Legislative Capacity and Credit Risk*

David Fortunato† Ian R. Turner‡

Abstract

Legislatures differ in their institutional capacity to draft and enact policy. While strong legislatures can increase the congruence of policy outcomes to the electorate's preferences, they can also inject uncertainty into markets with their ability to alter the political economic landscape. We argue that this uncertainty will manifest in a state's ability to borrow and hypothesize a negative relationship between legislative capacity and credit-worthiness. Using ratings of general obligation bonds issued by the American states over nearly two decades and data on the institutional capacity of state legislative assemblies, we find support for the claim that having a legislature that is better equipped to affect policy change increases credit risk evaluations. The results we present broaden our understanding of the importance of legislative institutions, the determinants of credit risk, and the economic implications of democratic responsiveness.

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†Assistant Professor, Department of Political Science, Texas A&M University. Mailing address: 2010 Allen Building, 4348 TAMU, College Station, TX 77843-4348. Email: fortunato@tamu.edu.

‡Assistant Professor, Department of Political Science, Yale University. Mailing address: P.O. Box 208301, New Haven, CT 06520-8301. Email: ian.turner@yale.edu.

Legislatures vary widely in their ability to translate policy preferences into policy outcomes. Limited by informational resources, time in session, or legislators' incentives to invest in the policymaking process, some legislatures simply do not possess the institutional capacity to effectively bring policy in line with public sentiment. In such contexts, it is difficult to alter policy in response to changing needs or preferences and "democratic deficits" are more likely (Lax and Phillips 2012). Where legislative capacity is high, however, the translation of preferences into outcomes can be more efficient and legislatures are more likely to produce policies preferred by voters (Maestas 2000). Normatively, the increased democratic responsiveness induced through increased legislative capacity is an invaluable public good. However, the broader political economic implications of legislative capacity are, at present, not well understood.

There is no shortage of research on legislative capacity (or, professionalism). For example, previous studies have explored how capacity influences the composition of assemblies in terms of both diversity and partisanship (Squire 1992; Fiorina 1994, respectively), coattail effects and reelection rates (Berry, Berkman and Schneiderman 2000; Carey, Niemi and Powell 2000), patterns of internal organization and legislative scrutiny (Carroll and Cox 2012; Martin and Vanberg 2011), and legislatures' public approval (Kelleher and Wolak 2007). But only a very small portion of this research has examined the effects of capacity on policy outcomes. Moreover, these outcome-oriented studies have tended to focus on particular policy issues such as welfare generosity (Martin and Vanberg 2015), labor laws (Huber and Shipan 2002), or energy regulation (Ka and Teske 2002). When studies have taken a more general approach to policy, their primary concern has been the congruence of citizen preferences and legislative outcomes and there is agreement that congruence increases with capacity (Lax and Phillips 2012; Maestas 2000). Our contribution here is a broader exploration of the political economic implications of the capacity to rapidly and comprehensively change policy that reveals a real monetary cost to democratic responsiveness.

We argue that the responsiveness facilitated by a high capacity legislature, while providing many normative benefits, is not an unfettered public good. High capacity legislatures are more likely to alter the political economic landscape by, for example, altering rates of taxation or spending, re-

shaping regulatory environments, or otherwise channeling preferences into policy outcomes, and this capacity can, in turn, increase credit risk. That is, high capacity legislatures have the ability to rapidly and comprehensively alter policy in response to shifts in public sentiment, while low capacity legislatures lack the ability to deliver the same level of responsiveness. Thus, high capacity legislatures, in expectation, produce more variable policy environments while low capacity legislatures, in expectation, produce more stable environments. This policy uncertainty is of critical importance to state debt markets, where increased uncertainty decreases a lender's ability to forecast the likelihood a state will be willing and able to maintain its debt obligations. We therefore predict that higher levels of legislative capacity lead to higher risk evaluations on state general obligation bonds — a prediction that complements previous comparative research on the economic implications of policy uncertainty or political instability (e.g., Moore and Mukherjee 2006; Alesina et al. 1996).

To test our claim, we examine the relationship between legislative capacity and risk evaluations of U.S. state general obligation bonds. We posit that higher levels of state legislative professionalism capture the legislative capacity discussed above and are associated with higher credit risk assessments (i.e., lower credit ratings), making it more difficult for state governments to borrow and increasing the debt burden on taxpayers.[1] Though our arguments apply more broadly to any democratically governed state, the American states provide an ideal testing environment by holding constant many of the parameters that can confound cross-national analysis. Each of the fifty states (forty of which issue general obligation bonds) share a core institutional context: "presidential" systems with nearly identical electoral rules, party systems, and competency distributions. Further, all fifty states share a (relatively) common cultural context and have highly correlated economies. For all of these similarities, however, there is significant variation in the legislative capacity of America's state legislatures.

The results of the empirical analysis provide strong support for the central argument that state legislative capacity is significantly associated with lower credit ratings and makes several substantively interesting and normatively significant contributions. First, because we focus on the impact of

[1]Professionalism has become the industry standard proxy for legislative capacity; see Lax and Phillips (2012) and Boehmke and Shipan (2015) for recent examples.

outcomes, as opposed to, say, legislative efficiency in the form of bill initiation (e.g., Hedlund and Freeman 1981; Squire 1998), we provide evidence that legislative capacity increases the rate and depth of policy change in a manner unique to the literature.[2] Second, the findings suggest that the political economic implications of institutional choice are more far-reaching than previously suspected as the substantive effect of capacity on credit risk is even greater than explicit revenue limits, spending limits, and debt restrictions. Third, the empirical results make it clear that the public goods provided by high capacity legislatures come at a cost that is real and long-lasting. High capacity legislatures are instrumental to the quality of democratically desirable outcomes (i.e. Lax and Phillips 2012), however, we provide evidence that that capacity carries a significant monetary cost far in excess of the direct costs associated with increasing professionalism, such as providing competitive legislative salaries and high quality legislative staff.

