.08	-2.52
1835	-0.49	4.25	23.22	15.95
1836	-6.79	-5.10	17.78	-9.71
1837	-10.67	10.99	-9.33	-1.79
1838	-9.95	15.04	-6.74	8.88
1839	-7.38	8.10	-7.97	19.27
1840	-0.88	-22.73	-5.61	-22.34
1841	1.72	-8.10	-5.19	-2.80
1842	5.44	-6.22	-0.19	-1.76
1843	3.17	4.97	3.05	-1.58
1844	8.72	7.67	7.73	14.23
1845	2.28	-0.47	-8.06	2.28
1846	6.80	-0.34	13.38	-4.31
1847	-1.71	3.71	4.71	-2.12
1848	1.54	9.76	-19.38	-8.17
1849	1.88	6.32	-6.76	-6.22
1850	4.87	5.37	10.67	10.45
1851	5.14	-13.21	21.91	10.87
1852	-0.60	-24.47	1.43	-10.31
1853	-3.27	-7.36	-5.53	2.08
1854	-7.13	6.74	-23.66	-4.81
1855	-7.18	18.02	-15.01	2.37
1856	0.40	-3.25	4.81	-6.15
1857	3.39	-9.11	10.88	-1.43
1858	6.96	-7.91	5.28	0.65
1859	4.29	19.53	3.30	18.20
1860	3.40	-3.66	-2.79	-11.38

