

Credible commitments and constitutional constraints: state debt repudiation and default in nineteenth century America

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Abstract Between 1839 and 1842 the United States suffered through an acute debt crisis. Over this period, eight states and one territory defaulted, five of which outright repudiated all or parts of their outstanding debts. However, for many of those same states, reentry into capital markets occurred relatively rapidly and at rather favorable terms. The question then arises, how and why was this possible? This work attempts to explain this phenomenon by suggesting that soon after default or repudiation many states enacted constitutional amendments meant to significantly constrain and credibly commit future governments from overextending credit and simultaneously to pursue time-consistent public policy. I explore this by examining the impact that these newly imposed constitutional amendments, which limited both the type and amount of debt and created stronger procedural safeguards for issuing debt, had on average bond prices, gathered from New York market data. Overall, my results show that newly constrained states had higher average bond prices than states that did not impose constitutional limits on debt financing, suggesting that markets did, in fact, perceive these constitutional changes to be binding and credible.

Keywords Sovereign debt · Default · Credible commitments · Constitutional constraints

JEL Classification D78 · H63 · H73 · N41

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1 Introduction

The recent events that have unfolded within the financial sector have increasingly led to significant economic difficulties for the public sector both internationally and domestically. In the United States this has created a depressed situation for many junior and state level governments. Specifically, the financial crisis has resulted in a precarious situation for state budgets and fiscal positions. Most telling of this the online prediction market, In-Trade, has set up markets in the event that the states of California, Illinois and New York would default on their own sovereign debt obligations.¹

These events have also played out within the federal government through the intense debates and last minute vote involving the debt ceiling and the subsequent downgrade of the US sovereign debt by the rating agency Standard and Poor's. These debates also brought forth discussion of a possible balanced budget amendment to the US Constitution, which has followed in the wake of Spain's recent constitutional balanced budget amendment meant to cope with its increasing sovereign debt problems.

Although neither a state government nor the federal government has defaulted yet, this nevertheless brings to light the relevance and importance of credibly committing a government to pursue time-consistent policy into the future in order to avoid such an outcome (Kydland and Prescott 1977; North and Weingast 1989). In light of the recent financial events and their impact on sovereign governments, this study is an attempt to examine the significance of constitutional change and entrenchment as a means for a post-default sovereign state to demonstrate a credible commitment. I do this by analyzing the issue from a historical context when, between 1839 and 1842, the US states suffered through an acute debt crisis resulting in eight states and one territory defaulting on their sovereign debt obligations. Five of these outright repudiated all or part of their outstanding debts. This led to massive upheaval within state governments, resulting in thirteen states drastically amending or adopting entirely new constitutions by 1850, with another seven states creating explicit constitutional provisions in regard to sovereign debt by 1857. Most of these changes dealt specifically with the issue of sovereign debt, and provided a set of binding constraints which, I argue, conveyed a credible commitment to creditors of a state's willingness to repay all post-default debt obligations.

I examine the impact that numerous constitutional amendments had in the aftermath of state default and repudiation through historical evidence as well as from difference-in-averages and cross-sectional pooled OLS regression analysis using data from the New York Stock Exchange between 1850 and 1860. Overall, I find strong evidence to suggest that those states that adopted a set of constitutional amendments requiring strict limits on the amount and type of debt as well as strict procedural safeguards for the issuance of debt saw a significant increase in their average bond prices relative to those states that did not implement similar constitutional constraints. The results hold for both defaulting and non-defaulting states.

¹ Information is freely available at www.Intrade.com.

These constitutional limitations seem to have created the necessary commitment for states to again obtain external credit and financing as these constraints, although they did not always totally remove the ability for states to issue debt, made it both extremely difficult to do so and also set strict requirements pertaining to the repayment of that debt. The evidence would suggest that instead of simply statutorily mandating the changes contained within the constitutional amendments, states instead undertook the timely and costly process of amending their constitutions, suggesting that it was meant as a means to convey an “over-commitment” to future policy (Rodrick 1989). Finally, I consider these constitutional amendments in the context of today, providing a discussion of the seeming constitutional erosion that has occurred over time within the states of New York, California and Illinois (those states considered the most prone to potential default by In-Trade) and its potential impact on sovereign debt policy in general.

The remainder of the paper is structured as follows: Section 2 provides a brief review of the relevant literature. Section 3 lays out an historical overview of early American debt history, before and up through the state debt crisis of the early 1840s. It then carries the analysis further by considering the constitutional changes that occurred after the crisis regarding public indebtedness through the late 1840s and 1850s. This section spells out how these changes may have conveyed a credible commitment regarding future debt obligations. Section 4 lays out the empirical examination, results and an interpretation of those results. It also provides an analysis of the current situation faced by sovereign governments as well as potential policy implications. Section 5 concludes.

2 A brief review of the relevant literature

How to credibly commit a government to a given set of pre-specified policy goals through time has been a frequently considered concept in the literature. Protecting and enforcing property rights, rather than expropriating property, has been one of the most important issues explored (North and Weingast 1989; North 1991; Weingast 1993, 1995; Frye and Shleifer 1997; Frye 2004). Specifically, the problem becomes one of setting up an institutional framework that minimizes the risk of expropriation by a government or sovereign. In other words, a government must find a way to convey a specific commitment to individuals that it will protect rather than confiscate private property.

In general, two means have been suggested by which a government may actually commit itself to a given policy into the future: (1) through precedent, by conveying its commitment to the policy based on adherence to it in the past; and (2) through a set of binding constraints or rules making it impermissible to violate the given commitment (North and Weingast 1989). Although reputational effects created by the first policy can theoretically convey a credible commitment (Barro and Gordon 1983; Diamond 1989), it has been suggested that in reality, as erosion of political constraints emerges, it makes breaching the commitment inevitable, or at least far less costly (North and Weingast 1989).

This suggests that some set of binding constraints must be erected that force a sovereign or government to credibly commit to the desired policy. Scholars have suggested that by establishing institutional constraints through some type of higher or constitutional law, and thus divorcing general debate over the proposed commitment from the everyday political marketplace, a country more rapidly reaps the fruit of economic growth (Elkins et al. 2009). As the commitment moves to this higher order, constitutional law, it increases the probability that it will become both binding and self-enforcing, as it may create a set of incentives necessary for political actors to better respect the constraint moving into the future (Weingast 1995).

In a similar vein, Kydland and Prescott (1977) argue that binding rules are necessary in order to credibly commit governments to long-term, time consistent policies. Specifically, the issue becomes one of creating an environment in which economic actors are able to formulate expectations about future policy outcomes. Overall, this requires political actors to announce an initial set of credible policy goals, which allows individual actors to set up the necessary expectations to carry forward into the future, thus leading to sustainable and predictable outcomes.

A further path to creating credible commitments is to find the means by which to create a set of incentives that provide the necessary foundation for political leaders to build long-term reputations (Myerson 2007). In this manner, it has been suggested that a system of federalism creates the very incentive for both reputation building and also for the creation of time consistent policies (Weingast 1995; Wibbels 2003). Essentially, the discipline created by inter-jurisdictional competition checks governments and political leaders from deviating or breaching previously agreed upon promises, as doing so could provide neighboring jurisdictions a competitive advantage and may cause citizens to simply “vote with their feet” and exit the jurisdiction (Tiebout 1956; Inman and Rubinfeld 1997).

A more serious concern is how to recommit to a given policy or goal once a government reneges on its prior arrangements. One feasible means to return to a steady-state equilibrium is for a government to “over-commit,” or overshoot future policy goals (Rodrick 1989). In this way, a government signals to economic actors its willingness to bind itself even further than might be necessary, as opposed to a government that would prefer to again renege on its pre-specified agreements. Thus, over-commitment by a government after defection may send the necessary signal of its credibility to individuals within the marketplace.

