Separation of Powers and the Size of Government in the U.S. States

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Abstract

According to our model effective 'budgetary' separation of power occurs in the states with the line-item veto when the Governor is not aligned with the Legislature. Only then is the Legislature, which approves the budget and sets the tax level, not the full residual claimant of a tax increase. The tax level is determined by the overlap between the supporters of the Governor and the supporters of the legislative majority. The model generates a discontinuous and non-linear relationship between the tax level and the degree of alignment between Governor and Legislature. We find support in the data for this non-linear relationship and show that the discontinuity can be interpreted as a causal effect.

JEL: H00, H11, H20, H30, H71.

Key words: Separation of powers, divided government, line-item veto, tax level, semi-parametric, regression discontinuity design.

The goal of this paper is to propose a simple bargaining model through which the formal separation of powers between Governors and Legislatures affects the size of government in the U.S. states. To test our model we estimate a partially linear model between the degree of political alignment and the tax level.[1] Control variables and state and year dummies enter the model linearly, whereas the variable that captures the degree of support the Governor has in the Legislature is allowed to be non-linear. We use a regression discontinuity design to show that the positive jump in the tax level at the point where the government goes from divided to unified can be interpreted causally. The model we propose is able to give a rational for the non-linear relationship and discontinuity we estimate.

The way in which we model separation of powers builds on Persson et al. (2000). In the first model presented in Persson et al. (2000) the same representative controls both the tax level and the allocation of resources. In the second, one representative is assigned the power to raise taxes with another having the power to allocate resources. The tax level is lower in the latter model. What drives their result is that the representative with the power to decide the tax level is *not* the residual claimant of a tax increase. That is to say that the representative who decides on the tax level is unable to pocket the marginal increase in tax revenue for herself themselves or her constituency.

Similarly to Persson et al. (2000), we model the budget process between the two branches of government as a sequential bargaining game. We show that the line-item veto power[2] held by most Governors in the American states prevents the Legislature, the deciding body on both the tax level and the allocation of resources,[3] from being the

[1]For other applications of the partially linear model see Engle et al. (1986) and Schmalensee and Stoker (1999)

[2]The line-item veto and allows the Governor to veto particular items and words, or to trim values in the budget. In a minority of states the Governor has block veto power, a similar veto power to the U.S. President.

[3]In most states the budget proposal is written either by an independent agency or by the Governor's office. It is then sent to the Legislature where it can be amended at will conditional on a balanced budget. Once it is approved, the Governor may use their veto power. In most states the veto can be overridden with a two-third majority in both state chambers. For more detailed information on state budget procedures see the 'Budget Process in the States' at the National Association of State Budget Offices (NASBO) website (www.nasbo.org).

residual claimant of a tax increase. We call the institutional feature that stops the agent who sets the tax level from being the full residual claimant of a tax increase, *budgetary separation of powers*.[4]

What determines the tax level in our model is the size of the overlap between the districts that support the Governor and the districts that belong to the majority party in the Legislature. Only districts within this overlap receive positive transfers in equilibrium. As expected, our model predicts that an aligned government, i.e. where both the Governor and the Legislature are controlled by the same party, has a higher tax level than that of a divided government. Our model also shows that as the size of the majority in the Legislature increases above 50% of seats, the size of the overlap also increases, bringing a rise in the tax level. This occurs regardless of whether the majority is of the same party as the Governor or, counter-intuitively, of the opposing party.

As in Grossman and Helpman (2008), we model the degree of alignment between the two branches of government by focusing on the size of the overlap between two groups of voters: those that support the Executive and those that support the Legislature. In contrast to Grossman and Helpman (2008),[5] our model describes the budget as a sequential bargaining game: the Legislature makes an offer and, subsequently, the Governor may cut down or trim items. Unlike the executive in their model, the Governor in ours does not have the power to increase or propose transfers to districts. Whereas party identity is absent in Grossman and Helpman (2008)'s model, party identity plays a key role in ours. This is so even though we choose to assume that parties have no intrinsic preferences for certain tax levels.

Our assumption that the two main American parties have no intrinsic preferences

[4]The concept of budgetary separation of powers differs from the traditional way separation of powers has been defined: a separately elected executive that does not depend on a vote of confidence by the legislature (see for example Lijphart (1999) and Shugart and Carey (1992)).

[5]In Grossman and Helpman (2008) model, the legislative branch defines a spending limit and 'earmarks' certain projects in order to maximize the utility of the legislative branch's constituency. Random shocks to each project's productivity are realized after the proposal by the legislative branch has been made, but before the executive branch acts. Having observed the productivity shocks, the executive branch implements a budget to maximize the utility of its constituency, while still respecting both the limit and earmarked projects imposed by the legislative branch.

regarding the size of government comes from a few recent results. Ferreira and Gyourko (2009) and Gerber and Hopkins (2011) find no evidence that the partisan identity of the Mayor has an effect on government size. De Magalhães (2011) finds no evidence that the partisan identity of the majority in state Houses has an effect on government size. Besley and Case (2003), Reed (2006), and Leigh (2008) find no evidence that the party identity of the Governor affects the tax level.

We propose a model where parties have no clear preferences as to the size of government (they may have preferences over other ideological issues), and we present evidence that suggests that such nonpartisan model is able explains the relationship between the tax level and the degree of alignment between the Governor and the Legislature.

A key feature of our model is the line-item veto. The line-item veto has previously been modeled by papers such as Holtz-Eakin (1988) and Carter and Schap (1990). Both these papers use spatial models, in which the closer an implemented policy is to a politician's bliss points the higher is their payoff. In these instances, veto power allows the Governor to bring the implemented policy closer to their bliss point. Since bliss points can, in principle, be anywhere within the space, these models show no clear prediction of how the line-item veto could affect the size of government. Should a Governor have a preference for a large or small government, the presence of a strong veto power should help them to achieve this.

In our model, neither politicians nor voters have spatial bliss points relating to the size of government. As a result, the sequential bargaining game delivers clear and testable predictions on how the line-item veto affects the size of government. In the states with the line-item veto as we move from a unified to a divided government, the tax level should go down. For the states with the block veto our model predicts no discontinuity in the tax level and we we find none in the data.

A vast literature has looked at the effect of divided governments and institutional features in the American states. Some examples are Poterba (1994), Alt and Lowry (1994), Bohn and Inman (1996), and Alt and Lowry (2000). In particular, Abrams and Dougan

(1986), Holtz-Eakin (1988), Alm and Evers (1991), and Besley and Case (2003) have looked specifically at the line item veto. Our contribution is to focus on the non-linearities of this relationship and to implement a regression discontinuity design to try and determine whether the relationship is causal.

Our model also relates to the literature that has attempted to test the hypothesist that the separation of powers has a negative effect on government size. The result in Persson and Tabellini (2004) that a Presidential regimes induces a smaller government did not prove robust to the extension of the sample by Blume et al. (2009) and, to the best of our knowledge, has not been replicated elsewhere. By applying the insights from Persson et al. (2000) to the American states, we find support for the hypothesis that budgetary separation of powers has a negative effect on the tax level.

In section 1 we present our model in detail. In section 2 we set out to test whether the data rejects the non-linear relationship predicted by our model. In section 3 we conclude.

1 Model

1.1 Districts

A state is composed of N districts. Each district casts two votes, one to determine the legislative majority and one for Governor. In each election, a district chooses between Left and Right. We rule out the possibility that individuals within a district divide their vote for Governor between different candidates. Our intention is to capture in the simplest way possible the degree of alignment between representatives and the Governor. By keeping the district as the unity of analysis, we are able to model government redistribution with simple district-specific transfers. Another option would be to allow the government to also provide state-wide goods so that the Governor can cater for their across-districts constituency; this would further complicate to the model without altering its main insight.

We assume districts have lexicographic preferences regarding ideology and monetary transfers. If an ideological issue is a key component of a particular election (e.g. abortion rights, death penalty, right to bear arms, etc.), some districts may decide their vote on ideological grounds and ignore how an ideological vote may influence the amount of transfers they will receive. For other districts the ideological component of the election may not be as salient and, therefore, these districts will only take into account their monetary welfare. We assume the fraction of ideological districts for each party in each election is exogenous and less than 50%, so that there are no ideological majorities.