These arguments and findings also have implications for comparative political economic research more generally. While our empirical tests focus on the American states, we believe the argument is widely applicable. Of course, there is a direct analogue to other federalist countries with subnational governments that issue debt, such as Germany, India, Mexico, and several others, but recall that the American states are chosen because they provide a nearly ideal testing ground for our arguments, not because our theory is necessarily constrained to the United States, or even federalist democracies. The same differences in legislative capacity that we discuss across the American states are manifest across all legislative bodies. For example, while U.S. House representatives are allocated over a dozen personal staff and each of their committees have several dozen dedicated staff members, the New Zealand Parliament has just 720 staff total to be shared across all 119 members in every capacity. Likewise, while Australian members of parliament earn over $200,000 annually, their counterparts in Spain earn approximately one-fifth as much. Further, while we believe such differences are salient, they likely pale in comparison to broader institutional differences determining a governments' capacity for policy responsiveness. Factors such as parliamentarism versus presidentialism, the ideological compatibility of governing coalitions, devolution of policy competencies to

[2] At the very least, we provide evidence that legislative capacity increases the rate and depth of policy change expected by lending markets.

subnational governments, and the number of veto players all conspire to engineer greater or lesser degrees of policy responsiveness and therefore policy stability. And while there is existing research in the extant literature on the relationship between political stability and economic outcomes, such as growth (Alesina et al. 1996) and foreign direct investment (Busse and Hefeker 2007), these studies tend to conceptualize stability as regime durability, propensity for mass violence, robustness of property rights, etc. Our study is novel in that we argue that markets react to changes in the political economic landscape brought on by democratic responsiveness. As such, our theoretical framework allows for a broader understanding of variability in economic outcomes within stable democracies, rather than across states at different points on the autocracy-democracy spectrum.

Legislative capacity, policy responsiveness, and credit risk

Our central focus is on a legislature's capacity to efficiently translate policy preferences into policy outcomes and we argue that this capacity is a function of professionalization (Squire 2007). The institutional context that characterizes professionalized legislatures leads to greater legislative capacity through several channels. First, there are institutions that aid in information gathering such as a larger and more able support staff (allocated to committees, caucuses, individual legislators, etc.) or committee systems with strong property rights that are procedurally autonomous. Second, there are institutions that motivate legislators to personally invest in information and expertise such as higher salaries, more generous benefits, the potential for upward mobility inside the legislature, or, relatedly, strong norms for committee assignments. Finally, there are institutions that support the policymaking process more generally, such as longer sessions which increase the amount of time the plenary (or a committee) has to propose, scrutinize, and pass policy while simultaneously limiting the amount of time legislators have to pursue outside occupations (Fortunato and Provins 2017). All of these institutional parameters improve legislators' abilities to pursue and produce policies they believe will benefit their constituents and/or electoral fortunes.[3]

While these parameters vary across all of the world's legislatures — and there has been ex-

[3]Importantly, all of these parameters tend to covary. For more information, see Squire and Hamm (2005), the canonical work on the institutionalization of state legislatures.

cellent cross-national research on the policymaking implications of such variation (e.g., Huber and Shipan 2002; Martin and Vanberg 2011) — the extant literature has primarily been concerned with the American states. The majority of this research has concentrated on issues such as the impact of professionalization on recruitment (Fiorina 1994), electoral results (Berry, Berkman and Schneiderman 2000), or membership composition more generally (Squire 1992). Our focus here, however, is policymaking, which Huber, Shipan and Pfahler (2001) argue is shaped by professionalization:

> "the expertise of legislators may also be a function of the legislative institutions themselves. If the legislature is highly institutionalized, with a large number of specialized committees and support staff, then it may be easier for the legislature to draft detailed legislation" (p. 334).

We build on, and contribute to, this research connecting legislative professionalism to policymaking capacity and argue that it ultimately affects the broader political economic landscape by considering the interplay of the electorate's preferences with these institutional structures.

Beginning with Erikson, Wright and McIver (1993), scholars have shown that state-level public opinion influences state-level policy choice — that state governments are *responsive* to constituent preferences. More recently, Maestas (2000, 2003) and Lax and Phillips (2012) provide compelling evidence that professional legislatures (i.e., high capacity legislatures) are more likely to change policy to increase congruence with public opinion. Professionalized legislatures have greater resources — e.g., time, staff, information — at their disposal to track public opinion, develop policy proposals that align with constituent preferences, initiate and scrutinize these proposals, and ultimately enact policy change in response to shifting preferences in the electorate. Unprofessional legislatures, by contrast, are simply ill-equipped to efficiently engage in these behaviors and therefore unable to rapidly pursue policy change to satisfy public sentiment. This is key to understanding how high levels of legislative capacity can inject uncertainty into the political economic environment. Even if we believe that the preferences of legislators or political parties are quite stable over time, voters are notoriously fickle and shocks to public opinion are common;[4] the impact of these

[4]See Page, Shapiro and Dempsey (1987) and Lax and Phillips (2009) for classic and contemporary examples.

changes will vary systematically according to the institutional context.

Imagine, for example, a shock to public opinion that uniformly shifts preferences on energy regulation in all states. This shock is much more likely to have deep policy effects in Michigan and New York than in Ohio and New Jersey — despite the socio-economic similarities between Michigan and Ohio or New York and New Jersey — because the institutional context of the Michigan and New York legislatures make those states much more able to alter the regulatory environment in response to shifting preferences.[5] Because public opinion shocks are unpredictable, high capacity legislatures make forecasting future policy environments more difficult as the efficient translation of policy preferences to policy outcomes necessitates the incorporation of such shocks into the forecast. Conversely, unprofessional "citizen legislatures," or those legislatures with low capacity, lead to a more stable political economic environment and increase the certainty of forecasts precisely because they are ill-equipped to respond to these shocks. Legislatures like the New Hampshire General Court, which meets for only 45 days over a two-year session, pays its members $100 per year, and has a representative to staff ratio greater than 3 to 1, simply lack the ability to efficiently respond to shifting preferences. In other words, unprofessional legislatures create an extraordinarily sticky status quo by denying their members the resources necessary to effectively legislate and this, in turn, makes for stable, predictable political economic environments.

This brings us to the connection between legislative capacity and evaluations of state credit risk. States generally borrow for one of two reasons: first, they may be forced to borrow because obligatory or preferred spending levels outpace available (or politically viable) revenues; second, they may wish to borrow to finance some type of investment (infrastructure, education, etc.) that demands more funds than the state has on hand. General obligation bonds are backed by the full faith and credit of the state and are nearly always repaid exclusively through tax revenue. As such, general obligation bonds issued by U.S. states provide a unique opportunity to study market responses to policy, or more precisely, policy change. As Lewis (2012) succinctly notes, "bond ratings provide information about risk and uncertainty that result from the interaction between economic and

[5]See Squire (2007) for detailed descriptive analysis of professionalism across states and over time.

political factors" (p. 309).[6] Because a state's ability to repay its debts is a direct function of its fiscal policy, its overall economic health, and its willingness to maintain its debts,[7] the policy environment created by a state's government should be a factor bond markets weigh heavily when they evaluate the risk of lending to that state.