It is within this context that we observe the situation of the American states during the debt crisis between 1839 and 1842. Many had defaulted or outright repudiated and were heavily penalized for that decision either through no access to capital markets or access at extremely high prices. However, the necessary incentives were also in place to push these states to bind themselves in a much more forceful fashion than had been previously needed. As such, these states quickly self-imposed new constitutional constraints in order to rebuild their reputations and to send the necessary signal of credibility to both foreign and domestic capital markets that those very governments again would adhere to long-term, time consistent policy. The next section provides an historical overview and examination of the credibility issues at hand.

3 A brief history and constitutional analysis

Unprecedented economic growth began in the latter half of the 1820s and continued well into the 1830s in the United States. Over this period, there was also a large influx of public aid that poured into the economy from various state governments. Much of this public assistance came as a direct result of the initial success with New York's foray into the construction of the Erie Canal. This success led many state governments to provide massive public support for both internal improvements (generally railroad and canal projects) and banking institutions, the latter again driven by the success of New York's investments in many of its own banks. For instance, by the 1820s New York was earning more than \$100,000 a year from the dividends paid out by the banks in which it had invested (Wallis et al. 2004). This encouraged many other states to pursue a similar course, most notably in the South, as bank investment was considered a relatively low-risk investment that provided a potentially large return. For example, when Louisiana chartered the Union Bank in 1832, the British financial firm, Barings, purchased the entire state bond issue at a large premium, with the expectation that the bank would net a handsome return (Wallis et al. 2004).

Generally, it was the southern states that would invest in banks, while northern states largely targeted funding toward internal improvements (Ratchford 1941). In order to finance these undertakings states began implementing systems of "taxless finance" whereby instead of resorting to direct taxation (most states at this time had no direct taxes levied on citizens), states would issue large amounts of debt. The proceeds of these sales, if sold at a premium, would be used to cover interest payments as they came due, or would simply issue more debt in order to cover interest payments otherwise (McGrane 1933; Ratchford 1941; Wallis 2000). In this manner, state governments hoped to avoid the need to tax citizens in order to finance these projects and to then wait for the completion of those projects to become profitable, thereby paying down the debt incurred with those proceeds (Ratchford 1941). Further, ever-rising land values throughout the 1830s also increased the desire for debt funded investments in internal improvements and banking institutions as, in the extreme, it was believed that states had a more readily available taxable base, real property, in the event that difficulties arose in meeting debt obligations (Wallis et al. 2004). Overall, between 1830 and 1840 total indebtedness of the states incurred to finance banking institutions and internal improvements had increased by almost \$178,500,000 (Porter 1880).

Most telling of this growth in public indebtedness, of the nine states that eventually fell into the most dire financial situations, for eight of them, Pennsylvania, Maryland, Indiana, Illinois, Michigan, Arkansas, Florida and Mississippi, total indebtedness in 1830 was just under \$7,000,000, ballooning to almost \$95,000,000 by 1840 (Curtis 1844). Although for a time this system of "taxless finance" remained sustainable, the first signs of what was to come began with the onset of the panic of 1837, when many states, especially those in the West, had just begun passing legislation to finance their own internal improvements.

Newer states in the West and South had invested large sums in state-sponsored endeavors and were placing large bond issues into the market. During the first half

of the 1830s westward expansion and increases in economic activity had led to ever increasing land values, with the value of real estate rising by 150% between 1830 and 1837 (McGrane 1965). However, this increase in land values was slowed first in July of 1836 with the passage of President Andrew Jackson's Specie Circular, which required payment in specie for all public land sales. This legislation was coupled with a tighter credit policy adopted by the Bank of England and a downturn in cotton prices in the United States which culminated in the panic of 1837. The result was a general suspension of specie payments by banks throughout the country for nearly a year (McGrane 1965). Overall, the panic by-and-large did not exclude states from external credit sources; however, it did require that many times they accept discounts on the bonds they did issue.²

Although the panic of 1837 created a small setback and should have sent a warning signal to state legislatures, it was short-lived. By 1838 the economy had begun to rebound and states continued to pour debt funded aid into the economy. Specifically, between 1837 and 1841 well over half of the nearly \$200 million in outstanding state debt was incurred (Kim and Wallis 2005). Unfortunately, a much more severe depression beset the country in 1839, lasting into 1842.

Whereas the panic of 1837 disproportionately affected banks within New Orleans and the Northeast, the crisis of 1839 was more focused within the banking industries of the southern and western states (Wallis 2001). Unfortunately, it was states in these regions that were relatively heavily invested in their banking institutions as compared to the rest of the country. Thus, whereas the panic of 1837 had a much smaller effect on state fiscal positions, the crisis of 1839 proved otherwise. With western and southern banks financially constrained, state fiscal positions became much tighter, which rapidly led to a downward spiral as bank failures led to sovereign debt problems.

It was over this period that many states found themselves in financially precarious positions or, for a number, became financially insolvent. By 1842, most states had halted all internal improvement projects, realizing they were either unprofitable or unobtainable. Many of the state banks, whose capital was backed by the credit of their respective state, became insolvent and subsequently dissolved, leaving those states directly liable for all outstanding debts that had been incurred.

As a result of these events, by 1842 eight states and one territory defaulted on their interest payments, with five partially or outright repudiating their debt obligations. These events unfolded in 1841 first when Pennsylvania delayed interest payments, followed by Indiana, Florida and Mississippi all defaulting. This led to serious concerns within the sovereign debt market and a subsequent domino effect as Arkansas and then Illinois, Maryland, Michigan, Louisiana and finally Pennsylvania fell into complete default (Ratchford 1941). Of those states, Florida, Mississippi, Arkansas, Michigan and Louisiana either totally or partially repudiated

² Although the causes and consequences of the panic are still debated today and would require work well beyond the scope of this paper to fully explain them, it is known that most of the sovereign borrowing that did occur through this period happened between 1837 and 1841. Thus, this would suggest the panic of 1837 affected banking much more so than sovereign debt. In fact, it appears that Maryland, which placed an \$8 million loan on the market in the middle of the panic, was the only state unable to find a ready buyer for its bonds.

their debts. The states that remained solvent were only able to do so by curtailing state subsidization of their internal improvement projects, by imposing new taxes on their populous, by placing new debt issues on the market at heavy discount, or through some combination of the three (Wallis 2005). For example, in 1842 New York passed its “stop-and-tax” legislation which indefinitely halted all internal improvement construction in the state and also placed a 1 mill tax on all taxable property.

Over the next several years states were forced to take drastic action and abandon many of the projects they had initially started in the 1830s; sell off large portions of those projects to private interests (as in the case of Michigan and Indiana); attempt to restructure their outstanding debts with creditors (Indiana and Illinois); and/or impose new statutory tax laws on the populous within those states, generally through increased property or poll taxes, in order to fund their external debt obligations (Wallis 2000).

The direct result in the aftermath of this debacle was a complete revulsion against internal improvements in many states (Goodrich 1950). This led to calls for new constitutional measures to deal directly with the issue of state indebtedness. In effect, these became the first set of constitutional debt limitations that states imposed on themselves in American history. Many prominent figures within the states made reference to the importance of restricting state debt through constitutional and legislative change. For example, then Democratic governor of Indiana, James Whitcomb, in his message to the legislature of 1848 suggested:

It is also to be desired that the constitution should be amended, as to prohibit the creation of any public debt, except under restrictions as to amount, and object. Years of prosperity may cause the severe lesson we have been taught on this subject to be forgotten, and we cannot too strongly guard against a recurrence of similar improvidence.

Akin to this, in principle and policy, would be an amendment requiring, for the passage of every bill granting money from the treasury, or public property to individuals, a majority of two-thirds, in each house, of all the members elected. (*House Journal* 1849).