Since the focus of this paper is to explain how the bargaining game between the Governor and the Legislature affects the size of government, we will abstain from modeling the ideological vote in detail. Instead we will make two assumptions regarding the voting behavior of districts that vote for ideological reasons and one regarding the information available to politicians.

Assumption 1. We do not allow districts to vote for the Left for ideological reasons in one election and for the Right in the other election also for ideological reasons.

Assumption 2. If a district votes for the Left (Right) for ideological reason in the election with the least ideological votes for the Left (Right), then we assume that the same district also votes for the Left (Right) for ideological reasons in the election with the most ideological votes for the Left (Right).

The intuition for Assumption 2 is that if a district votes ideologically in an election in which ideology is not salient (few districts vote ideologically), then it must be that the same district also votes ideologically in the election where ideology is more salient (lots of district vote for ideological reasons). Other than the cases specified by Assumption 1 and 2 districts may vote as independents in one election and ideological in the other election.

Assumption 3. Neither the governor nor the legislative majority is able to observe whether a district voted ideologically or as an independent, politicians can only observed who the districts voted for.

Assumption 3 implies that politicians can not exclusively target transfers to the independent districts, and can only discriminate among districts according to whom they voted for.[6]

We now focus on the main driving force of the model, transfers. When determining its independent vote, a district will consider the following utility function:

$$U_i = y - \tau + V(f_i),$$

where y is an endowment equal to all districts;[7] τ is the tax level imposed by the government on every district; and $V(.)$ is a continuous, twice differentiable, increasing, and strictly concave function. With f_i, we intend to capture the characteristics of a targetable publicly provided good.[8]

We interpret f_i as the small part of the budget that is discretionary and may be targeted to districts at each period. In the data we observe that the tax level does not change by much within the period we study.[9] This is mostly due to the substantial amount of the revenues being pre-committed to particular expenditures. It would be straightforward to introduce a public good in the model whose benefit is shared by all districts and that corresponds to the bulk of state government expenditures. The levels of f_i in this case would be an addition to this state-wide expenditure, but the key component of the variation in spending over the years.

[6]Assumption 3 could be extended to the districts themselves: each district may only observe its own type and how the other districts vote. The model does not require a district to know the true type of the other districts.

[7]By assuming that all districts have the same endowment, we want to shut down the redistributional role that the tax level may have in unequal societies. The only differences between districts in our setup are their political choices. We normalize y to 1.

[8]One example of such a good is a local infrastructure project. Another could be transfers to school: one policy would be to invest more money in public schools; another would be to use the same money on school vouchers. Even though both goods are non-partisan in design, they may eventually redirect transfers to specific constituencies.

[9]See Table 1 in Section 2.1

1.2 Budget bargaining

The bargaining game takes place between two agents, the governor and the legislative majority. Since our focus is on explaining the size of government in the US states, we abstain from modeling ideological policy choices and focus exclusively on the policy decision regarding the amount of transfers each district receives.

The objective function of either agent is to maximize the utility of all the districts that support them. This is a simplifying assumption of the electoral process but it supported on some empirical evidence. Ansolabehere and Snyder (2006) show that in the American states the governing parties skew the distribution of funds in favor of areas that provide them with the strongest electoral support in two ways: counties that traditionally give the highest vote share to the governing party receive larger shares of state transfers to local governments and, moreover, when control of the state government changes, the distribution of funds shifts in the direction of the new governing party.

The budget is decided sequentially in two steps.[10] First, the legislative majority makes a proposal consisting of an f_i for each district. In the second step, the proposal can be vetoed by the Governor. The line-item veto allows the Governor to cut transfers to certain districts altogether, or to trim the amounts. The outside option of this bargaining game is $f = 0$, and we interpret this as a normalization where only the not-modeled-state-wide public good is provided.

The legislative majority chooses the amount of transfers for each district f_{i_L}, which also determines the total tax level τ, by solving the following maximization problem:

$$\begin{aligned} Max_{f_{i_L},\tau} \qquad & \sum_{0}^{i\in L} \Big(1-\tau+V(f_i)\Big), \\ s.t \qquad & N\tau \geq \sum f_{i_L}, \end{aligned}$$

[10]In most states the Governor or a budget agency produces the first draft. We skip this step as once the budget reaches the Legislature it can be amended at will. For more detail information for the budget procedures in the states see the National Association of State Budget Offices (NASBO) publication 'Budget Process in the States' at http://www.nasbo.org.

where by $i \in L$ we mean all the districts that are part of the legislative majority.

The Governor may only cut the transfers chosen by the legislative majority and therefore solves the following maximization problem:

$$
\begin{aligned}
Max_{f_{i_G},\tau} \qquad & \sum_{0}^{i \in G} \Big(1 - \tau + V(f_i)\Big), \\
s.t \qquad & f_{i_G} \leq f_{i_L} \;\; \forall\, i, \\
s.t \qquad & N\tau \geq \sum f_{i_G},
\end{aligned}
$$

where by $i \in G$ we mean all the districts in the Governor's support, which we define as all the districts that have voted for the Governor in the gubernatorial election.

Proposition 1.1 *Only districts that are both part of the legislative majority and part of the Governor's support receive positive transfers $f_i > 0$ in equilibrium.*

Proof There is an unique subgame perfect equilibrium in which at the last node, the Governor vetoes to zero any transfers f_{i_L} to districts not in her support. For the Governor's maximization problem any positive transfers to a district not in her support is a cost in the form of a higher tax level. At the first node, the legislative majority only assigns positive transfers $f_{i_L} > 0$ to districts in the legislative majority for the same reason.

1.3 Elections

For each election (legislative and gubernatorial) we assume a one-shot game where, according to their objective function, each party commits to maximizing the utility of all districts that vote for that party.

In each election a fraction of districts will vote ideologically for the Right and a fraction of districts will vote ideologically for the Left. Since we have ruled out ideological majorities, we must focus on the independents to determine the election results.

Proposition 1.2 *There are four pure-strategy Nash-equilibria: i) all independents vote for the Left in both the gubernatorial and legislative elections, ii) all independents vote* *for the Right in both the gubernatorial and legislative elections, iii) independents vote for the Left in the legislative election and for the Right in the gubernatorial election, and iv) independents vote for the Right in the legislative election and for the Left in the gubernatorial election.*

Proof in the Appendix.

The intuition for this result is that independents face a coordination problem. All that matters for a district voting independently is to be part of the majority. The identity of the majority does not matter. By being part of the majority the district can secure a higher monetary utility. Note that it does not matter whether the elections are simultaneous or sequential, the coordination problem between independents occurs even if they observe the result of the other election.

Corollary 1.3 *In equilibrium we only observe one combination of vote splitting: either [L,R] or [R,L], not both.*

Proof in the Appendix.

Corollary 1 is not an unusual result. Alesina and Rosenthal (1995) find a similar result in a model where individuals vote for purely ideological reasons. In their model, both party and voter have an ideological bliss point. In order to implement an ideological position in between the parties' preferred positions, voters may chose a divided government. They show that only one type of vote-splitting is observed in equilibrium.

1.4 Graphically representing the overlap between Governor and Legislature

Corollary 1 allows us to represent the predictions of our model neatly on a line. The remaining results of the paper are presented graphically and not in the form of propositions.

Let's call n_g the set of districts that have voted for the Governor from the Left. We stack the districts in the set n_g from left to right in a [0, 100] line, so that $|n_g|$ also denotes a scalar: a point in the [0, 100] line. If the Governor from the Left won the election, the set n_g denotes the Governor's support. If the Governor from the Right won the election, the set $100 - n_g$ denotes their support.

Without loss of generality, let's assume that the Governor from the Left has won. To give a concrete example, let's assume that $|n_g| = 57$. The districts in the interval $(57, 100]$ have voted for the Right. In Figure 1, the first horizontal arrow shows the districts in the Governor's support. The Governor's arrow goes up to the 57% point. We then draw a vertical line that crosses the three solid horizontal lines at the 57% point. The vertical line indicates the Governor's support in three different cases.