Existing scholarship shows that a state's fiscal tastes and behaviors have a robust impact on credit risk (Lowry and Alt 2001; Andersen, Lassen and Nielsen 2014), but a state's preferences for taxation and spending are only one part of the policy equation. Risk evaluations also include the constitutional context that helps determine the future supply of debt and the probability of honoring current debt (e.g., balanced budget rules, deficit carry-over limits), economic factors that contribute to a state's ability to honor debt obligations, the state's current level of outstanding debt, and a state's propensity to incur or repay debt (Poterba and Rueben 1999, 2001). More salient for present purposes, governments also impact economic well-being through their investments and regulatory choices and this well-being, in turn, determines the pool of potential revenues. Thus, while overall levels of taxation and spending are perhaps the most important choice a government makes, this choice is still but one piece of the broader policy environment that determines a state's credit risk.

Legislative capacity is an antecedent to these risk factors. Without the capacity to substantively alter existing fiscal policy or update the state regulatory environment, risk assessments can be made with the expectation that the policy environment will remain stable. In contrast, high capacity legislatures allow elected officials to rapidly and comprehensively respond to shifts in public opinion (or preferences within the legislature) and therefore lead to much more uncertain future policy environments. In a sense, low capacity legislatures provide a credible commitment to maintain status quo policies into the future since they 'tie the hands' of both present and future representatives by inhibiting the ability of current members to learn and respond to changing preferences in the electorate in their pursuit of reelection while also inhibiting the ability of future members to pursue their potentially different policy goals upon entering office.

[6] See also Depken and Lafountain (2006); Krueger and Walker (2008); Lowry and Alt (2001).

[7] Krueger and Walker note that "[w]hile actual default may be an option only in the extreme, governments can and do change their taxing and spending priorities in ways that can threaten the long-term viability of repayment" (2008, p. 263–264) and states commonly restructure their debt obligations.

This implies that a low capacity legislature will generally impede policy change in the short and long term. Both of these functions are salient as general obligation bond maturities range from 1-30 years (though maturities of less than 5 years are rare and ranges of 10-20 years are most common), which means that lending markets must consider both present and expected future contexts; and both are consistent with the finding that increased capacity leads to increased responsiveness. Further, both of these mechanisms have analogues to previous research on the impact of institutional constraints on fiscal policy, monetary policy, and the ability to borrow. That is, just as building institutional walls between opportunistic governments and central banks increases the long-term credibility of monetary policy (Hallerberg 2002; Keefer and Stasavage 2003) and constitutional restrictions on spending enforce fiscal discipline (Poterba and Rueben 1999, 2001), low capacity legislatures reduce credit risk by curtailing legislators' ability to meddle with policy and therefore allow them to promise stable political economic environments. Paraphrasing from above, a low capacity legislature is an institutional commitment to the status quo.

Of course, not all policy areas and political environments are the same. Some policy areas are less contentious, or common value, across parties while others are contentious and partisan. Some political environments are highly competitive with frequent individual and partisan turnover while others are characterized by near monopoly control of the legislature. Our argument applies across these different areas and environments. Even without partisan conflict over policy or turnover in the legislature the possibility of shifts in public sentiment, or policy-environmental shocks, can create the desire to alter policy in response. In these circumstances, as illustrated in previous work such as Lax and Phillips (2012), high capacity legislatures – regardless of which party controls the legislature – are the ones with the means to respond while low capacity legislatures are constrained as described above. Similarly, in situations in which policy areas are contentious or there is frequent turnover in the legislature the party in power would like to alter policy to respond to the preferences of the voters who brought them to power. In this case, shifts in public preferences or policy-environmental evolution may still lead to policy change in legislatures with the capacity to do so, but policy change may also spring from a new party taking control of the legislature or

new membership composition with different policy goals – based both on their own preferences and those of voters. In all of these cases only high capacity legislatures have the resources to respond to these shifts in order to satisfy constituents or realize their own policy goals. Low capacity legislatures simply do not have the tools necessary to rapidly and comprehensively change policies to the extent a high capacity legislature does regardless of which party is in power. This again implies a relatively higher level of policy stability when the legislature is less professionalized.

Moreover, this argument follows even though high capacity legislatures may be better able to respond to changing environments to ensure stability in policy outcomes. That is, evolving policy environments, even without shifts in public sentiment, may require policy change simply to ensure that the outcomes of policies – e.g., number of citizens receiving subsidized health insurance or levels of government assistance – are stable. Even in these cases it is also likely that political economic factors that affect credit ratings such as tax policies, regulatory environments, and spending priorities will need to shift. From the perspective of lending markets these policy shifts are likely to introduce variability and forecasting uncertainty. Yet again, it is more likely that overall political economic stability will be maintained by a low capacity legislature due to their relative inability to rapidly respond to changing circumstances.[8]

In summary, we argue that high capacity legislatures create more variable political economic environments by facilitating legislators' ability to respond to preference shocks or, more generally, shifts in public sentiment. This variability creates market uncertainty which is manifest in lower ratings of state general obligation bonds. This yields the following prediction:

Capacity hypothesis. All else equal, as legislative capacity increases, evaluations of general

[8]Of course, we are not suggesting that our argument applies seamlessly in every instance of policymaking, in all political environments, and across all policy areas. It is likely that in some instances the potential policy stability offered by high capacity legislatures will prove advantageous to the states they serve. It may be that in some instances high capacity legislatures are able to fully balance competing concerns like those outlined above and avoid upsetting bond market evaluations. However, while that may happen in some areas, our central argument that increased capacity increases policy responsiveness, which injects uncertainty into political economic environments leading to lower credit ratings is likely to also apply across many policy areas and in many political environments. Insofar as the former case dominates policymaking in a state it should be much more difficult for us to find empirical support for the hypothesis below. In contrast, support for our hypothesis suggests that our argument accurately reflects how capacity affects credit ratings, at least in policy areas that are important from the point-of-view of lending markets. We thank an anonymous reviewer for suggesting we clarify these possibilities.

obligation bond risk increase.

Empirical assessment of legislative capacity and credit risk

We now test the *capacity hypothesis* by analyzing the relationship between legislative capacity and credit risk in the American states. We begin investigating the hypothesis with a simple examination of the raw data. Then, we analyze both a fully specified single-stage model and two-stage model, present the results, and note alternative specifications that can be found in the appendix.