This was also echoed by the Democratic party platform in the state, when on January 8, 1849 the first resolution passed by the party was a complete prohibition on the contracting of debt, unless full appropriations were to be made simultaneously in order to pay down both interest and principal, and only after the proposal was met with the approval of the citizens of the state (*House Journal* 1849). These proposals were not just partisan issues at the time; the state’s Whig platform echoed that of the Democratic Party. The Whig position was a complete prohibition on the state from ever contracting debt, unless it met the approval of a majority of the citizens of the state (*House Journal* 1849).

Not only were calls for such measures found across parties, they also cut across states in regard to both the debt issue and constitutional change. In Maryland, as early as 1840 calls were made to rein in spending and find ways to pay down the outstanding debt. For example, then Democratic governor William Grason in his annual messages stated:

I do not perceive how [the redemption of the public debt] can be effected, without resisting the further issue and hypothecation of State stock; reducing the public expenditures by a rigid system of economy, and increasing the revenue by a moderate tax on real and personal estate, till it is sufficient to pay the interest, and leave a small surplus to be applied to the principle of the debt. (*House Journal 1840*).

These measures were similarly called for within the state until the eventual constitutional changes that emerged.

Further, John J. Crittenden, the Whig governor of Kentucky and eventual Senator of the state, in his message of 1848 not only strongly supported a constitutional convention, but also suggested that measures be put in place that would carry forward efforts that had been implemented to extinguish the debt and grow the economy:

The course of legislation for the last few years indicates, clearly, the popular will that nothing should be done to diminish the power of the State to redeem, at maturity, her out-standing bonds, and to meet, with unwavering promptness, every payment of interest at the places and times when and where they may fall due... and [I] will not take it upon myself to recommend any measure that may hazard that sound principle – a principle as important for the good name of a State as of an individual... To your better judgments, however, such subjects may be more properly submitted, and it is not appropriate to my office to say any thing more than to promise my hearty co-operation in any measures that will promote the general interest without encroachment upon the resources that are necessary to extinguish liability already incurred. (*Senate Journal 1848*).

Finally, Silas Wright, former Democratic governor of New York and strong supporter of the state's proposed constitutional amendments, suggested in his annual message that:

The recent free use of the public credit, in over-hastening loans for State works, and in lending to irresponsible corporations, the embarrassed condition of our finances, and the consequent call for direct taxation to restore public confidence, have doubtless given rise to these proposed [constitutional] amendments. (*Senate Journal 1846*).

Indeed, it would appear that the issue of New York's indebtedness was a driving factor for the constitutional convention (Galie 1991). In fact, the state's constitution of 1846 had twenty-two provisions that specifically restricted the legislative powers over taxation, the appropriation of money and several other similar subjects (Galie 1991). Overall, this anecdotal evidence would at least suggest that constitutional change tied to public finance were major issues through the 1840s not only across state lines, but party lines as well. Further, the issue of state finances and debt, if it was not the primary reason was a major reason cited for the constitutional conventions of the 1840s and 1850s.

In total, twenty states between 1840 and 1860 adopted some set of new constitutional constraints that had explicit measures dealing with public indebtedness. As suggested, I argue that these constitutional constraints conveyed the necessary credible commitment to creditors regarding a state's propensity to repay any future debt incurred post-crisis and post-default. This was especially important for those states that had defaulted or even repudiated some portion of their debt obligations.

Although the constitutional amendments that emerged varied slightly in degree and scope among states, four were relatively consistent. Specifically, the first amendment was a constraint on the lending of the individual state's credit to a private interest or corporation. As noted, many states, especially those located in the South, had guaranteed the debt incurred by numerous banks and other corporate bodies. For example, in 1833 the then Territory of Florida chartered the Bank of Pensacola. As part of the charter, the bank was authorized to issue \$500,000 in bonds, which were subsequently endorsed and backed by the credit of Florida (Scott 1893). In return, the state received both mortgages as collateral in the event of liquidation as well as regular dividend payments. However, by 1843, due to overinvestment in several railroad operations, the bank became insolvent and soon after was liquidated. This left the Territory of Florida fully responsible for the outstanding debt of the bank. Rather than pay the creditors of the bank, as stipulated in the original charter, the territory simply reneged on its agreement and repudiated the debt. This practice was also carried out by Mississippi, Arkansas and Louisiana when several of their respective banking institutions followed a similar path.

The second major constitutional change that numerous states adopted was a prohibition on the purchase of private, corporate stock. Many debt issuing states had originally stipulated that any bonds they placed on the market could not be sold below par. However, when market conditions prevented a sale at or above par, states would simply exchange those bonds at par for corporate stock or bonds of various internal improvement companies (Ratchford 1941). The logic being that as the internal improvements became profitable these states would be able to tap those firms as a self-sustaining revenue source (much as the Erie Canal had done for the state of New York) and from this pay off any remaining outstanding debt. Unfortunately, as those corporate bodies failed during the crisis and the internal improvements never materialized, it left many states with no revenue source to pay down the outstanding debt.

The third major constitutional change that I consider is whether a state implemented a specific voting procedure before it could issue debt. Prior to the crisis most states only required a simple majority of both houses of their respective legislatures to vote in the affirmative along with a gubernatorial signature in order to issue debt. However, after the crisis many states implemented radically different voting procedures, which mandated a supermajority of both houses of a state's legislature, a majority vote of the general population, or both before a state could issue debt. This radically altered the ability to issue debt by making it much more difficult and politically costly to do so. For instance, Illinois' Constitution not only required a two-thirds vote of both houses of the legislature in order to issue any debt, the total debt that could be issued in 1 year could not exceed \$50,000 unless it

was for war purposes or if, at a general election, a majority of the state's citizens voted to authorize a larger issue.

The final constitutional amendment I consider is whether a state imposed a time limit on the repayment of debt. Prior to the crisis no state had a statutory limit on the time to repay its debt, although the majority of debt issued over the period was generally payable after 20, 30, or 40 years depending on the issue and the state (Ratchford 1941). However, these amendments severely restricted how long a debt could remain outstanding, which greatly reduced the uncertainty inherent in longer-term debt issues. For example, Maryland stipulated that both interest and principal were to be repaid within 15 years, whereas prior to that the state had no repayment requirements.

Table 1 provides a list of each of the states that imposed some or all of these constitutional restrictions at some point between 1840 and 1860.

As can be seen from the table, thirteen states had adopted a combination of these amendments on or before 1850, with the remaining states doing so at some point after. Thus, a large number of states actually adopted many of these amendments at a time when, although they may not have been under a state of default, several other states (including Illinois, Indiana and Maryland) were. From this it would appear that signaling credibility to both foreign and domestic credit markets may have been a main concern for many of these states. Overall, I conjecture that if these constitutional amendments did in fact provide the necessary credible commitment to potential creditors into the future, then they would have a clear positive impact on a state's bond prices. Therefore, I next test this conjecture under a number of specifications to see the impact that these constitutional amendments may have had on state debt and bond prices.

4 Data, methodology and analysis

4.1 Data and model specification

In order to further analyze the impact that these constitutional amendments may have had I have compiled bond price data from a number of sources between 1850 and 1860. The first comes from Sylla et al. (2006).³ These data provide comprehensive price quotations for the largest domestic markets of the time. Specifically, their work compiles bond price quotations from a number of primary sources for various state bonds on a daily, weekly, or monthly basis, depending on the frequency with which those bonds traded within the various markets.⁴ This current work employs data from the New York market, as domestic bonds of the time were traded relatively heavily in New York. A second dataset has been incorporated from Dwyer et al. (1999). This database gives weekly bond price data as traded in New York City between 1855 and 1865 for all major states available.

³ This data is freely available at <http://www.eh.net/databases/early-us-securities-prices>.

⁴ All bonds traded during this time had a par value of \$100.