We call n_l the set of districts that have voted for the Left in the legislative election. We also stack these districts from left to right. If $|n_l| \geq 50$, the Left has the majority in the Legislature and the size of the majority is $|n_l|$. If $|n_l| < 50$, the Right has the majority in the Legislature. The size of the majority in this case is $|100 - n_l|$. We will abuse notation from now on and adopt n_l and n_g to denote the set, its size, and a scalar: the point in the [0,100] line.

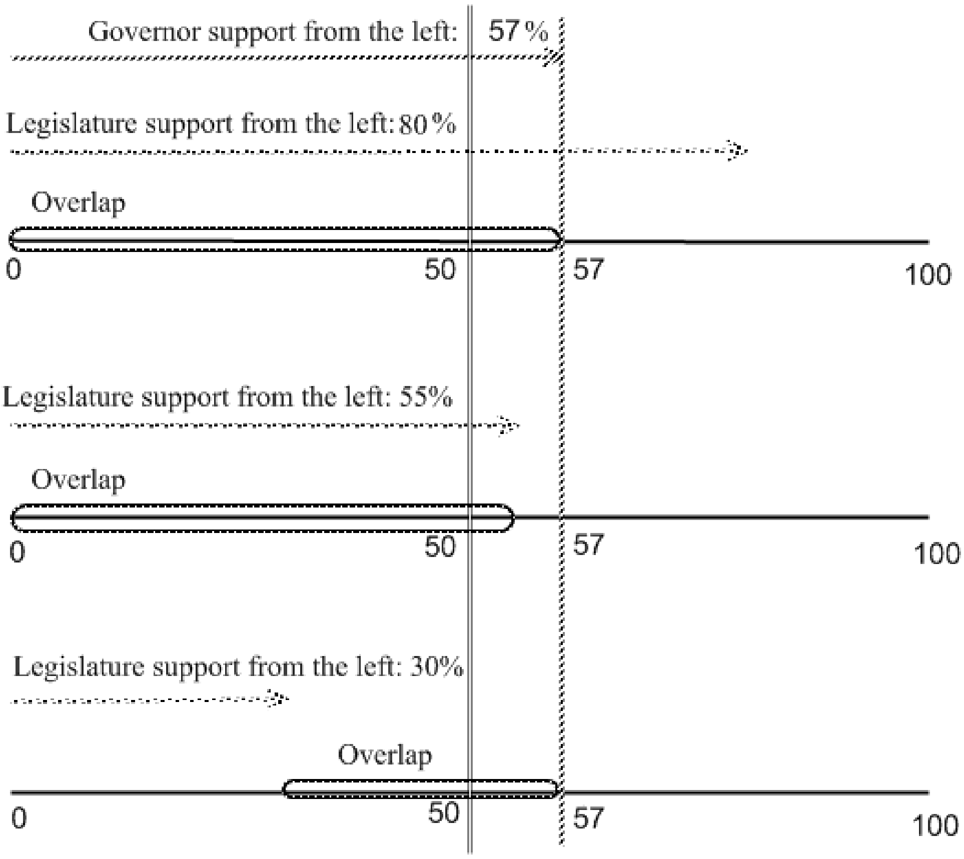
In the first case, where $n_g > 50$ and $n_l > n_g$, the overlap is given by n_g. As an example, in Figure 1 we have chosen $n_l = 80$; that is, 80% of the districts have voted for the Left in the legislative election. The districts that have been stacked from the left to the right up to $n_g = 57$ have voted for both the winning Governor and the winning party at the legislative election. They are the districts in the overlap between the Governor's support and the legislative majority.

In the second case, where $n_g > 50$, $n_l > 50$, and $n_g > n_l$, the overlap is given by n_l. As an example, we have chosen $n_l = 55$. The number of districts that voted for the Right in the legislative elections is higher than in the previous case – all those in the interval $(55, 100)$. Because the majority in the Legislature is smaller than the Governor's support, the size of the overlap is given by the size of the legislative majority. The size of the overlap is 55% of the districts.

In the third case, where $n_g > 50$ and $n_l < 50$, the overlap is given by $n_g - n_l$. The

Left has lost the legislative election. The size of the support for the Left is $n_l = 30$. The size of the legislative majority is given by stacking the districts from the right; that is, by $100 - 30 = 70$. The size of the overlap between the Governor (from the Left with $n_g = 57$) and the legislative majority from the Right is given by $57 - 30 = 27$.

Figure 1: Overlap between the Governor's support and the majority in the Legislature (n_g=57; n_l=80, n_l=55, n_l=30)



1.5 The overlap and the amount of transfers

From proposition 1.1 we know that only the districts that belong to the overlap (that is, to both the Governor's support and to the legislative majority) receive positive transfers in equilibrium, whether the government is aligned or divided. Changes in the size of the overlap determine the tax level. This is the main intuition of our separation-of-powers model.

In Figure 2, we have chosen an example with $n_g = 57$. The Governor is from the Left[11] and has the support of 57% of the districts. In the x-axis we have n_l; that is, the number of districts that have voted for the Left in the legislative election. If the number of seats from the Left in the Legislature is higher than 50% ($n_l > 50$), we have an aligned government; if the number of seats from the Left in the Legislature is less than 50% ($n_l < 50$), we have a divided Government.

In the y-axis in Figure 2, we have the number of districts that receive positive transfers, f_i, in equilibrium; that is, the size of the overlap between the legislative majority and the Governor's support (which is fixed at 57%).

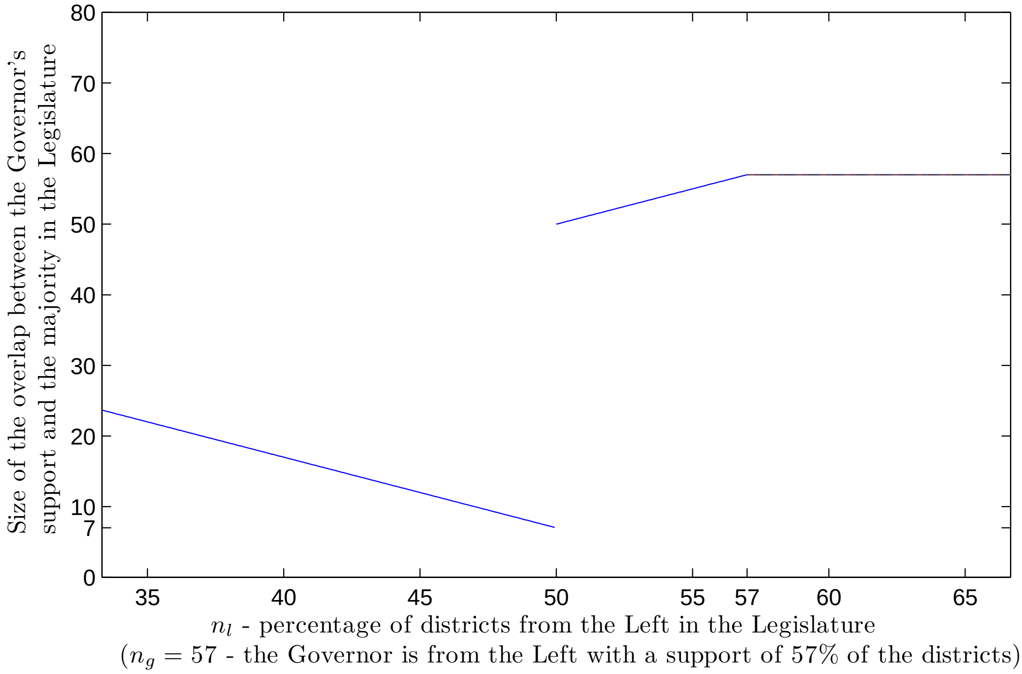
Our objective is to model how the two branches of government bargain to decide on the tax level. In the majority of states the Governor's veto may be overridden with two-thirds of the vote in the Legislature. We therefore focus on the interval in which the veto power is active: $((33.\overline{3}, 66.\overline{6})$.[12]

Let's first look at the interval $(33.\overline{3}, 50)$. Here the overlap is given by $n_g - n_l$, as the Right has the majority of seats in the Legislature. As we move away from the 50% point to the left towards the $33.\overline{3}$ point, the Right increases its share of seats in the Legislature (n_l decreases). As the number of seats controlled by the majority from the Right increases ($100-n_l$ increases), the size of the overlap between the Governor's support and the legislative majority increases.