Data and preliminary analysis

Testing the *capacity hypothesis* requires data on state general obligation bond risk as well as data on state legislative capacity. For risk evaluations, we utilize ratings assigned to each state's general obligation bonds by the three major rating houses (Fitch, Moody's, and S&P) as recorded by the U.S. Census Bureau's Statistical Abstract of the States from 1995–2010 for all forty states issuing general obligation bonds.[9] Following Krueger and Walker (2008, 2010), we consider risk a latent construct — a stimulus to which bond ratings are a response.[10] Where the true risk of lending to state i in year t is θ_{it}, we can consider each rating y_{itb}, from each rating house b, an ordinal estimate of θ_{it}, conditioned on aspects of the rating house and some error. In the regression framework this is given by,

$$y_{itb} = \alpha_b + \theta_{it}\beta_b + \varepsilon_{itb},$$

where y_{itb} is observed and each rating house intercept α_b, rating house slope β_b, and rating house-state-year error term ε_{itb}, as well as the underlying stimulus θ_{it} are unobserved. This equation can be estimated as a hierarchical ordered probit model to recover estimates of θ_{it}, however, the number of parameters to estimate, problems resulting from each house not issuing ratings for every state

[9] Colorado, Idaho, Indiana, Iowa, Kansas, Kentucky, Nebraska, North Dakota, South Dakota, and Wyoming did not issue general obligation bonds during our sample period. These states do receive ratings, however, and estimates from models including these states are very similar to the results we present here in the main text.

[10] One may question the use of bond ratings, rather than interest rates, as the dependent variable. Where bond ratings are a direct response to risk, interest rates are a function of risk and several other factors unrelated to risk, such as the supply of available debt, expectations for inflation, or relative risk in the stock market, to name only a few. As such, bond ratings supply a much more direct estimate of our theoretical concept.

in every year, and problems resulting from some potential rating values going unobserved over the entire sample,[11] make the probit model a cumbersome choice.[12] However, the underlying risk θ_{it} may be efficiently estimated via MCMC hierarchical ordered factor analysis (Quinn 2004).[13] This process, and similar variants, have been used to estimate an array of unobservable, yet substantively interesting political economic concepts including a state's level of democracy (Treier and Jackman 2008), individuals' motivation to be productive at work (Bertelli 2007), and, most salient for our purposes, state credit risk (Krueger and Walker 2008, 2010).

There are several benefits to this approach. First, the recovered values of θ_{it} are on a common scale that is comparable across states and years and theoretically bounded $\theta_{it} \in (-\infty, \infty)$, which dramatically eases the estimation of its predictors in the analysis to follow. Second, the rating houses do not rate each state in each year, as mentioned above. This may lead to an abundance of missing data in alternative approaches, such as analyzing each individual rating, or force the researcher to make assumptions about the nature of missingness, as would be the case in analyzing numerical means of the ratings. But the estimation procedure employed here does not use listwise deletion to account for missingness, nor does it ignore missingness. Instead, missingness merely impacts the certainty of our θ_{it} estimates. This leads to the third advantage: estimating θ_{it} yields a distribution of errors that may be modeled explicitly to better estimate uncertainty about the relationship between legislative capacity and credit risk. Finally, the most popular approach, taking a numerical mean of the ratings (Depken and Lafountain 2006), or even a coarsened rank ordering (Kelemen and Teo 2014), makes powerful linearity assumptions *within* scales and comparability assumptions *across* scales. Such an approach must assume that the difference between S&P AAA and AA+ ratings

[11] That is, while every rating house has about 10 distinct ratings they may issue, only about 8 ratings per house are actually issued over the period of analysis.

[12] To clarify what data would actually enter the right-hand side of the equation in an ordered probit model used to estimate θ_{it} note the following. Where missingness and sample size are not problems, the model would take the shape of a hierarchical ordered probit where the dependent variable is the ordered bond rating and the independent variables are vectors of state-year indicators and random slopes and intercepts are estimated for rating houses. Then, the state-year parameters could be used to construct estimates of θ_{it} free of rating house effects. This process would require more than three ratings per year to efficiently identify the state-year parameters. Thus, we employ the empirical strategy described below.

[13] The model described by Quinn (2004) is estimated using the MCMCpack software package (Martin, Quinn and Park 2011).

is the same as the difference between S&P A+ and A ratings *and* that these differences are both equivalent to the difference between a Moody's A3 and Baa1. This assumption is unlikely to hold, but does not have to be made with the approach we employ.[14]

To illustrate the variability of the credit ratings across states and over time, Figure 1 plots the annual risk estimates for all general obligation bond issuing states in hollow points. The dark line in each pane represents the mean risk estimate for that state over all years, while the gray band illustrates the range of the minimum and maximum risk estimate for that state. As the plot shows, there is significant variation within states over time, as one would expect, but much more variation *across* states. Indeed, roughly 80% of the observed variation is attributable to cross-sectional, rather than temporal, factors.[15] This implies that the factors explaining the majority of the variation are more likely to be variables that are relatively consistent within states over time, but vary across states. Variables of this sort include legislative capacity as well as constitutional constraints on fiscal policy and budgeting procedure.

[FIGURE 1 ABOUT HERE]

For our focal independent variable, *legislative capacity*, we utilize the 'industry standard' measure from the literature on legislative professionalization in the U.S. states: the Squire Index (Squire 1992, 2007). In both theoretical and quantitative construction, the Squire Index is meant to capture a legislator's motivation to invest in policy expertise, as well as the informational resources at her disposal and time to affect policy change. This measure, which is theoretically bounded $[0, 1]$ (and observationally bounded [0.03, 0.63]), assumes that the U.S. Congress is "the archetypal professional legislature" (Squire 2007, p. 212) and is meant to capture the degree to which a legislature resembles the Congress on three dimensions: legislator compensation, days in session, and staff per member. On this scale, 1 indicates that a state legislature has policymaking resources on par with Congress and 0 indicates an effective absence of resources. Thus, this measure captures the key

[14] All that said, Krueger and Walker (2008) provide compelling evidence that the measure we use is highly correlated with the numerical mean and that correlation is also present in our sample. More information can be found in the appendix.

[15] Following Fortunato, Stevenson and Vonnahme (2016) we can estimate the cross-sectional and temporal variation by maximizing a hierarchical model of bond risk including only random intercepts for states and years.

institutional components discussed in our theory above. Additionally, this measure has been used to capture legislative capacity in recent work on state politics, allowing us to add comparable results to existing research (e.g., Boehmke and Shipan 2015; Lax and Phillips 2012).

[FIGURE 2 ABOUT HERE]

With both the operationalized dependent and focal independent variable in hand, we can begin to assess the relationship between legislative capacity and debt risk. Figure 2 plots the estimated risk values for all states against that state's Squire Index value for each year in the sample, where greater values on the *y-axis* indicate riskier borrowers and greater values on the *x-axis* indicate higher capacity legislatures. The shaded points represent states that issue general obligation bonds and the hollow points represent states that do not issue general obligation bonds, but are nonetheless issued debt ratings.[16] As the plot of the raw values in Figure 2 clearly shows, there is a positive relationship between bond risk and legislative professionalization in each year save one and the relationship is quite strong in most years. Though this is by no means conclusive, it is certainly encouraging that our hypothesized relationship is so apparent in the raw data. The one year in which the hypothesized relationship is not clearly shown is 2000, when the booming economy led to large surpluses that smoothed credit risk across states (indeed, the mean budget surplus in 2000 was 4.35 times greater than the mean surplus in all other years). Below, we estimate fully specified statistical models that account for such economic factors as well as other potential confounders, thereby providing a clearer picture of the relationship of interest.