Table 1 Constitutional changes imposed by state and year between 1840 and 1860

State	Amendment					
	No lending credit	No purchasing stock	State debt limits—voting procedure	State debt limits—time limits on repayment	Default	Repudiate
Michigan	1850	1850	1843		Y	Y
Louisiana	1845	1845	1845		Y	Y
New York	1846		1846	1846	N	N
Illinois	1848		1848		Y	N
California	1849	1849	1849	1849	Y	N
Kentucky	1850		1850	1850	N	N
Virginia	1850			1850	N	N
Maryland	1851	1851		1851	Y	N
Indiana	1851	1851			Y	N
Ohio	1851	1851			N	N
Pennsylvania	1857	1857			Y	N
New Jersey	1844		1844	1844	N	N
Rhode Island	1842		1842		N	N
Texas	1845	1845	1845		N	N
Iowa	1846	1846	1846	1846	N	N
Wisconsin	1848				N	N
Maine	1848				N	N
Kansas	1855	1857	1855	1855	N	N
Minnesota	1857				N	N
Oregon		1857			N	N

Column (1): No lending credit = a prohibition on the state from ever lending its credit on behalf of a private corporation or interest

Column (2): No purchasing stock = a prohibition on the state from ever purchasing the stock of a private corporation

Column (3): State debt limits—voting procedure = a procedural safeguard requiring either a supermajority of both houses of a state's legislatures and/or a majority vote of the general electorate

Column (4): State debt limits—time limits on repayments = a specified period of time within which any debt issued must have both interest and principal retired

Additionally, to fill in as much missing data as possible after incorporating the two datasets above, I have compiled bond price observations for the New York market between 1850 and 1855. This comes from a number of sources, including *The New York Tribune*, *The New York Times*, *The Bankers' Magazine and Statistical Register* and *Hunt's Merchants' Magazine and Commercial Review*. In all, this current dataset should provide the most comprehensive list of bond prices as they traded in New York between 1850 and 1860.

To investigate the impact that the various state constitutional amendments may have had on a state's bond price, I first analyze the difference-in-averages for three separate cross sectional years in intervals of five years, looking at states that adopted

each of the constitutional amendments mentioned above against those states that did not for the years 1850, 1855 and 1860. I also include the results for states that defaulted in the sample versus states that did not. For each of those years I base the dependent variable on the maturity rate for each state's bonds that traded on the New York Stock Exchange for the month of October.⁵ I chose the month of October for a number of reasons. First, all constitutional amendments adopted in 1850 were done so prior to October of that year. Second, for the three cross-sections analyzed, the month of October provides the largest number of data points. Third, over the period from which I pull the data there is very little fluctuation in the price for bonds that were regularly traded; thus I am able to incorporate several relatively less heavily traded state bonds. Table 2 provides the results.

Here the results indicate that for those states that adopted a specific constitutional amendment, the average bond price was, indeed, higher than for those states that did not (except for the prohibition on the purchase of stock in 1855 which was only slightly negative, and a time limit on the repayment of a state's debt), averaging from a low of \$1.34 for states that prohibited the purchase of private stock in 1850 to a high of \$14.12 for states that restricted the lending of credit in 1850. Further, states that were able to avoid default generally also saw much higher average bond prices. This result holds for each of the years analyzed, 1850, 1855 and 1860, though the statistical significance seems to dissipate over time. However, the low statistical significance may be a function of low sample size, and thus is still suggestive of economic significance. Specifically, with only twenty-one observations in 1855 representing eleven states and twenty-three observations in 1860 representing seventeen states, this still provides observations for 54% and 65% of all of the states which had any outstanding debt during each of these years respectively.⁶

Given this, as a means to overcome the low sample size problem, I also report a number of cross-sectional pooled OLS regression estimates. The baseline model takes the form

$$BondPrice_{it} = \alpha + X'_{it}\beta + Z'_{it}\delta + \varphi_t + \varepsilon_{it} \quad (1)$$

$t = 1850, 1855, 1860$. Here $BondPrice_{it}$ is the bond price based on the maturity rate of each bond for state i in the associated year t . X'_{it} is a vector of the five explanatory variables discussed above, four of which are the specific constitutional amendments adopted (coded as a 1 if a state had the constitutional amendment and 0 otherwise), while the fifth explanatory variable is whether or not a state defaulted on its debt

⁵ By breaking down each bond by the maturity this allows me to increase what is a relatively low sample size, as some states issued multiple bonds which matured at different times. This also allows me to better account for the inherent risk associated with different bonds as, *ceteris paribus*, a bond maturing at a later date will be relatively more risky which will thus affect its price. For robustness I will later change this assumption.

⁶ In 1855 there were only 31 states in the Union, growing to 33 by 1860. Along with this, in 1855 the states of New Hampshire and Wisconsin had negligible debts of \$75,000 and \$100,000 respectively making the effective number of states with any substantial debt at 22. In 1860 New Hampshire still only had a negligible debt of \$50,000, leaving the effective number of states with any substantial debt in that year at 25.

Table 2 Difference-in-averages results between those states that had imposed or had not imposed the listed constitutional amendments

Year	Amendment	No lending credit	No purchasing stock	State debt limits—voting procedure	State debt limits—time limits on repayment	Default
1850	Average bond price for states with the constitutional amendment	102.95	101.12	107.91	105.23	88.79
	Average bond price for states without the constitutional amendment	89.83	99.78	96.84	96.64	104.31
	Difference	14.12*** (2.98)	1.34 (0.28)	11.06** (2.39)	8.59* (1.93)	-15.51*** (3.38)
1855	Average bond price for states with the constitutional amendment	102.32	99.49	102.99	104.16	95.14
	Average bond price for states without the constitutional amendment	93.38	100.41	97.12	94.90	102.22
	Difference	8.94** (2.13)	-0.92 (0.20)	5.87 (1.57)	9.26** (2.72)	-7.07* (1.73)
1860	Average bond price for states with the constitutional amendment	97.73	98.04	98.67	93.45	97.64
	Average bond price for states without the constitutional amendment	90.81	92.69	93.73	99.48	93.62
	Difference	6.92* (1.97)	5.35 (1.50)	4.94 (1.20)	-6.03 (1.49)	4.02 (0.77)

Absolute value of t-statistics in parentheses. Statistical significance as follows: *** 1%; ** 5%; * 10%
Number of observations as follows: 1850 = 35; 1855 = 21; 1860 = 23

Column (1): No lending credit = a prohibition on the state from ever lending its credit on behalf of a private corporation or interest

Column (2): No purchasing stock = a prohibition on the state from ever purchasing the stock of a private corporation

Column (3): State debt limits—voting procedure = a procedural safeguard requiring either a supermajority of both houses of a state's legislatures and/or a majority vote of the general electorate

Column (4): State debt limits—time limits on repayments = a specified period of time within which any debt issued must have both interest and principal retired

obligations (again denoted with a 1 if the state defaulted and a 0 otherwise). Z'_i is a set of five control variables, to be discussed below, while ϕ_t is a time trend dummy variable for each of the years meant to capture any unobserved differences that may emerge between the years under consideration.

One potential issue involved with this analysis is the possibility that the bond price found within the dependent variable may be endogenous to the equation, and thus may actually be explaining some of the independent variables employed. The first best means to overcome this potential problem is through the use of an instrumental variable (IV) and two-stage least squares approach. Unfortunately, the lack of data availability would render a legitimate IV almost impossible to find. However, the historical record suggests that the possibility of any simultaneity bias to be remote for a number of reasons. First, the last state to default was Louisiana in early 1843, while the last state to fully resume payment was Maryland in the summer of 1848. Therefore, although at the time that a state defaulted, it may be the case that a change in bond price may have impacted the probability of defaulting, given that data for the first year employed in this analysis is from 1850, there would, in all likelihood, be no influence. This would also be the case for each of the variables employed for the constitutional amendments. Almost all of the states that passed constitutional amendments did so prior to 1850. For those that did not the only state that may pose some problem would be Pennsylvania (which did not pass any amendments until 1857). For the remaining states, only Kentucky, Virginia, Maryland, Indiana and Ohio had data available for 1850, when any simultaneity issues may be present. However, the historical records show that for four of those states (Kentucky, Maryland, Indiana, and Ohio) both the general vote for a constitutional convention as well as the convention itself happened prior to 1850.⁷ Therefore, given all of this evidence it would appear that the potential for any simultaneity bias is extremely low.