[11] This is without loss of generality. We could have determined the Governor to be from the Right and restacked the districts from right to left instead.

[12] We have an extension of the model that takes into account how the tax level is determined outside this interval. This version is available on the on-line appendix, appendix B.

Figure 2: Degree of alignment between the Governor and the Legislature



We now look at the interval $(50, 57)$. Here, the overlap is given by n_l. As we move from the 50% point to the right, the percentage of seats that the Left has in the Legislature (n_l) increases. The size of the overlap between the legislative majority and the Governor's support increases as n_l approaches 57 but levels out thereafter.

In the interval $(57, 66.\overline{6})$, the overlap is given by n_g, which we have fixed at 57 in this example. The size of the overlap is constant, even though n_l increases. In Figure 2, we can see this with the horizontal line in the interval $(57, 66.\overline{6})$.

There is a discontinuous jump in the number of districts receiving positive levels of f_i when n_l moves across the 50% point. Immediately to the left of the 50% point, the size of the overlap between the Governor and a legislative majority from the Right with 50% of the seats is given by $n_g - n_l$; that is, $57 - 50 = 7\%$. In contrast, immediately to the right of the 50% point, the size of the overlap between the Governor and a legislative majority from the Left with 50% of the seats is given by n_l; that is, 50%.

Figure 2 depicts most of the intuition of our model. For a Governor with a given support, an increase in the size of the majority in the Legislature implies an increase in the overlap between the Governor's support and the majority. This is the case whether the legislative majority is from the same party as the Governor or from the opposition.

So far, our model generates a discontinuity at the 50% cutoff and a positive relationship between the tax level and the size of the majority around the 50% cutoff. In the next section, we explain why taxes may go down as the size of the majority increases beyond a certain point.

1.6 Transfers and the tax level

The first case is the one in which $n_l > 50$, $n_g > 50$, and $n_g < n_l$. This corresponds to the interval $n_l \in (57, 66.\overline{6})$ in Figure 2. The legislative majority acts first. In choosing the amount of transfers, they must internalize the cost of taxation for those districts in n_l that are not in n_g. These receive zero transfers because the Governor will veto any to districts not in n_g. The internalization of the cost of taxation makes it so that the majority chooses a tax level that is lower than the level that would be chosen by the Governor, who only cares about the district in n_g. Therefore, at the veto stage the Governor does not improve the utility of the districts in his support by trimming transfers to the districts in n_g (but he would cut to zero any positive transfers to those outside n_g). In practice, the Governor decides which districts receive positive transfers and the majority decides on the level of transfers.

The majority maximizes the utility of all its members with equal weight,

$$Max_f \sum_{0}^{n_l} \Big(1 - \tau + V(f_i)\Big),$$

facing the constraint that only those in n_g receive positive transfers,

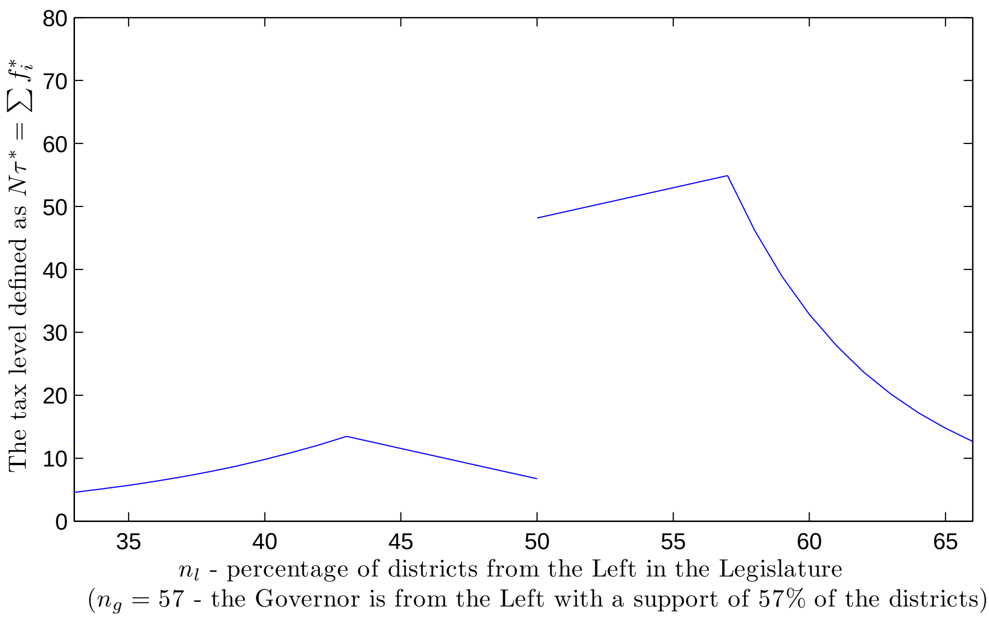
$$\begin{aligned} s.t \;\; N\tau &\geq n_g f_i \\ f_i &\geq 0 \; if \; i \in n_g \\ f_i &= 0 \; if \; i \notin n_g. \end{aligned}$$

The equilibrium tax level is given by

$$\tau^* = \frac{n_g}{N} V_f^{-1}(\frac{n_l}{N}).$$

Note here that for a fixed n_g, as n_l increases the tax level goes down. This is true as long as V(.) is strictly concave. As the majority in the Legislature exceeds the overlap with the Governor, the extra districts do not get any transfer; all they do is force the majority to internalize the cost of taxation even more.

Figure 3: The tax level predicted by the model with $V(f) = f^{9/10}$



The intuition for the other three cases are similar to case 1 and we present their derivation in the appendix. We collect these results in Figure 3, where we can see the relationship between the tax level and the percentage of districts in the Legislature that are from the same party as the Governor, n_l. We have kept the Governor fixed at $n_g = 57$ and have varied n_l. The functional form we have chosen is $V(f) = f^{\frac{9}{10}}$. The point of inflection depends on the size of the Governor's support (n_g). This implies that our model can potentially rationalize different shapes. If $n_g = 50$, the function is decreasing as we move away from the 50% cutoff on either side. If n_g is greater than 66.6, the function is increasing everywhere as we move away from the 50% cutoff. The discontinuity at 50% is present unless $n_g = 100$.

The main intuition from this section is that taxes may go down as the size of the majority in the Legislature outgrows the size of the Governor's support. This is so because a larger majority internalizes the cost of taxation more and therefore keeps the level of transfers down in the first place, leaving nothing for the Governor to veto.

1.7 States with the block veto

The predictions of our model hinge on the line-item veto power. To claim support in the data for these prediction we must pass two important tests: i) the data for the states with the line-item veto should not falsify the relationship described in Figure 3; ii) the relationship should be different in the data for the states with the block veto. In this section we describe briefly what our model predicts in the states with the block veto. The key difference is that our model predicts no discontinuity in the tax level for the states with the block veto; this is confirmed in the data.

The first thing to note is that the block veto is considerably more costly than the line-item veto. The budget in the states with the block veto resembles more closely a take-it-or-leave-it offer with a costly outside option for the Governor: not only $f = 0$, but also a potential government shut-down. During a shutdown, government employees stay at home and all government-provided services stop, except for those within essential areas.[13] A block veto of the budget creates a stalemate in the budget process. In practice, each state government deals differently with such a stalemate. Two of the states with the block veto (North Carolina and New Hampshire) allow for continuing temporary resolutions. Three others (Nevada, Virginia, and Washington) have no specific procedures to deal with this eventuality, which means that a government shut-down is possible. In the remaining states (Indiana, Iowa, Maine, and Vermont), a government shut-down is

[13]See NCSL document 'Procedures When the Appropriations Act is Not Passed by the Beginning of the Fiscal Year': http://ncsl.org/default.aspx?tabid=12616. For a detailed description of federal government shutdowns see Meyers (1997).

determined by state law in the case of a stalemate in the budget process. For simplicity, we assume the block veto to be prohibitively costly.