Model specification

In an effort to better identify the magnitude and certainty of the relationship between credit risk and legislative capacity, we gather data on an array of potential confounders, many noted in the discussion above. We include variables capturing a state's institutional prerogatives toward accumulating and repaying debt, its ability to generate the required revenues to maintain its debts, and its level of outstanding debt to complement the measure of legislative capacity. There is ample guidance in

[16] Omitting these states only makes for a more distinct positive relationship between capacity and risk

extant literature as to which variables are important to include and we build on two recent studies in particular: Krueger and Walker (2008) and Kelemen and Teo (2014).

The institutional variables include several binaries indicating the presence of constraints to fiscal policy. If a state has a legally imposed *revenue limit*, its ability to raise sufficient funds to maintain its debt may be impeded. State's with a *spending limit* may be less likely to incur debt, however, these states may also be less able to make long or short term investments in production (infrastructure or education, for example), which could retard debt maintenance or increase the probability of incurring future debt in order to meet spending obligations. Similarly, states with an explicit *debt restriction* may be less likely to borrow irresponsibly, but may also face difficulties in making investments when the state of the lending market makes doing so advantageous. The final institutional variable regarding fiscal policy is the Advisory Council on Intergovernmental Relations index of fiscal rule rigidity, ranging from 0–10, where 0 is indicative of the least regimented budgetary procedure and 10 is indicative of the most constrained procedure. This serves as a type of summary measure for a state's ability to credibly commit to a balanced budget moving forward. Following Poterba and Rueben (1999), this variable enters the model folded into a binary where 1 indicates a score of *less* than six — representing lax budgetary guidelines — and 0 indicates otherwise. This variable is referred to as *ACIR lax* in the table below.

Krueger and Walker (2008) and Kelemen and Teo (2014), and nearly every other political science investigation of bond ratings or yields, employ a nearly identical set of economic variables, each measured at the level of the state-year, to account for a state's ability to generate sufficient revenue to repay its debts. *Per capita income* provides a measure of state wealth, or, the potential revenues that states may collect to service their debts or otherwise harness to improve productivity in either the long or short term. The *unemployment rate* serves as a similar proxy. More importantly, it provides leverage on the size of the potential welfare state as well as the size of the voting coalition that may demand transfers, which could potentially come at the expense of debt maintenance. Further, while per capita income provides information on the depth of wealth that can be taxed, the unemployment rate provides information on the size of the taxable population, which is particularly

informative given variation in the progressiveness of tax codes across states.

The present rates of *per capita revenue*, *average tax rate*, and *total per capita spending* provide information on a state's present rate of taxation and spending, which, as we know, is the best predictor of the future balance of revenue to debt obligation. These variables also provide information on a state's willingness or propensity to collect the revenues required to service its debt as well as its propensity to direct those revenues towards servicing its debt. The final economic control variable is a state's level of outstanding *debt*. Income, unemployment rate, revenue, and spending are rescaled to be standard normal before entering the statistical model to aid estimation efficiency and the interpretation of the estimates, though the substantive results do not change if this rescaling is omitted.

We also include several political variables that may influence legislative productivity or otherwise contribute to policy uncertainty. The first is *divided government*, which may both decrease productivity (Tsebelis 2002), particularly in the short term, and increase uncertainty. As Krueger and Walker (2008) note, small shocks in public support may change a comparably unproductive divided government into a very productive unified government, and, more importantly, it is difficult to forecast the direction of future policy change when the government is divided. The model also accounts for patterns of government *turnover*, that is, a change from Democratic to Republican, or Republican to divided control, etc., by including information covering the last several decades of elections. For this, we gather the results of all state elections from 1970 to the present and compute the number of changes in the partisan alignment of government over the number of elections in a given state in that period for each year in the sample period (1995-2010).[17] This means that a 1 indicates that every election has resulted in a power transition, 0 indicates that there have been no power transitions, and 0.5 indicates that one out of every two elections has resulted in a power transition. This measure is then weighted such that the result of more recent elections count more heavily than more distant elections.[18]

[17]The data is drawn from Klarner et al. (2013).

[18]That is, the value of the variable for a given state in 2000 is equivalent to $\frac{to_{2000}+0.9*to_{1998}+0.9^2*to_{1996}+...0.9^n*to_{1970}}{n}$, where *to* indicates that the election resulted in a turnover and *n* is the number of observed elections. The choice of which weight to employ, if any, is arbitrary to a degree, therefore the model is estimated with several different weights

Finally, we include an indicator for the presence of legislative *term limits*. Previous research has hypothesized that term limits increase the risk of lending to states by limiting the accumulation of policy expertise by individual legislators and decreasing incentives for cooperation across caucuses, and therefore decreasing ability to set good fiscal policy (Lewis 2012). This could be viewed as at odds with the argument we have made here. However, an uncertainty based model (rather than an information deficiency model) of how term limits should impact credit risk would yield the same empirical implication. Term limits inherently increase the uncertainty of future policy outcomes by *mandating* change in the membership of the legislature. Markets are simply incapable of forecasting policy outcomes when the composition of the assembly itself is unknown. It is therefore possible that any credit market preference for dilettante legislators driven by their comparative inability to reshape policy, may be overcome by a preference for stable legislative memberships. We return to this notion after the main analysis.

Estimation and results

Our data are a balanced cross-sectional time series of the forty states that issue general obligation debt over 16 years and we analyze them in two ways. First, we estimate two-stage least squares models, where we regress credit risk on our time-varying covariates (economic variables, divided government, term limits, and turnover) for each state individually and predict a risk estimate for each state holding all covariates constant at their means (or at 0 values in the case of binaries). In the second stage we regress these predicted risk estimates on our time-stable covariates (constitutional restrictions on fiscal policy and the mean value of the Squire Index, which changes little over time within our sample). We perform this two-stage analysis because some readers may be concerned about the degree of covariation in our variables or that certain economic covariates may be endogenous to our institutional parameters,[19] and others may be concerned that, while the variation in our focal variable is cross-sectional, a great deal of the data's power results from having observations

and we present the estimates using the weight that generates the best predicted values (0.9). Though the choice of weight affects the estimate on the turnover parameter, it is largely irrelevant for the rest of the parameters.