To further minimize the impact that any potential simultaneity bias may create, I have also included a set of five control variables, represented by the vector Z'_{it} , which I believe would directly impact the demand for a given state's bonds. First, I control for the number of years left until each bond matures.⁸ As suggested earlier, as the length of time increases before a bond matures, the inherent risk associated with that bond should increase. Therefore, I would expect this variable to have a negative impact on a state's bond price.

The second control I include is the coupon or interest rate attached to a bond. Obviously, a bond with an interest rate of 5% will, *ceteris paribus*, have a lower

⁷ Popular agitation in Maryland began in the early 1840's and was echoed by subsequent governors in their annual messages. Although a constitutional convention wasn't held until 1850, it was largely due to a long-standing debate over the procedural technicalities stipulated in the state's original constitution regarding the amendment process (Harry 1902). Citizens in Indiana voted in favor of a convention in 1848, which received strong support from Governor James Whitcomb in his annual message to the legislature of that year (*House Journal of 1848*). In Kentucky voters approved a proposed constitutional convention in 1847, which met in October of 1849 and convened in December of that year (Kentucky Legislative Research Commission 2003). Finally, Ohio voters also voted for a convention in October of 1849 (Smith 1851).

⁸ For 9 of the 79 observations there was no distinguishable maturity rate given. Therefore, I assume that each of these bonds matured after 10 years from the first date that data is obtained. For instance, if a state has an unknown maturity on a bond in 1855, I assume a maturity rate of 10 years in 1855 and 5 years in 1860. Although not reported, I considered several other maturity rates for unknown bonds, but found little material change in the results.

price than a bond paying 6%. Therefore, as the interest payment attached to a bond increases so too will its price.

The third control is whether or not a state had a free banking law. This variable is included to proxy for the demand that might be generated by a state's banking industry. As *Hunts Merchant's Magazine and Statistical Register* reported on March 1, 1848 in regard to New York's free banking law, "The influence of the free banking law, in producing a demand for New York stocks and a consequent rise in prices, has been considerable." Many times states required that before a bank could obtain a charter (whether it be through the legislative process or a free banking law), it had to have a certain amount of collateral on hand in the form of government bonds. Thus, I conjecture that a state with a free banking law would lead to an increase in the demand for bonds, resulting in higher bond prices.

The fourth control variable that I have incorporated is per capita debt. As the amount of debt issued by a state increased, many times it became much more difficult to find ready buyers. This further compounded the ability to readily raise enough revenue through taxation in the event that a state's finances fell upon difficult times. Therefore, I posit that as per capita debt increases it should lead to a decrease in the demand for a state's bonds, resulting in a lower bond price.

Finally, I also include a variable representing the number of years that each of the given states had been a full member of the Union. This variable is meant to proxy for gross state product, as no reliable GSP data exists for the period. I use this because, presumably, the longer the state had been a member of the Union, the more developed its economy would have been. Overall, I would expect this variable to have a positive impact on bond prices.

A second model specification that I also consider follows the form

$$\begin{aligned} \text{Bondprice}_{it} = & \alpha + \beta_{1t}\text{Amendment}_{it} + \beta_{2t}\text{Default}_{it} + \beta_{3t}\text{Amendment} * \text{Default}_{it} \\ & + Z'_{it}\delta + \varphi_t + \varepsilon_{it} \end{aligned} \quad (2)$$

where $\beta_{1t}\text{Amendment}_{it}$ represents each of the amendment variables, $\beta_{2t}\text{Default}_{it}$ again represents whether a state defaulted and $\beta_{3t}\text{Amendment} * \text{Default}_{it}$ is an interaction term between each of the amendment variables. As suggested earlier, I conjecture that for those states that previously defaulted, by constitutionally constraining themselves they correspondingly were able to reenter capital markets more rapidly than otherwise and thus these states benefited relatively more from these amendments than did non-defaulting states. Thus, by including an interaction term, it should pick up whether defaulting states did in fact benefit relatively more in comparison to non-defaulting or non-amending states.

Finally, I also incorporate a set of regressions based on the following equation

$$\text{Bondprice}_{it} = \alpha + \beta_{1t}\text{StringencyIndex}_{it} + \beta_{2t}\text{Default}_{it} + Z'_{it}\delta + \varphi_t + \varepsilon_{it} \quad (3)$$

where the variable $\text{StringencyIndex}_{it}$ is a variable representing how stringent each of the new constitutional measures that the states adopted was in total. In other words, with this variable each constitutional amendment adopted is given an equal weight of 1, then to create the index I sum each of those. For example, Kentucky passed three out of four of the constitutional amendments considered in this analysis;

therefore the state receives a three on the stringency index (out of a total possible score of four). This final variable may help to capture the importance and impact that the aggregate constitutional framework adopted may have had on a state.

4.2 Results and interpretation

The pooled OLS regression results also provide striking evidence of the impact that the several constitutional amendments had on bond prices across time. Table 3 shows the results assuming a bond's maturity for each state as the dependent variable.

Columns 1 through 5 show the results that each individual variable has when run separately against the dependent variable, while column 6 provides the results when all variables are run together. As seen, each of the constitutional amendment variables is positive and highly significant when run separately, suggesting that each amendment increased a state's average bond price by a low of \$5.12 for strict voting procedures and a high of \$9.80 for a prohibition on the lending of a state's credit to a private interest, while the default variable has a negative sign coefficient. Further, column 6 again provides the same expected sign predictions (except for the no lending of credit variable, which is negative but statistically insignificant), and also suggests that the two most influential constitutional amendments are restrictions on the purchase of private stock and strict procedural safeguards on issuing debt, increasing bond prices by \$13.91 and \$9.64 respectively.

This latter result seems especially relevant, as it acts almost as a two-tiered check on a state's ability to issue debt. In other words, the procedural requirements to change a constitutional amendment are much more costly and time-consuming, generally also requiring a greater than simple majority and majority vote by citizens. Therefore, state legislatures were *ex post* much more constrained not only in their ability to change the rule allowing them to issue more debt, but also in their ability to issue debt through the everyday political process afterward. Thus, this seems to be the most binding constraint that could be placed, short of an outright prohibition on any debt issue, and therefore potentially one of the most credible for markets. This is especially true given that most state legislatures were simultaneously required to pass appropriations bills meant to raise the necessary revenue to pay off the principal once the debt was incurred. Overall, the results are fairly clearly indicating that each constitutional restriction increased a state's average bond price once passed.

Next, I analyze the results from Eq. 2, found in Table 4.