By making the assumption that the block veto is prohibitively costly and because we model the budget as a sequential bargaining game, the Governor plays no role in the budget decision in the model for the block veto states.[14] The majority will make a proposal that leaves the Governor indifferent between shutting down the government and accepting the majority's budget. In particular, the Governor will not be able to cut down the pork barrel. The decision on the level of transfers is left to the Legislature alone. The legislative majority is able to set the tax level and allocate resources. There is no budgetary separation of powers in the states with the block veto, the legislative majority is the residual claimant of a tax increase.

The problem is symmetric whether the majority is from the Right or from the Left. It is enough to look at the majority from the Left. The majority solves the following problem,

$$Max_f \quad \sum_{0}^{n_l} \Big(1 - \tau + V(f_i)\Big),$$

$$s.t \quad N\tau \geq n_l f_i.$$

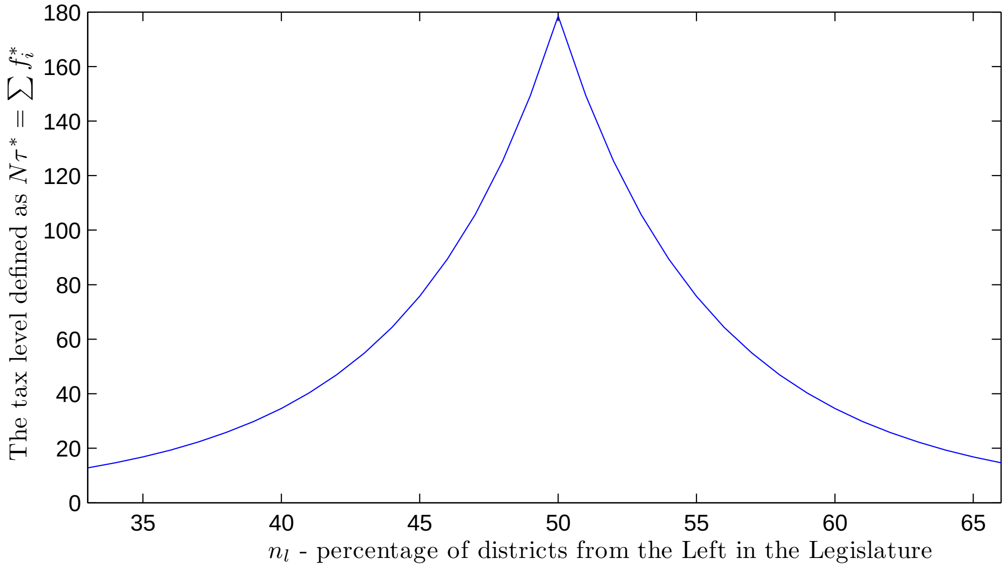
The equilibrium tax level is given by

$$\tau^* = \frac{n_l}{N} V_f^{-1}\left(\frac{n_l}{N}\right).$$

The tax level is decreasing in n_l for a majority from the Left and decreasing in $100-n_l$ for a majority from the Right. The highest tax level is at 50%. As the majority increases, more districts internalize the cost of taxation and the tax level decreases. This is true as long as $V(.)$ is strictly concave. Also note that the model predicts no discontinuity in the tax level at the 50% cutoff. In Figure 4, we can see the results of the model graphically for the functional form $V(.) = f^{\frac{9}{10}}$.

[14] In most states the Governor or a budget agency produces the first draft. We skip this step as once the budget reaches the Legislature it can be amended at will.

Figure 4: The tax level predicted by the model with $V(f) = f^{9/10}$ (states with the block veto)



2 Empirics

2.1 Data

Our data set comprises the American states from 1960 to 2006.[15] The majority of American States (thirty-four) give their Governors line-item veto power and require a two-thirds majority in the Legislature for this veto to be overridden. Since the model we present in Section 1 presupposes a strong Governor with the power to cut transfers, we focus our empirical analysis on these states.[16] In section 2.10, we look at the states in which the

[15]Most of our political, fiscal, and population variables are the same as those used by Besley and Case (2003). We are thankful to Timothy Besley and Anne Case for making their data sets available to us. We have updated their sample from 1960 to 1998 with data from 1999 to 2006. We have used data from the Census Bureau, the National Association of State Budget Offices (NASBO), and the National Conference of State Legislatures (NCSL)

[16]In total there are 50 states. Most states have the line-item veto throughout, but some adopted it within the period covered by our sample. They enter our sample at the time of adoption. We exclude the six states with the block veto throughout our sample. These are Indiana, Nevada, New Hampshire, North Carolina, Rhode Island and Vermont. We exclude the states that have the line-item veto but that have other majority requirements for a veto override (usually 50%). These are Alabama, Arkansas, Illinois, Kentucky, Tennessee. California is excluded because it requires a two-third majority to approve the budget. We have also excluded Alaska, Hawaii, Nebraska, and Minnesota because of missing data. This leaves us with 34 states in our line-item-veto sample making 1,524 observations.

Governor has block veto.

Our variable for the tax level is *taxes_GDP*, It is defined as the sum of state income, corporate, and sales taxes divided by state GDP. In line with Persson and Tabellini (2004), we focus on government size relative to GDP. For our robustness checks we show results using the expenditure levels as an alternative measure of government size. Expenditure is not our preferred measure as it contains both federal transfers and local property taxes revenues, which are not decided at state level. The average tax level in an American state is around 5.5% of GDP, whereas the average state expenditure level is around 10% of GDP. [17]

For another robustness check, we show results with an alternative measure for the tax level: state taxes per capita. However, it is important to note that taxes per capita is considerably less stationary than tax revenues over GDP. This can be seen in Table 1. The average taxes per capita across states with the line-item veto in 1982-dollars during the 1960s is $346. This jumps to $580 in the 1970s and continues to increase thereafter.

Table 1: Different measures of the states' tax level

Measure	1960s	1970s	1980s	1990s	2000s
States with the line-item veto					
state taxes per capita (1982-dollars)	346	588	673	838	911
state taxes over state GDP (%)	4.4	5.7	5.7	5.8	5.7
States with the block veto					
state taxes per capita (1982-dollars)	361	560	658	804	864
state taxes over state GDP (%)	4.6	5.6	5.7	5.6	5.4

Note: The sample in the first three lines comprises 1524 observations of states with the line-item veto from 1960 to 2006. In the bottom three lines the sample comprises 292 observations of state with the block veto from 1960 to 2006. Each observation represents a state within a year. The tax level is measured as the total sum of a state's income, sales, and corporate taxes. Each entry is the average of all observations within a decade.

In Table 1, we can see that the average tax level in states with the line-item veto is very similar to those with block veto. Our model, however, predicts that the tax level should be *higher* in states with the block veto, and that this difference should be greater

[17] Another potential dependent variable would be transfers received by district. Unfortunately identifying district level expenditure is not easy. Some new data has been produced by Aidt and Shvets (2011). They are able to identify district level expenditure to seven states from 1993 to 2004.

around the interval in which the Governor's party has around 50% of the seats. In Table 2, we can see that a state's average tax level is 7% higher in states with block veto than in states with the line-item veto. This difference is statistically significant.

Table 2: The states' tax level in the interval *Governor's strength* $\in [45, 55]$

	block veto	line-item veto	difference	SE
state taxes over state GDP (%)	5.7	5.4	0.32	(0.16**)

Note: Observations are a state in a year between 1960 and 2006. There are 279 observations for the states with the line-item veto in the interval *Governor's strength* $\in [45, 55]$. *Gov. strength* is defined as the minimum between the percentage of seats in the state House of Representatives and in the state Senate that belong to the same party as the Governor. There are 66 observations for the states with the block item veto in the interval *Governor's strength* $\in [45, 55]$. The tax level is measured as the total sum of a state's income, sales, and corporate taxes divided by state GDP.