[19]We provide a detailed mapping of the covariate correlations in the appendix.

in multiple years and we wish to demonstrate that our results are robust to these concerns. It is important to note while examining the results of this estimation that the reported first-stage estimates are aggregated individual state regression covariates. As such, robust estimates from some states are washed out by insignificant or counter-pressuring results from other states. These are included in the main text only for transparency and interested readers can find state-by-state results in the appendix.

Second, we estimate pooled feasible generalized least squares (FGLS) models that are, for our sample, robust to autocorrelation in the dependent variable and heteroskedasticity in the error structure (Greene 2003).[20] Because the dependent variable, risk, is an estimate, it is important to account for the error structure of that estimate. To this end, we estimate 1,000 models using a unique draw from the distribution of risk estimates derived from the factor analysis described above as the dependent variable in each estimation. For each iteration, we take 100 draws from the model posterior.[21] This process yields a matrix of 100,000 parameter estimates that are summarized in Table 1 below for both the 2SLS and FGLS estimators.

[TABLE 1 ABOUT HERE]

Both analyses yield robust support for our argument, but the pooled FGLS estimates yield more conservative estimates of the relationship between capacity and risk and we therefore focus our interpretation on the single-stage model. Before examining the hypothesized relationship, there are a few general observations to be made. First, looking over the FGLS results, the estimate of nearly every parameter is in the direction the extant literature would predict, even if their effects are statistically negligible. The sensibility of the results verify that the dependent variable is measuring lending risk and also suggest that the model is properly specified. If, for example, the model suggested that high unemployment rates and low per capita incomes significantly reduced lending risk, then one would have reason to be skeptical of the model results in general. This is not the case — the models suggest just the opposite. Lax fiscal policy guidelines, as identified by the ACIR, also substantially increase lending risk, and, in general, our results comport with recent research (e.g.,

[20] The substantive results are robust to model choice and alternative estimations can be found in the appendix.

[21] The posterior draws are taken in the usual way (King, Tomz and Wittenberg 2000).

Kelemen and Teo 2014).

Our focal variable, the *Squire Index* is in the predicted direction and is quite robust statistically. Indeed, over 99.5% of the posterior draws for legislative capacity are positive across both analyses. Perhaps more importantly, the effects are substantively quite large. Averaging over the sample, increasing legislative capacity from its mean by one standard deviation effectively doubles credit risk. This change is almost precisely the equivalent of changing a state's legislative capacity from that of Texas to that of New Jersey. This is very strong support for the capacity hypothesis in both statistical and substantive terms. Lending markets evaluate states with greater legislative capacity as riskier borrowers.

By calling upon previous research we can put this finding in more concrete terms. Using the data on state bond yields presented in Poterba and Rueben (2001), we can predict the change in real borrowing costs levied by the risk increase for the case of the middle 1990's. The data suggest that change in real borrowing costs created by a first difference increase in legislative capacity is an increase of over 4 basis points. Averaging over our sample, this amounts to an increase of approximately $0.80, per person, per year, in 1998 dollars, which, as Poterba and Rueben (2001) point out, is a self-perpetuating rise in cost as interest is partially a function of indebtedness. This is greater than the effect of a 5% increase to the deficit and nearly twice as large as a 1% increase in unemployment as predicted by Poterba and Rueben (2001). That is, there is a very real political economic downside in the form of riskier credit evaluations for having a high capacity legislature, the burden of which falls largely upon taxpayers.

Membership turnover, legislative capacity, and credit risk

While the direct effect of term limits in the model above fall shy of traditional levels of significance, the variable deserves another look. In short, term limits *mandate* routinized changes in the preferences of the legislature, subject to shocks in the preferences of the electorate, in perpetuity. This mandated change to the composition of the legislature should exacerbate the contribution of legislative capacity to credit risk by compounding policy uncertainty. To assess this possibility, we

reestimate our FGLS model with the inclusion of an interaction between term limits and the Squire Index. We report the parameter estimates in the appendix and simply plot the conditional effect of imposing term limits over the observed range of the Squire Index in Figure 3. The effects are as predicted. While imposing term limits has no effect on credit risk when capacity is low and legislators are institutionally constrained in their ability to alter the policy landscape, there is a positive effect that manifests as capacity grows. Indeed, when capacity reaches its peak, the mean increase to risk is about 0.6, roughly 10% of the observed range of the variable.

[FIGURE 3 ABOUT HERE]

These effects contribute further evidence for our theory that legislative capacity is a principal contributor to policy uncertainty and that this uncertainty is punished by lending markets with higher risk evaluations. More specifically, the finding that term limits do not increase credit risk at low values of the Squire Index supports the argument that a low capacity legislature is an institutional commitment to the status quo — even when change to the composition of state chambers is *mandated*, credit markets do not respond if the hands of the incoming legislators are tied by a low capacity legislature. As capacity grows, however, this mandated change is punished at ever increasing levels.

Discussion and conclusions

We argued that high capacity legislatures — legislatures that provide robust informational resources and incentivize legislators to invest in the policymaking process — increase responsiveness by providing legislators with the resources needed to not only pursue their own policy goals, but also to identify changes in the preferences of the electorate and legislate accordingly. This, in turn, makes predicting future political economic environments in states with high capacity legislatures more difficult and, as a result, markets become more reluctant to lend to these states. To test this argument we compared the capacity of legislatures in the U.S. states to market evaluations of their credit risk and found a robust, positive relationship: states with higher capacity legislatures are viewed as

riskier borrowers. Indeed, averaging over the sample, a first difference increase in legislative capacity nearly doubles the predicted risk estimate and we noted that this increase (in the 1998 debt market) translates into a roughly $0.80 per capita increase in annual debt maintenance payments for citizens — an increase that compounds over time.

There are several substantive conclusions to draw from this study, apart from the effects on risk and real borrowing costs. First, we provide evidence that legislative capacity increases the rate and depth of policy change. As mentioned earlier, previous research has found a positive relationship between capacity and the number of bill submissions (Hedlund and Freeman 1981; Squire 1998), yet it is difficult to determine the degree of policy change without examining outcomes as legislative proposals can and do vary substantially in both their scope and their probability of becoming law. Here, by examining market reactions to a legislature's ability to change policy, the study provides evidence that capacity not only increases the speed of bill initiation, but also increases the rate and depth of policy change.

The analysis also provides further evidence that the structure of political institutions has broad and wide-ranging political economic consequences. Previous literature has already documented how high capacity legislatures can increase congruence between public preferences and policy outcomes (Lax and Phillips 2012; Maestas 2000), just as it has documented the power of fiscal institutions, particularly those that increase transparency and constrain deficits, in affecting borrowing costs by reducing market uncertainty (Alt and Lassen 2006; Lowry and Alt 2001). This study has married these two streams of the literature and in so doing found that the normative benefits of a professionalized assembly come at a real public cost. This is novel on two levels.