Table B.2: Explanatory variable, *DEV*, for each state

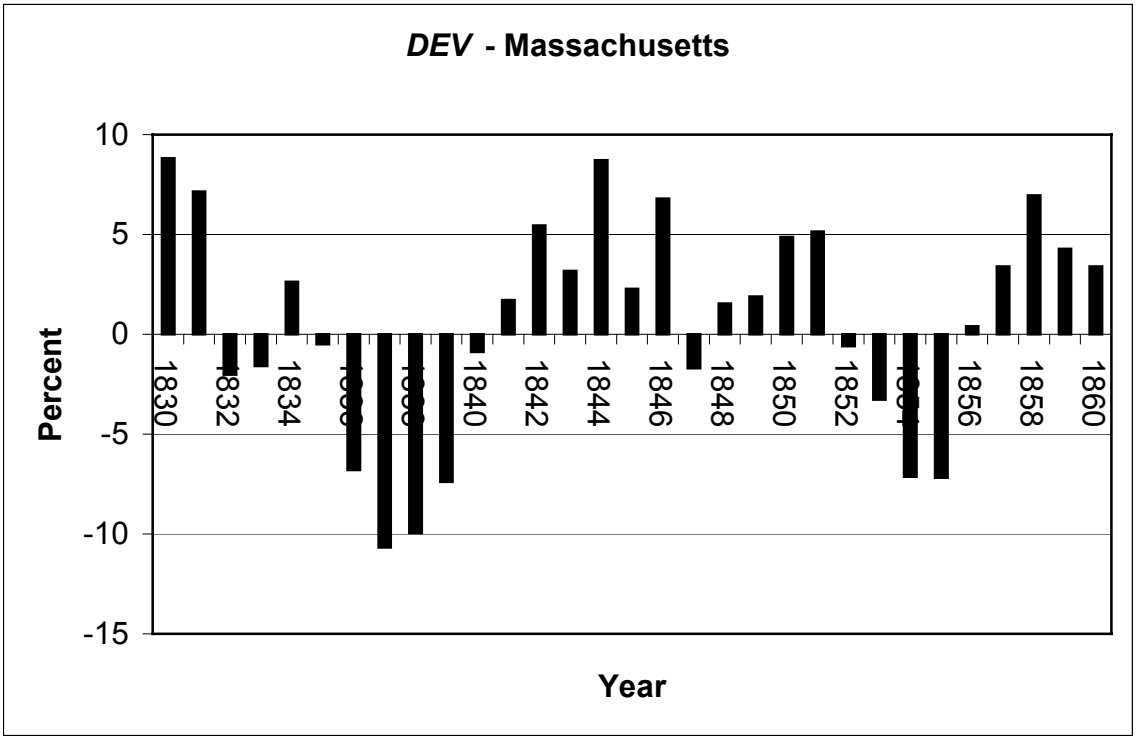


Figure B.1

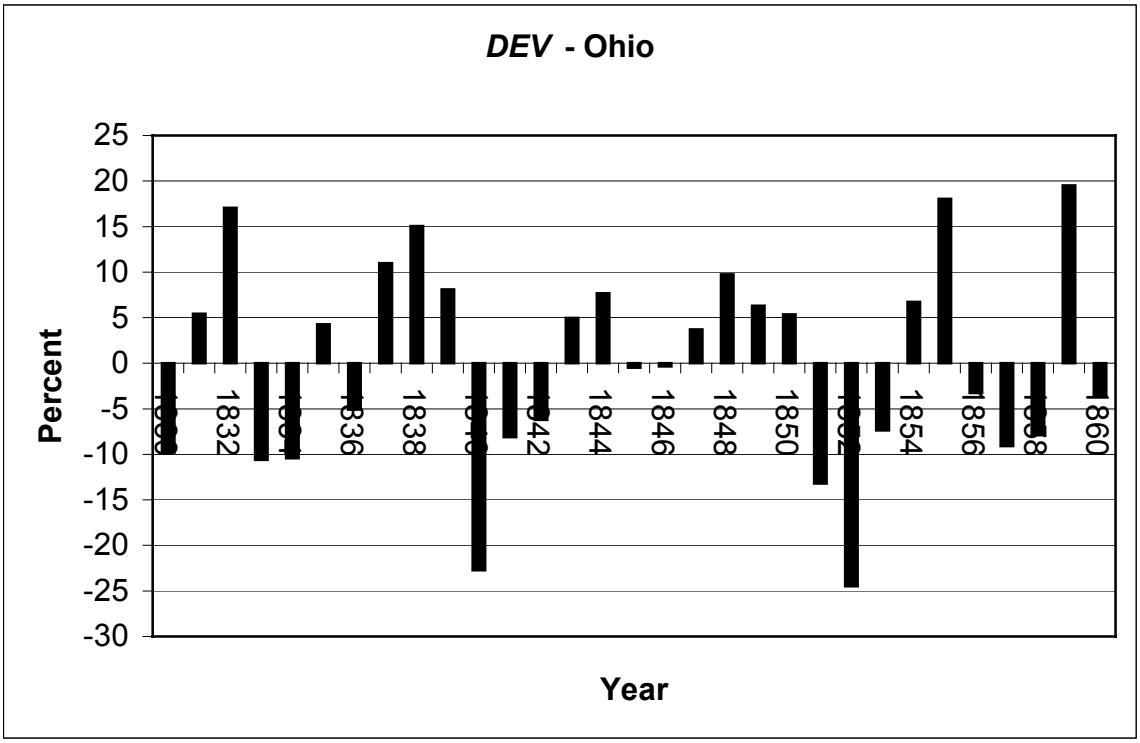


Figure B.2