Here again, the results do by-and-large suggest that defaulting states that subsequently constitutionally constrained themselves did benefit more than non-defaulting states. Except for a restriction on stock ownership, all of the other interaction terms are positive, with a low of \$3.00 for a restriction on the lending of credit to private interests and a high of \$17.08 for strict requirements on the repayment of debt. This again suggests that amendments regarding procedural restraints on the legislature and also on the ability to issue debt allowed previously defaulting states to more rapidly obtain favorable credit and bond prices. These results also help to support those in Table 3, and suggest that more rigorous and

Table 3 Pooled-OLS regression analysis using the average maturity date for each bond by state as the dependent variable

Independent variable	Pooled OLS—average maturity rates as the dependent variable					
Constant	33.78*** (3.03)	29.68** (2.51)	36.10*** (2.89)	38.77*** (3.16)	35.42*** (2.66)	34.93*** (3.19)
No lending credit	9.80*** (4.88)					-2.13 (0.47)
No purchasing stock		8.33*** (3.78)				13.91*** (3.39)
State debt limits—voting procedure			5.12** (2.18)			9.64** (2.40)
State debt limits—time limits on repayment				6.54*** (2.85)		1.41 (0.36)
Default					-0.29 (0.10)	-5.12** (2.04)
Number of years since achieving statehood	0.44*** (6.68)	0.55*** (7.46)	0.44*** (5.83)	0.36*** (4.46)	0.45*** (5.44)	0.49*** (6.08)
Free banking law	4.34** (2.19)	4.10* (1.94)	5.46** (2.48)	7.17*** (3.25)	5.72** (2.52)	3.33 (1.52)
Per capita debt	-0.49*** (3.40)	-0.66*** (4.00)	-0.31* (1.85)	-0.43*** (2.74)	-0.40* (1.97)	-0.41** (2.21)
Years to maturity	0.06 (0.60)	-0.01 (0.14)	0.03 (0.26)	-0.03 (0.23)	-0.05 (0.45)	0.13 (1.18)
Coupon rate	6.05*** (3.57)	6.88*** (1.78)	6.23*** (3.26)	6.54*** (3.53)	6.85*** (3.47)	5.28*** (3.19)
R-squared	0.538	0.453	0.416	0.467	0.378	0.585
Observations	79	79	79	79	79	79
Time fixed effects	Y	Y	Y	Y	Y	Y

Absolute value of t-statistics in parentheses. Statistical significance as follows: *** 1%; ** 5%; * 10%

Row (2): No lending credit = a prohibition on the state from ever lending its credit on behalf of a private corporation or interest

Row (3): No purchasing stock = a prohibition on the state from ever purchasing the stock of a private corporation

Row (4): State debt limits—voting procedure = a procedural safeguard requiring either a supermajority of both houses of a state's legislatures and/or a majority vote of the general electorate

Row (5): State debt limits—time limits on repayments = a specified period of time within which any debt issued must have both interest and principal retired

costly voting procedures not only limited the ability to issue debt, but also sent the necessary signal of credibility to potential creditors.

Next, for robustness I analyze the data from several other perspectives. The first takes as the dependent variable the average bond price based on the interest paid for each bond. For example, a state may have placed three separate bonds on the market, two paying 5% interest and one paying 6% issued in 1850, which due to the differing interest payments would have led to a different bond price. Thus, following my new procedure I would have two observations for that state, one for

Table 4 Pooled-OLS interaction regression analysis using the average maturity date for each bond by state as the dependent variable

Independent variables	Pooled OLS—average maturity rates as the dependent variable			
Constant	35.29*** (3.04)	33.49*** (2.75)	37.08*** (2.94)	41.93*** (3.59)
No lending credit	9.17*** (3.80)			
No lending credit interaction	3.00 (0.68)			
No purchasing stock		10.05*** (3.44)		
No purchasing stock interaction		-2.28 (0.49)		
State debt limits—voting procedure			2.35 (0.89)	
State debt limits—voting procedure interaction			13.27** (2.18)	
State debt limits—time limits on repayment				2.38 (1.00)
State debt limits—time limits on repayment interaction				17.08*** (3.77)
Default	-4.00 (1.04)	-2.23 (0.64)	-2.85 (1.00)	-4.38* (1.63)
Number of years since achieving statehood	0.43*** (5.75)	0.53*** (6.70)	0.53*** (5.70)	0.37*** (4.65)
Free banking law	4.52** (2.26)	3.80* (1.74)	5.07** (2.34)	8.70*** (4.19)
Per capita debt	-0.41** (2.33)	-0.55*** (2.92)	-0.29 (1.45)	-0.66*** (3.52)
Years to maturity	0.04 (0.40)	-0.01 (0.11)	0.02 (0.19)	-0.07 (0.66)
Coupon rate	5.99*** (3.44)	6.39*** (3.49)	5.32*** (2.75)	6.45*** (3.74)
R-squared	0.544	0.476	0.407	0.550
Observations	79	79	79	79
Time fixed effects	Y	Y	Y	Y

Absolute value of t-statistics in parentheses. Statistical significance as follows: *** 1%; ** 5%; * 10%

Row (2): No lending credit = a prohibition on the state from ever lending its credit on behalf of a private corporation or interest

Row (4): No purchasing stock = a prohibition on the state from ever purchasing the stock of a private corporation

Row (6): State debt limits—voting procedure = a procedural safeguard requiring either a supermajority of both houses of a state's legislatures and/or a majority vote of the general electorate

Row (8): State debt limits—time limits on repayments = a specified period of time within which any debt issued must have both interest and principal retired

the 6% issue and one for the average price of the 5% issue.⁹ The results are provided in Table 5.

As can be seen these results are extremely similar to those found initially in Table 3. For each individual variable, the constitutional amendments are all positive and significant, with a low of \$7.51 for the prohibition on the purchase of stock and a high of \$9.43 for the restriction on the lending of a state's credit to private interests. When run together, as in column 6, the results again are strikingly similar to those of Table 3, with both the restriction on the purchase of stock and strict voting procedures as having the greatest impact, increasing a state's bond price by \$12.34 and \$11.99 respectively.

I also provide the results from Eq. 2 for the interaction terms using this new independent variable as well, found in Table 6.

As with Table 4, the results presented here are almost identical. Further, it would again appear that both a strict voting procedure and a strict timeframe on the repayment of debt were the most significant restrictions on a previously defaulting state in a post-default world, both having the largest impact on a state's recovery after such a default as opposed to those states that did not impose similar restrictions.

As a final cut of the data I also take the overall average bond price for each state. Under this assumption I end up with one observation for each of the states in each of the given years.¹⁰ Although a relatively strong assumption, the results found in Table 7 are still suggestive of the importance that the constitutional constraints played.

As can be seen, when compared with both Tables 3 and 5, these results are extremely similar and support those previously found. Each of the individual constitutional amendments has a positive and significant sign coefficient, with a low of \$7.21 for a voting procedure and a high of \$9.71 for a restriction on the lending of credit to private interests. As before, when regressed together, the two most significant variables are a restriction on the purchase of private stock and a voting procedural safeguard, each increasing average bond prices by \$9.62 and \$10.93 respectively.

Again, I also run a set of regressions using this new dependent variable with the interaction terms listed in Eq. 2. These results are found in Table 8.

As before, these results conform to those found in Tables 4 and 6. Overall, all of the results taken together would suggest that these constitutional amendments almost across the board increased each state's bond prices after they were enacted. Each seems to have had a significant impact, greatly improving a state's overall debt and thus a state's fiscal position. What's more, defaulting states that enacted strict voting procedures as well as time limits on the repayment of interest and principal were able to recover more rapidly relative to those states that did not.

Finally, Table 9 provides the results from Eq. 3.

⁹ Obviously manipulating the dependent variable in this manner would require a similar manipulation of the variables for length to maturity and the coupon rate. Therefore, when multiple bond prices are averaged together I simultaneously average the years to maturity and coupon rate for those observations.

¹⁰ Again I average both the coupon and maturity rate variables in a fashion to reflect this change in the dependent variable.