First, the overwhelming majority of fiscal instruments employed to either credibly commit to sensible fiscal policy or alleviate market information deficiencies come at some cost. But these costs are typically characterized in terms of the probability of political survival — as a function of inhibited ability to engage in electoral budget cycling — or an increased probability of austerity in times of economic difficulty. But if we consider the possibility of decreasing legislative capacity in an effort to decrease lender uncertainty and secure better borrowing rates, that particular change

comes at a completely different type of cost, one that inhibits the governing coalition's ability to enact its policy program *even in times of great economic prosperity* — a cost that is not imposed by balanced budget rules or high transparency. From a normative standpoint, many would consider this particular cost unbearable.

The second novel implication of this finding is the realization that providing the policies that citizens prefer is more expensive than previously understood. Not only must states weigh the relative costs and benefits of a particular policy, but they must assume a significant cost for the privilege of making that choice. In a sense, lending markets punish governments for doing precisely what they are designed to do.

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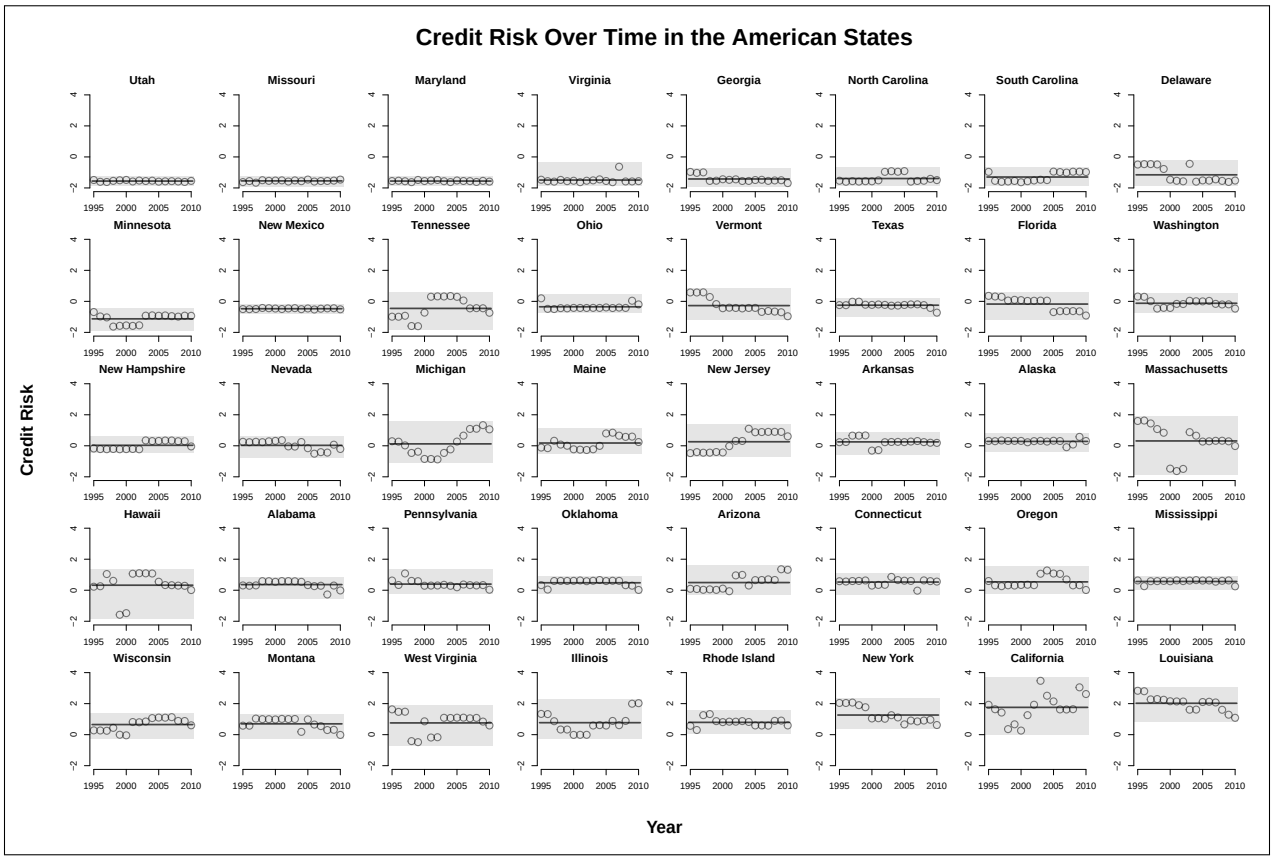
Credit Risk Over Time in the American States
Utah
Missouri
Maryland
Virginia
Georgia
North Carolina
South Carolina
Delaware
Minnesota
New Mexico
Tennessee
Ohio
Vermont
Texas
Florida
Washington
New Hampshire
Nevada
Michigan
Maine
New Jersey
Arkansas
Alaska
Massachusetts
Hawaii
Alabama
Pennsylvania
Oklahoma
Arizona
Connecticut
Oregon
Mississippi
Wisconsin
Montana
West Virginia
Illinois
Rhode Island
New York
California
Louisiana
Credit Risk
Year