2.2 Testing the non-linearities

As seen in Figure 3, our model predicts a non-linear and discontinuous relationship between the support that the Governor has in the Legislature (denoted by n_l in the model) and the tax level. Except in the limiting case in which $n_g = 100$, we should observe a discontinuity at $n_l = 50$. Except in the limiting case in which $n_g = 50$ the tax level should increase as the size of the majority in the Legislature (either n_l or $1 - n_l$) increases in the neighborhood of $n_l = 50$. The model also predicts that the tax level should eventually decrease as n_l increases above n_g.

To test whether these predictions are falsified by the data, we estimate a partially linear model. We are interested in the relationship between the tax level and a variable that we call *Governor's strength*. *Governor's strength* is defined as the percentage of seats that belong to the Governor's party in the Legislature – be the Governor Republican or Democratic. This variable is the empirical equivalent of n_l in the model: the percentage of seats in the Legislature that belong to the same party as the Governor. *Governor's strength* will enter the model non-linearly, while state and year dummies, and other covariates will enter the model linearly. We allow for the estimated function to be discontinuous. We can then test whether the estimated discontinuity is significant.

There are two chambers in each state[18]. To estimate the non-linear relationship we define a government as divided if at least one chamber in the Legislature is at the hands of the opposition to the Governor. We, therefore, measure *Governor's strength* as being the minimum value between the percentage of seats held by the Governor's party in the state House and in the state Senate. If the minimum is above 50%, both chambers are aligned with the Governor. If *Governor's strength* is below 50%, the government is divided.[19]

In Table 1, we see that the average government size has remained stable since the 1970s. We interpret our model as capturing small deviations from the mean government tax level at each year. Our empirical estimation reflects this interpretation.

We control for: state and year fixed effects; state population; state income per capita (in 1981 dollars); an indicator variable for whether the state has a supermajority requirement for a tax increase in that year; and an indicator variables for whether the state has expenditure limitations by law in that year. Our main concern is an omitted variable for the voters' political preferences and how they change overtime and across states; the tax level may be chosen in response to changes in these preferences. We therefore add three control variables as proxies for these preferences: a measure of turnout in the last election; an indicator variable for whether the last election was a midterm election or a general election; and an indicator variable for the political identity of the Governor.

The semiparametric model is summarized as:

$$taxes\_GDP_{st} = \beta' X + f(Governor's\ strength_{st}) + \epsilon_{st},$$

where all of the control variables mentioned in the above paragraph enter linearly in X together with state and year dummies. Each observation is a state, denoted by s, in a year, denoted by t.

[18] With the exception of Nebraska.

[19] A few observations have independent representatives. We define the *Governor's strength* based on the number of representatives belonging to the same party as the Governor. Independent representatives count as the opposition. Independent Governors have values of *Governor's strength*=0 by definition as we can not identify the party identity of independent representatives.

2.3 Estimation procedure

The easiest way to estimate this model is to include a power series for the variable *Governor's strength*; one series for each side of the cutoff. The result of this procedure can be seen in Table 3. To determine the degree of each series we stopped adding terms when the extra term was not precisely estimated. This procedure yields a quartic-polynomial to the left of the 50% cutoff and a quadratic-polynomial to the right. The discontinuity in the function at the cutoff *Governor's strength*=50% is statistically significant. The result implies an increase in the tax level in the order of 6% at the 50% cutoff. We have performed a series of robustness checks that are available on the on-line appendix, appendix B: the shape and discontinuity of the function are robust to being estimated without any controls, with state and year dummies only, with different combinations of controls, to excluding the observations in which a supermajority requirement for a tax increase is in place, to excluding the southern states, and to estimating the function with an alternative dependent variable: the state tax level per capita.

A potential issue with the power series estimator is that it may be sensitive to the polynomial degree. We have therefore implemented a semiparametric procedure as presented by Robinson (1988), usually called the partially linear model. The non-linear part is estimated non-parametrically, so that we do not impose any restrictions on its actual shape. The linear part of the model is estimated as in any linear model. We describe the estimation procedure of the non-parametric part of the model in the Appendix.

2.4 Governor's strength and the tax level

The results of both estimation procedures can be seen in Figure 5.[20] The solid line plots the function estimated with the power series and the crosses are the point estimates of the semiparametric procedure. The dots are the local averages from the semiparametric

[20]If the density of g is zero or close to zero at any point, the estimator is unreliable. We follow Robinson (1988) and solve this problem by trimming 1% of the lowest density points of g. This trimming makes the sample in which we run the power series and the semiparametric method not identical. In the tables we have not performed the trimming. The estimates with and without trimming are virtually identical.

Table 3: Dependent Variable: *taxes_GDP*

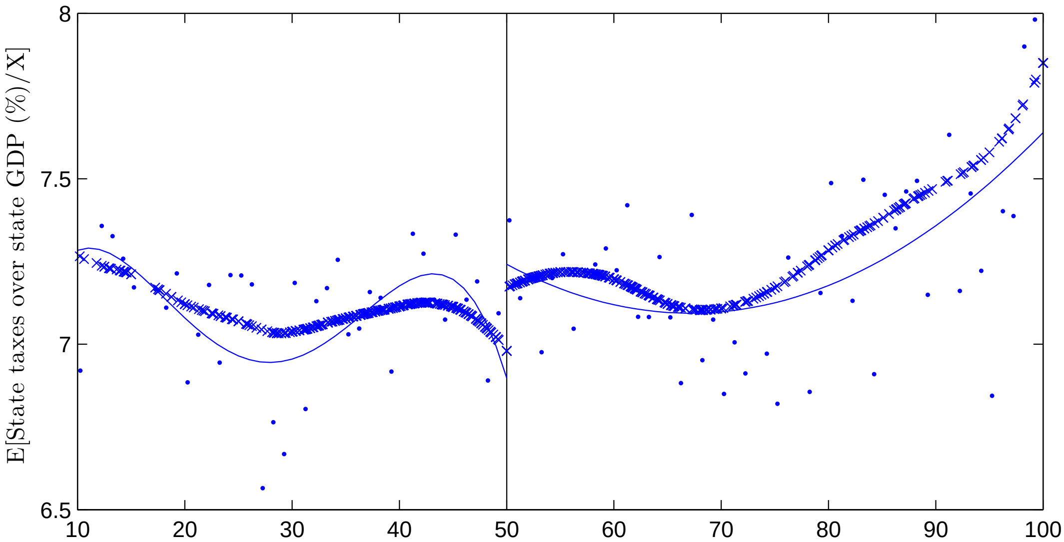
constant	6.79
	(0.81)***
$Gov.\ strength \times (1 - right)$	15.81
	(5.24)***
$Gov.\ strength^2 \times (1 - right)$	-138.78
	(45.14)***
$Gov.\ strength^3 \times (1 - right)$	409.39
	(134.39) ***
$Gov.\ strength^4 \times (1 - right)$	-388.36
	(128.40)***
$right$(1 if $Gov.\ strength > 50$)	2.58
	(1.14)**
$Gov.\ strength \times (right)$	-6.82
	(3.12)**
$Gov.\ strength^2 \times (right)$	5.09
	(2.20)**
Discontinuity	0.33
at *Gov. strenth*=50	(0.16)**
R-squared	0.84

Note: This sample comprises 1524 observations of states with the line-item veto and an override requirement of two-thirds from 1960 to 2006. Standard errors in parenthesis are clustered by state (34 groups). The symbol $*$ means that the estimated coefficient is significant at 10%; $**$ significant at 5%; $***$ significant at 1%. The control variables in the above regression are: state and year dummies, state population, state income per capita, an indicator variable for whether the state has a supermajority requirement for a tax increase in that year, an indicator variables for whether the state has a binding expenditure limitations in that year, an indicator variable for whether the election was midterm, an indicator variable for the party identity of the Governor, and turnout in the last election. The estimated function is plotted in Figure 5 with a solid line.

procedure.