Table 5 Pooled-OLS regression analysis using the average interest rates paid on each bond by state as the dependent variable

Independent variable	Pooled OLS—average interest rate as the dependent variable					
Constant	37.21** (2.51)	37.04** (2.34)	37.69** (2.39)	40.89** (2.60)	36.04** (2.03)	44.52*** (2.93)
No Lending credit	9.43*** (3.61)					-0.55 (0.10)
No purchasing stock		7.51** (2.42)				12.34** (2.42)
State debt limits—voting procedure			8.09** (2.54)			11.99** (2.29)
State debt limits—time limits on repayment				8.17** (2.66)		-0.61 (0.12)
Default					1.03 (0.29)	-5.16 (1.48)
Number of years since achieving statehood	0.40*** (5.03)	0.48*** (5.34)	0.41*** (4.78)	0.32*** (3.48)	0.43*** (4.20)	0.45*** (4.56)
Free banking law	5.03* (1.93)	4.41 (1.54)	5.89** (2.14)	8.14*** (2.87)	6.06** (2.04)	3.34 (1.12)
Per capita debt	-0.48** (2.47)	-0.55** (2.50)	-0.27 (1.34)	0.39* (1.96)	-0.39 (1.53)	-0.36 (1.62)
Years to maturity	0.11 (0.75)	0.03 (0.20)	0.15 (0.85)	-0.01 (0.10)	-0.02 (0.15)	0.30* -1.65
Coupon rate	5.36** (2.29)	5.69** (2.27)	5.31** (2.11)	5.95** (2.41)	6.43** (2.37)	3.19 (1.30)
R-squared	0.537	0.460	0.473	0.486	0.395	0.601
Observations	53	53	53	53	53	53
Time fixed effects	Y	Y	Y	Y	Y	Y

Absolute value of t-statistics in parentheses. Statistical significance as follows: *** 1%; ** 5%; * = 10%

Row (2): No lending credit = a prohibition on the state from ever lending its credit on behalf of a private corporation or interest

Row (3): No purchasing stock = a prohibition on the state from ever purchasing the stock of a private corporation

Row (4): State debt limits—voting procedure = a procedural safeguard requiring either a supermajority of both houses of a state's legislatures and/or a majority vote of the general electorate

Row (5): State debt limits—time limits on repayments = a specified period of time within which any debt issued must have both interest and principal retired

Columns 1 and 2 provide the results when the dependent variable is based on the maturity rate for the bonds of each state. Columns 3 and 4 assume the dependent variable is the average interest payment on each bond by state, while columns 5 and 6 assume the total average bond price for each state as the dependent variable. Overall, the results are all positive and significant. Specifically, based on the

Table 6 Pooled-OLS interaction regression analysis using the average interest rates paid on each bond by state as the dependent variable

Independent variables	Pooled OLS—average interest rate as the dependent variable			
Constant	38.31** (2.40)	42.99** (2.51)	37.84** (2.32)	44.13*** (2.80)
No lending credit	8.52** (2.68)			
No lending credit interaction	3.99 (0.73)			
No purchasing stock		11.23** (2.37)		
No purchasing stock interaction		-5.14 (0.82)		
State debt limits—voting procedure			4.31 (1.16)	
State debt limits—voting procedure interaction			12.74* (1.87)	
State debt limits—time limits on repayment				3.96 (1.19)
State debt limits—time limits on repayment interaction				15.20** (2.60)
Default	-4.08 (0.85)	-0.74 (0.17)	-1.90 (0.54)	-2.86 (0.82)
Number of years since achieving statehood	0.40*** (4.25)	0.46*** (4.68)	0.51*** (4.76)	0.34*** (3.56)
Free banking law	5.20* (1.96)	3.84 (1.29)	5.29* (1.93)	8.69*** (3.20)
Per capita debt	-0.41* (1.83)	-0.50** (2.04)	-0.30 (1.27)	-0.55** (2.44)
Years to maturity	0.08 (0.50)	0.07 (0.40)	0.10 (0.60)	-0.07 (0.45)
Coupon rate	5.35** (2.17)	4.77* (1.79)	4.66* (1.83)	5.75** (2.41)
R-squared	0.542	0.478	0.492	0.554
Observations	53	53	53	53
Time fixed effects	Y	Y	Y	Y

Absolute value of t-statistics in parentheses. Statistical significance as follows: *** 1%; ** 5%; * 10%

Row (2): No lending credit = a prohibition on the state from ever lending its credit on behalf of a private corporation or interest

Row (4): No purchasing stock = a prohibition on the state from ever purchasing the stock of a private corporation

Row (6): State debt limits—voting procedure = a procedural safeguard requiring either a supermajority of both houses of a state's legislatures and/or a majority vote of the general electorate

Row (8): State debt limits—time limits on repayments = a specified period of time within which any debt issued must have both interest and principal retired

Table 7 Pooled-OLS regression analysis using the average bond price for each state as the dependent variable

Independent variable	Pooled OLS—average bond prices as the dependent variable					
Constant	36.34*	32.45	42.42**	41.30*	31.46	56.11**
	(1.97)	(1.58)	(2.10)	(2.04)	(1.32)	(2.73)
No lending credit	9.79***					3.12
	(3.71)					(0.59)
No purchasing stock		7.21**				9.62*
		(2.15)				(1.93)
State debt limits—voting procedure			9.43**			10.93*
			(2.64)			(1.94)
State debt limits—time limits on repayment				8.49**		−2.06
				(2.56)		(0.39)
Default					0.95	−6.51
					(0.818)	(1.65)
Number of years since achieving statehood	0.41***	0.46***	0.41***	0.33***	0.42***	0.43***
	(5.12)	(4.98)	(4.78)	(3.56)	(3.84)	(4.25)
Free banking law	4.01	3.89	5.10*	7.68**	5.88*	1.91
	(1.51)	(1.27)	(1.79)	(2.64)	(1.86)	(0.60)
Per capita debt	−0.58***	−0.60**	−0.38*	−0.50**	−0.47*	−0.40*
	(3.02)	(2.68)	(1.84)	(2.42)	(1.76)	(1.80)
Years to maturity	−0.01	−0.07	0.18	−0.14	−0.08	0.18
	(0.07)	(0.37)	(0.81)	(0.70)	(0.35)	(0.76)
Coupon rate	6.26**	7.23**	4.71	6.57*	7.79**	2.09
	(2.09)	(2.18)	(1.39)	(2.02)	(2.12)	(0.61)
R-squared	0.617	0.523	0.551	0.537	0.452	0.683
Observations	41	41	41	41	41	41
Time fixed effects	Y	Y	Y	Y	Y	Y

Absolute value of t-statistics in parentheses. Statistical significance as follows: *** 1%; ** 5%; * 10%

Row (2): No lending credit = a prohibition on the state from ever lending its credit on behalf of a private corporation or interest

Row (3): No purchasing stock = a prohibition on the state from ever purchasing the stock of a private corporation

Row (4): State debt limits—voting procedure = a procedural safeguard requiring either a supermajority of both houses of a state's legislatures and/or a majority vote of the general electorate

Row (5): State debt limits—time limits on repayments = a specified period of time within which any debt issued must have both interest and principal retired

dependent variable used, with each additional constitutional constraint imposed by a state its bond price increases anywhere from a low of \$3.78 to a high of \$4.20. Thus, a state with all four constitutional constraints can expect a bond price that is roughly \$16 higher than a state that did not adopt any of the constraints. Further, the interaction term also suggests that as previously defaulted states adopted more constitutional constraints, their circumstances improve relatively more rapidly

Table 8 Pooled-OLS interaction regression analysis using the average bond price for each state as the dependent variable

Independent variables	Pooled OLS—average bond prices			
Constant	40.12*	43.27*	45.80**	46.44**
	(1.99)	(1.86)	(2.11)	(2.15)
No lending credit	8.48***			
	(2.73)			
No lending credit interaction	7.50			
	(1.41)			
No purchasing stock		11.04**		
		(2.06)		
No purchasing stock interaction		-3.82		
		(0.57)		
State debt limits—voting procedure			5.55	
			(1.35)	
State debt limits—voting procedure interaction			12.08*	
			(1.82)	
State debt limits—time limits on repayment				4.88
				(1.32)
State debt limits—time limits on repayment interaction				12.46*
				(2.00)
Default	-8.06	-2.65	-2.41	-3.82
	(1.63)	(0.52)	(0.62)	(0.92)
Number of years since achieving statehood	0.39***	0.43***	0.49***	0.23***
	(4.22)	(4.14)	(4.64)	(3.17)
Free banking law	4.20	3.42	4.48	8.11***
	(1.59)	(1.07)	(1.58)	(2.82)
Per capita debt	-0.46**	-0.52**	-0.38	-0.54**
	(2.10)	(2.05)	(1.60)	(2.29)
Years to maturity	-0.11	-0.10	0.14	-0.23
	(0.60)	(0.43)	(0.61)	(1.10)
Coupon rate	6.12*	5.76	3.63	6.23*
	(1.95)	(1.59)	(1.03)	(1.89)
R-squared	0.651	0.539	0.594	0.592
Observations	41	41	41	41
Time fixed effects	Y	Y	Y	Y