Figure 1

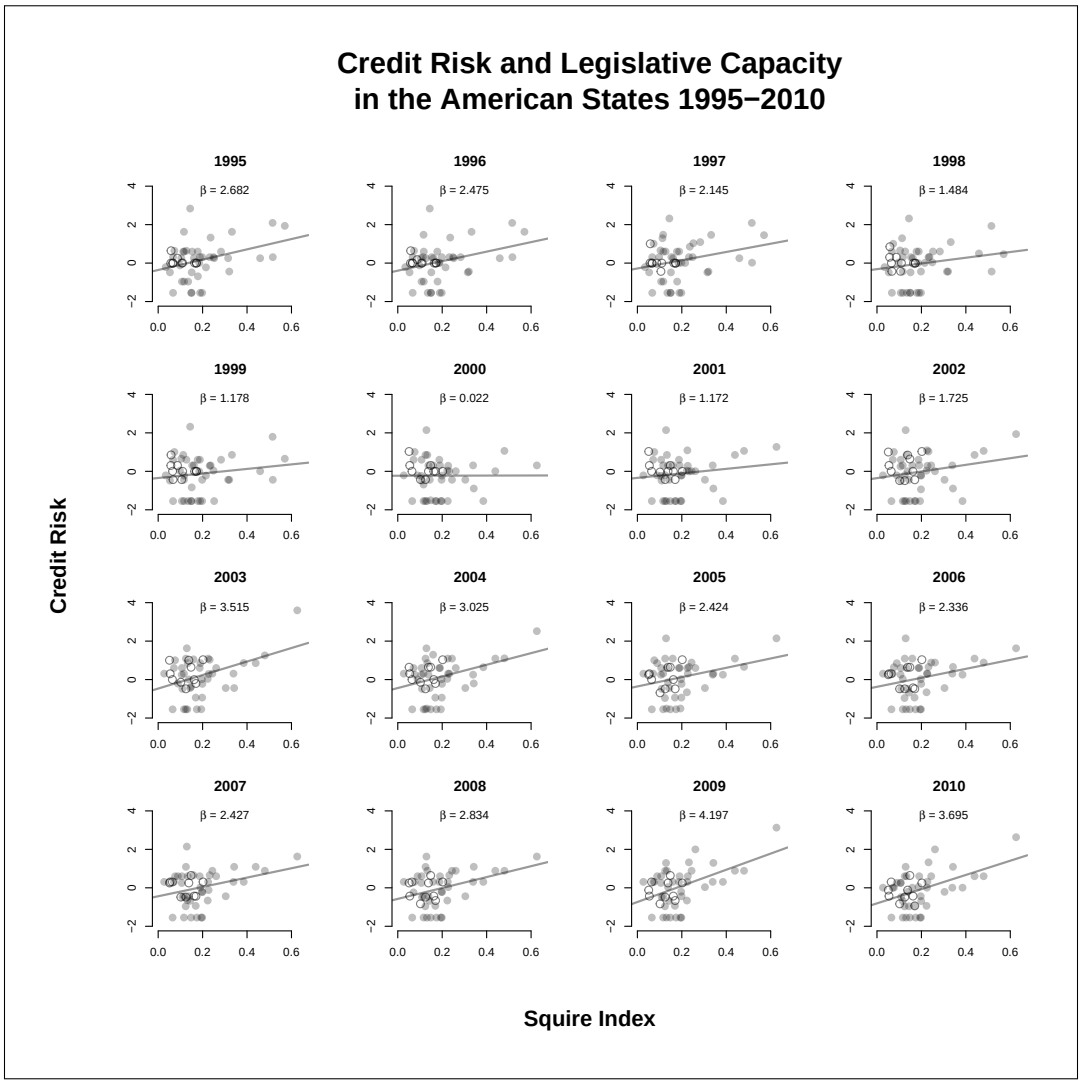
Credit Risk and Legislative Capacity
in the American States 1995−2010
1995
β = 2.682
1996
β = 2.475
1997
β = 2.145
1998
β = 1.484
1999
β = 1.178
2000
β = 0.022
2001
β = 1.172
2002
β = 1.725
2003
β = 3.515
2004
β = 3.025
2005
β = 2.424
2006
β = 2.336
2007
β = 2.427
2008
β = 2.834
2009
β = 4.197
2010
β = 3.695
Credit Risk
Squire Index

Figure 2

		2SLS			Pooled FGLS		
	Covariate	Mean	(sd)	p	Mean	(sd)	p
Time stable	Squire Index	3.617	(1.361)	0.004	2.154	(0.713)	0.001
	ACIR Lax	1.079	(0.636)	0.045	1.083	(0.351)	0.002
	Revenue Limit	-0.135	(0.509)	0.395	-0.195	(0.283)	0.245
	Spending Limit	0.167	(0.404)	0.340	0.138	(0.222)	0.268
	Debt Restriction	0.211	(0.540)	0.349	-0.243	(0.290)	0.201
	Intercept	-0.989	(0.570)	0.422			
Time varying	Term Limits	-0.262	(0.914)	0.433	0.077	(0.064)	0.116
	Divided Government	-0.014	(0.659)	0.465	0.050	(0.032)	0.059
	Historical Turnover	-0.024	(0.218)	0.456	0.737	(0.936)	0.215
	Unemployment Rate	0.004	(0.290)	0.531	0.070	(0.022)	0.001
	Per Capita Income	-0.112	(0.509)	0.426	-0.233	(0.052)	0.001
	Average Tax Burden	0.036	(0.329)	0.440	2.731	(3.609)	0.225
	Per Capita Spending	-0.041	(1.488)	0.472	0.190	(0.184)	0.151
	Per Capita Revenue	0.004	(0.639)	0.553	-0.044	(0.058)	0.223
	Per Capita Debt	0.052	(1.309)	0.425	-0.042	(0.102)	0.339
	Intercept	0.058	(1.229)	0.041	-0.886	(0.449)	0.025
	N ($1^{st}/2^{nd}$)	16 / 40			640		
	$\bar{R}^2$ ($1^{st}/2^{nd}$)	0.282 / 0.271			0.271		

$^*p$ estimates are directional probabilities

Table 1: Main Analysis: Estimates of Annual State Credit Risk.

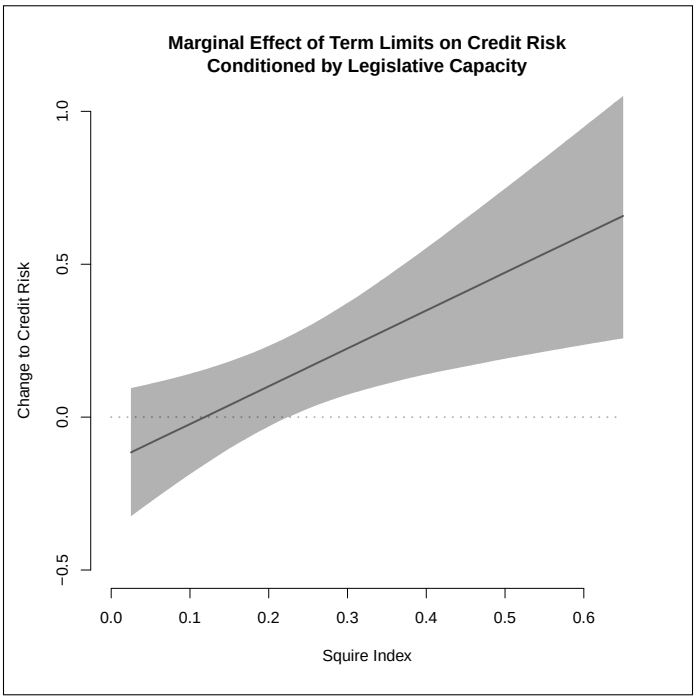
Marginal Effect of Term Limits on Credit Risk
Conditioned by Legislative Capacity
Change to Credit Risk
1.0
0.5
0.0
−0.5
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Squire Index

Figure 3