The Governor's power in our model is to veto the budget. In most states their veto may be overridden by a two-third majority in the Legislature. We have therefore focused our model on the interval *Governor's strength* $\in (33.\overline{3}, 66.\overline{6})$. Note that in Figure 5 the tax level increases when we move away from the 70% mark or as we move away (leftwards) from the 30% mark. This is interesting because these inflection points are close to the requirement for the majority in the Legislature to override the Governor's veto. This suggests that the mechanism that determines the tax level is different where the veto is active to where it is not. In the main text we focus our discussion on the shapes in the interval we analyzed in section 1: $(33.\overline{3}, 66.\overline{6})$. We have an extension of our theoretical model that is able to rationalize the shapes we estimate for the whole of the support, this extension is available in the supplemental material.

Figure 5: Semiparametric estimation: state tax level and *Governor's strength*



Governor's strength: seats held in the Legislature by the Governor's party (%) - min{House, Senate}
· local average, × local linear, – polynomials

In Figure 5 we can see that the tax level is on average higher on the right side of the graph, where the same party controls both the Governorship and the Legislature. The discontinuity at *Governor's strength* = 50% is positive and statistically significant.

Note that as we move away from the 50% cutoff either to the left or to the right, the semiparametric estimates show taxes first rising and then falling, before picking up again in the intervals $(66.\overline{6}, 100)$ and $(0, 33.\overline{3})$. The power series estimates are similar to the left of the cutoff, but to the right of the cutoff the estimated function is decreasing in the interval $(50, 66.\overline{6})$.

These estimates are in line with the predictions or our model in Figure 3. From Table 3 we can see that the estimated shape for power series estimator is statistically robust and so is the discontinuity. The main features of the function are also statistically robust with the semiparametric method, which we discuss in the appendix.

Overall the shapes of the function we estimate in Figure 5 do not seem to reject the non-linearities predicted in our model. The exact shape predicted by our model depends on which districts have voted for the Governor. The function estimated semiaparametrically closely resembles what our model predicts with $n_g = 57$. A more thorough test of our model would require data on the vote share of the Governor in each state district. We have been unable to find this level of detail in electoral data across the states and across time to pursue this project further.

2.5 Regression discontinuity design

In this section we discuss whether we can implement a regression discontinuity design to the jump in the tax level we observe in Figure 5 at *Governor's strength*=50%. As n_l crosses the 50% cutoff from left to right the government goes from divided to unified and taxes jump up. If we can show that slim majorities of one or two seats can be interpret as quasi-experiments (in the same way that close election have been, see for example Lee (2008) and Caughey and Sekhon (2012)), we would be able to determine a clear causal relationship between whether the government is unified or divided and the tax level. This is an important complement to the result in Figure 5, which depends on a series of parametric assumptions.

The estimation procedure for the regression discontinuity design is similar to that of Figure 5 and Table 3, except that we do not include control variables or fixed effects in the estimation. We estimate one function on each side of the cutoff. The solid line plots the function estimated with the power series and the crosses are the point estimates of the non-parametric procedure (a local linear regression, which is defined in detail in the Appendix). The dots are the local averages.

For the regression discontinuity design the forcing variable is *Governor's strength in the House*, which we define as the percentage of seats in the state House of Representatives that belong to the same party as the current Governor. The reason why the forcing variable is *Governor's strength in the House* and not *Governor's strength* is because elections for the state Senates do no lend themselves to a regression discontinuity design. In the appendix we argue this point in detail.

The outcome variable is the state tax level. If the forcing variable is above 50%, the observation receives treatment. The treatment is an "unified government". At each period, a state is either assigned the treatment or not. For the observations in which the election for the state House delivered a slim majority, we argue that the assignment of treatment was as if it were random. If this is the case, differences in the average tax level between the treated group and the control group are an estimation of the treatment effect.

2.6 Discontinuity in the tax level

Our result for the regression discontinuity design is summarized in Figure 6 and Table 4. Since we are focusing on the 50% cutoff, we estimate the discontinuity with all states that have the line-item veto, and not only those with two-thirds override rule.

We estimate a statistically significant jump in the tax level around the cutoff point: *Governor's strength in the House* = 50%. To the right of the cutoff point, the government is unified; to the left, the government is divided. The parametric quartic specification and the local linear regression [21] yield very similar results: a discontinuity of around

[21] Nonparametric results are sensitive to bandwidth choice. Imbens and Kalyararaman (2009) propose a method to calculate an optimal bandwidth specifically for regression discontinuity design. Because most of our data seem to be concentrated around the 50% cutoff (see Figures B1 and B2 in the Appendix),

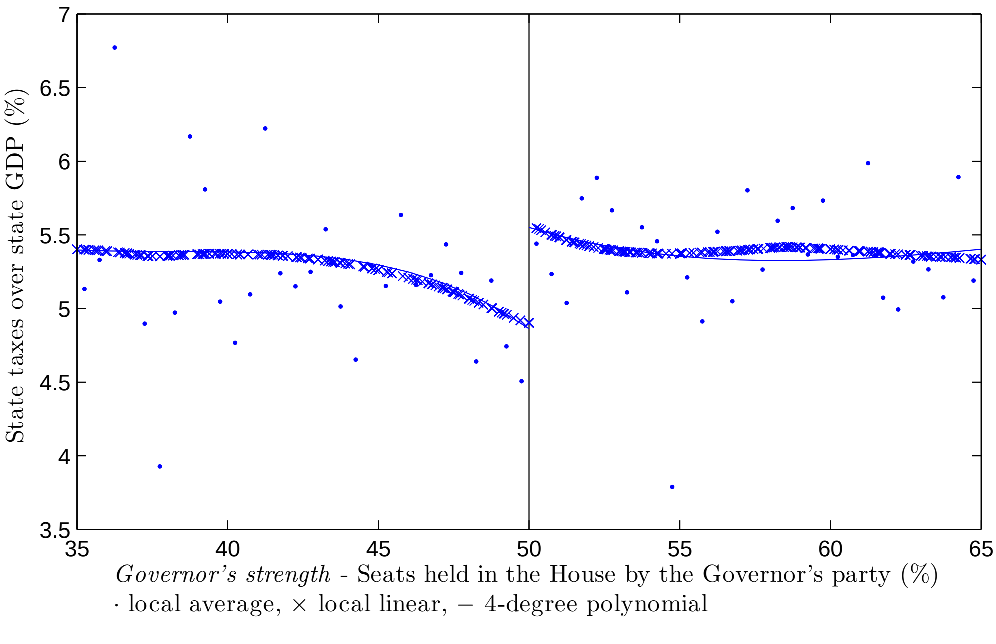
0.67. This is significant at the 1% level with heteroskedastic robust standard errors, and significant at the 10% level with standard errors robust to clustering by state. For presentation purposes we only report the cluster-robust standard errors. An estimate of 0.67 implies an increase in the average tax level from 5% to 5.67% of GDP - a 13% increase. The result is robust to excluding one state at at time, so that we know the result does not depend on any single state, and to excluding one decade at a time; these are available on the on-line appendix, appendix B.

Table 4: State tax level and *Governor's strength in the House*

Method	Jump at 50%	Bootstp mean	SE
4-degree polynomials	0.69	-	(0.35)*
LLR(bandwidth 7)	0.66	0.60	(0.36)*

Note: This sample comprises 1712 observations of states with the line item veto from 1960 to 2006. Theoretical cluster robust standard errors are provided for the polynomial regression together with bootstrapped cluster-robust standard errors by state for the nonparametric regression (wild bootstrap with 10,000 draws each).