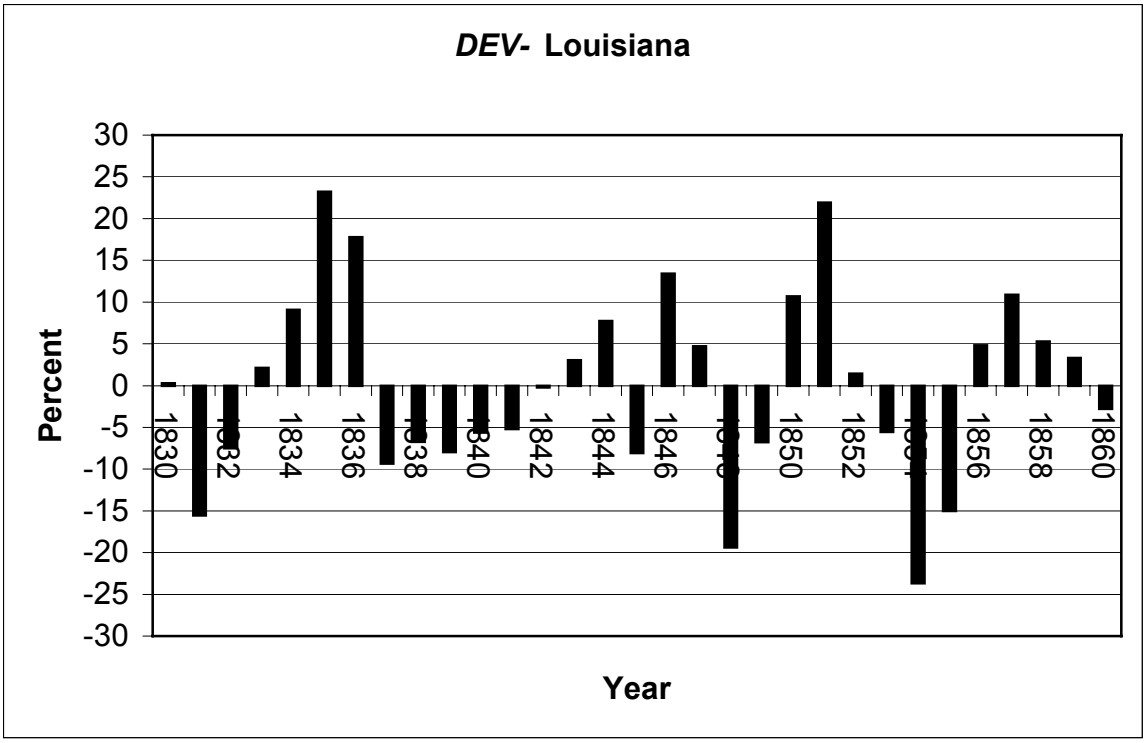


Figure B.3

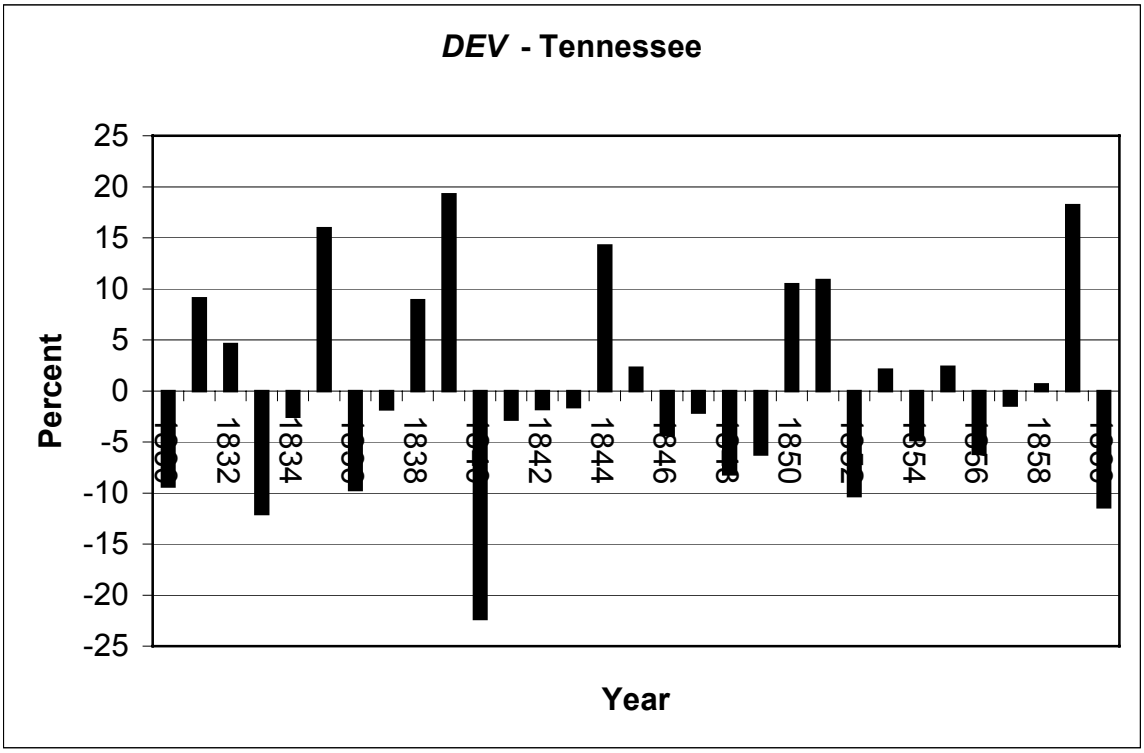


Figure B.4

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