Absolute value of t-statistics in parentheses. Statistical significance as follows: *** 1%; ** 5%; * 10%

Row (2): No lending credit = a prohibition on the state from ever lending its credit on behalf of a private corporation or interest

Row (4): No purchasing stock = a prohibition on the state from ever purchasing the stock of a private corporation

Row (6): State debt limits—voting procedure = a procedural safeguard requiring either a supermajority of both houses of a state's legislatures and/or a majority vote of the general electorate

Row (8): State debt limits—time limits on repayments = a specified period of time within which any debt issued must have both interest and principal retired

Table 9 Pooled-OLS regression analysis using the constitutional stringency index

Independent variable	Average maturity		Average interest		Average price	
Constant	37.68*** (3.32)	36.58*** (3.28)	41.85*** (2.75)	41.25*** (2.76)	50.64** (2.54)	50.41** (2.64)
Stringency index	3.78*** (5.22)	2.84*** (3.29)	3.98*** (4.14)	3.00** (2.63)	4.20*** (4.16)	3.10*** (2.77)
Stringency index interaction		3.01* (1.94)		2.95 (1.56)		3.52* (1.94)
Default	-2.32 (0.96)	-7.10** (2.08)	-2.00 (0.64)	-6.54 (1.55)	-3.86 (1.10)	-9.67** (2.15)
Years since achieving statehood	0.39*** (5.44)	0.43*** (5.86)	0.37*** (4.19)	0.41*** (4.52)	0.36*** (3.98)	0.39*** (4.46)
Free bank	5.18*** (2.67)	5.79*** (3.01)	5.79** (2.29)	6.04** (2.42)	4.83* (1.87)	4.99* (2.02)
Per capita debt	-0.39** (2.29)	-0.44** (2.59)	-0.42* (1.95)	-0.43** (2.03)	-0.47** (2.20)	-0.47** (2.26)
Years to maturity	0.08 (0.75)	0.03 (0.30)	0.15 (0.98)	0.08 (0.50)	-0.01 (0.04)	-0.11 (0.60)
Coupon rate	5.66*** (3.34)	5.87*** (3.52)	4.65* (1.98)	4.79** (2.07)	4.13 (1.32)	4.32 (1.45)
R-squared	0.563	0.563	0.573	0.587	0.649	0.689
Observations	79	79	53	53	41	41
Time fixed effects	Y	Y	Y	Y	Y	Y

Row (2): No lending credit = a prohibition on the state from ever lending its credit on behalf of a private corporation or interest

Row (3): No purchasing stock = a prohibition on the state from ever purchasing the stock of a private corporation

Row (4): State debt limits—voting procedure = a procedural safeguard requiring either a supermajority of both houses of a state's legislatures and/or a majority vote of the general electorate

Row (5): State debt limits—time limits on repayments = a specified period of time within which any debt issued must have both interest and principal retired

as compared to non-defaulting states and states that did not impose similar constraints.

Given everything observed within the empirical analysis, it would suggest that constitutional constraints imposed by both defaulting and non-defaulting states may have in fact acted as credible commitments to bondholders going into the future. Given all of this evidence presented it would appear that bondholders took as most credible those constitutional constraints that limited stock ownership and imposed strict voting procedures on legislative bodies that were required to issue debt. Further, defaulting states, post-default, saw the most rapid increase in their bond prices as a result of imposing strict voting safeguards and also limiting the maturity period on outstanding debt. This latter amendment would presumably reduce the

inherent risk associated with longer-term debt, and thus provide a more reasonable timeframe for creditors to assess the potential risk associated with sovereign default.

Along with this, those states willing to adopt additional constraints were able both to see more rapidly improved bond prices and to obtain higher bond prices relative to states that were either unwilling or unable to more strictly constrain themselves. Overall, this seems to have made it possible for states to resume the financing of public projects at more reasonable rates, lessening both the debt burden and obligations on those respective states and citizens. Further, it would appear that those constitutional constraints acted as an “over-commitment,” meant to more strongly convey credibility into the future relative to those states that did not enact such constraints. Although states could have simply statutorily bound themselves, the response by creditors to those states that self imposed more rigorous constraints suggests this “over-commitment” did in fact have its desired effect.

Finally, these results may provide an interesting analysis for the unfolding events that have emerged today both internationally and domestically. As noted, the prediction market In-Trade has opened markets trading on the event that the states of New York, Illinois and California were to default. Interestingly, an analysis of each of these states shows they were some of the first to adopt not only several of the constitutional restrictions outlined above, but to also still have those amendments today. The question then becomes, how it is possible that even with these constitutional amendments intact today, these states have accrued as much debt as they have and have been deemed as risky as they are? An analysis of each of the current constitutional provisions suggests slow erosion of those original constitutional restrictions over time. Although a detailed analysis of each of these constitutions is beyond the scope of this current work, a simple word count is quite revealing.

For California the original amendments included in the state’s constitution consumed 324 words; however the section of the state’s current constitution dealing with public finance is now 1,644 words. For Illinois, the original constitution had 370 words devoted to public finance, but today that number stands at 568 words. Finally, the original amendments to New York’s constitution in regard to public finance and debt contained 1,841 words, whereas today it is 2,395. Most significant, the majority of the changes appear to specifically amend the limits on and ability to incur debt.

Further, Spain in order to cope with its own fiscal problems passed a balanced budget amendment to its constitution and some similar discussion has recently emerged in the United States. Although neither sovereign has yet to default, the debts that both have incurred have become a major policy issue. If the previous results provide any potential implications for today, it may be the possible importance of stricter voting procedures as a means to limit and constrain a sovereign from overextending credit. Some type of increased legislative majority and/or popular vote would increase the political cost associated with increasing a sovereign nation’s debt and thus potentially may slow the accumulation of debt and help to improve sovereign fiscal positions. Although many of these current issues are beyond the scope of this work, they may provide areas of future research.

5 Conclusion

The US state debt crisis of the early 1840s was an extremely acute episode. Though painful, it was relatively short-lived. After the smoke had settled, eight states and one territory had defaulted, several others came extremely close to defaulting, and five states either entirely or partially repudiated their debts. Shortly after this episode, many states passed constitutional amendments or adopted completely new constitutions, all of which had numerous clauses pertaining specifically to state credit.

This study has attempted to understand why this may have been the case. Specifically, I have argued that these amendments were a means by which states attempted to send a signal of future credibility to capital markets and thus to reenter those markets on more favorable terms. Given the results that I have obtained, there is strong evidence to suggest that these binding constraints did have a positive impact on creditors' perceptions of the individual state governments. States that constitutionally constrained themselves to specific rules regarding the issuing and financing of public debt saw significant increases in their average bond prices. However, it would also appear that although eventually all defaulting and repudiating states were able to reenter capital markets, for those without constitutional changes (even once repayment on portions of outstanding debt began), it was much more difficult and costly for them to either reenter credit markets or issue new debt.

Although this episode in American economic history has been studied at length from various aspects, few have considered this as a potential explanation for the state response that emerged. As such, this work has suggested an entirely new reason that states may have self-imposed the constitutional constraints that they did: as a means to convey a credible commitment to the future repayment of all debt obligations in a post-default world and simultaneously to constrain all future governments from overextending credit.

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