Figure 6: Nonparamtric: state tax level and *Governor's strength in the House*



In Figure 6, we focus on the data surrounding the discontinuity. One can see the statistical strength of the estimated discontinuity: the parametric and nonparametric

we apply their method to the data within the medians of the samples to the left, and to the right of the 50% cutoff. The optimal bandwidth for the subsample between the two medians is 7.

estimates to the left of the cut off point lie below all of the local averages to its right in the interval (50, 65], with one exception. The outlier local average at the 55% mark is due to two observations: Ohio in 1965 with a tax level of 2.8%, and Ohio in 1966 with a tax level of 2.8%. Similarly, the estimate to the right of the cutoff is higher than most of the local averages to the left, with the exception of a few that are far from the cutoff. Note also in Figure 6 the negative slope to the left of the 50% cutoff. Our model in Section 1 provides a rational for feature of the data.

It is interesting to compare the result in Figure 6 with the results in De Magalhães (2011), where the author presents a regression discontinuity estimate in the same sample but where the forcing variable is the percentage of seats the Democrats have in the state House. De Magalhães (2011) finds no jump in the tax level at the 50% cutoff point, which indicates no causal relationship between the partisan control of the state House and the tax level. Considering our result and the result in De Magalhães (2011) it seems that the tax level is determined by whether the government is divided or unified, and not by whether the Democrats or the Republicans are in power.

2.7 Checking the validity of the design

To test for the validity of the design, it is important to check if any other covariate is discontinuous at the 50% cutoff. If this were the case, it could indicate that the "randomization" did not work. In Table 5, we show that there are no significant discontinuities for most of the covariates.

Row 1 in Table 5 shows that observations on both sides of the cutoff are as likely to have a Senate aligned with the Governor as in opposition to the Governor. This is an important result. Even though the Senate role in setting the budget is as important as that of the House, around the cutoff at least, the discontinuous change in political control comes from the House only. Row 2 shows a similar result for a variable indicating the partisan identity of the Governor.

As Table 5 demonstrates, there are no discontinuities in variables such as turnout, on

Table 5: Other covariates and *Governor's strength in the House* - quartic-polynomial specification

Variable	Jump at 50%	SE
Governor's party control over the Senate	-0.05	(0.14)
Democratic Governor	-0.21	(0.14)
Turnout	-0.03	(0.03)
Midterm election	-0.09	(0.11)
Population	0.75	(1.67)
Income per capita	0.19	(0.84)
Unemployment rate	0.00	(0.44)
Local property taxes	-0.12	(0.37)
Tax and expenditure limitations	-0.05	(0.13)
Supermajority requirements	-0.15	(0.09)*

Note: This sample comprises 1712 observations of states with the line item veto from 1960 to 2006. The forcing variable is *Governor's strength in the House*, which is the percentage of seats in the state House of Representatives that belong to the same party as the Governor. The discontinuity is estimated at *Governor's strength in the House* = 50% with a 4-degree polynomial on each side of the cutoff. Theoretical cluster-robust standard errors by state are in parenthesis.

the indicator variable for midterm elections, population, income per capita, local property taxes, and on an indicator variable for for the presence tax and expenditure limitation. We do find a significant discontinuity for an indicator variable for a supermajority constraint.[22] This discontinuity is not robust to the non-parametric specification and the main result in Table 4 is robust to excluding the 240 observations with supermajority requirements. We therefore do not see this as a threat to the validity of the design.

2.8 Empirical test for the states with the block veto

If it is indeed the case that the line-item veto is a key feature in explaining the tax level as our model predicts, it must be that the empirical relationship between *Governor's strength* and the tax level be different in the states with the block veto. We show in

[22]In principle, when such a requirement is adopted, it is no longer enough to hold 50% of seats to formally raise the tax level, which makes dealing with the observations that have supermajority requirements more problematic than dealing with other covariates. One option for dealing with the 240 observations with supermajority requirements is to drop them entirely, which does not change the results. Another option would be to define the forcing variable as the distance from the cutoff so that the 66.6% cutoff is pooled with the 50% cutoff. However, in the states with supermajority requirements, the budget is still approved by a simple majority. The two cutoff points are not directly comparable.

this section that this is indeed the case. The states with a block veto are a in minority in comparison to those with the line-item veto and there are only 290 observations. In Table 6, column 1, we present the results for the power-series estimates of the function and discontinuity without any controls or fixed effects. In column 2 we include state and year dummies and the same controls as in Figure 5.

In Table 6 we can see that the shape of the estimated function is not robust to the two different specifications. This may be due to the small numbers of observations. Since we can not robustly estimate a functional form for the states with the block veto, it becomes hard to test the prediction of our model regarding the shape of the relationship between the tax level and *Governor's strength*. The graph for both functions in column 1 and 2 are available on the online appendix, appendix B.

An important prediction of our model regarding the states with the block veto is that there should be no discontinuity in the tax level at the cutoff *Governor's strength*=50%. In Table 6 we can see that this is the case. The discontinuity is not significant whether we include controls and fixed effects or no controls at all. Moreover, the point estimate of the discontinuity once we have included controls and fixed effects is close to zero. This results lends support to the interpretation of our model, that it is the line-item veto that generates the budgetary separation of powers in the states.

Table 6: States with the block veto. Dependent Variable: $taxes\_GDP$

	(1)	(2)
constant	5.14	8.47
	(1.25)***	(0.74)***
$Gov.\ strength \times (1 - right)$	-1.85	8.03
	(7.72)	(2.61)***
$Gov.\ strength^2 \times (1 - right)$	6.26	-11.04
	(19.30)	(3.73)***
$right$(1 if $Gov.\ strength > 50$)	19.30	-0.40
	(4.71)***	(1.55)
$Gov.\ strength \times (right)$	-57.64	5.28
	(13.47)***	(4.50)
$Gov.\ strength^2 \times (right)$	41.77	-3.99
	(9.65)***	(3.24)
Discontinuity	0.28	-0.02
at *Gov. strenth*=50	(0.37)	(0.13)
Controls	No controls	State and Year Dummies and additional controls
R-squared	0.08	0.93

Note: This sample comprises 290 observations of states with the block veto from 1960 to 2006. Each observation represents a state within a year. The dependent variable is the total sum of a state's income, sales, and corporate taxes divided by state GDP and shown as a percentage. The explanatory variable is *Gov. strength*, which is the minimum between the percentage of seats in the state House of Representatives and in the state Senate that belong to the same party as the Governor. The variable *right* takes value 1 if $Gov.\ strength > 0.5$ and zero otherwise. Standard errors in parenthesis are robust to heteroskedasticity. The symbol $*$ means that the estimated coefficient is significant at 10%; $**$ significant at 5%; $***$ significant at 1%.

3 Concluding Remarks

The hypothesis that the separation of powers has an affect on the tax level as predicted by Persson et al. (2000) had so far only been tested indirectly. The empirical work has focused on Presidentialism vs. Parliamentarism, as Presidentialism is usually treated as an equivalent concept to the separation of powers.

Persson and Tabellini (2004) focus on cross country data and have two main results. The first result, that a majoritarian electoral system leads to a smaller government, has been replicated in a larger sample by Blume et al. (2009) and corroborates similar results by Milesi-Ferretti and Perotti (2002). The second result, that a Presidential regimes induces a smaller government is not robust to the extension of the sample by Blume et al. (2009) and, to the best of our knowledge, has not found support elsewhere.

Whereas these studies focus on Presidentialism as a proxy for the separation of powers, Presidentialism does not imply *budgetary* separation of powers. In most Latin American countries, for example, the President has both the power to determine expenditures and to increases the tax level, sometimes by decree. In these countries the President decides on the tax level and is the residual claimant of a tax increase.

In our model we have described how in the American states with the line-item veto, the bargaining game between the Governor and the Legislature implies *budgetary* separation of powers. We have also show how the effectiveness of this separation depends on the political configuration at a given point in time. We have found empirical evidence that, when it is effective, the *budgetary* separation of powers does have a negative effect on the tax level. In particular we have found a clear jump in the tax level as the government moves from divided to unified: taxes go up.

It is interesting to contrast our result with De Magalhães (2011), who finds no jump in the tax level as the Democrats cross the threshold of 50% of the seats. This result indicates no causal relationship between the partisan control of the state House and the tax level. Brought together, the results in De Magalhães (2011) and our results suggest that the tax level is determined by whether the government is divided or unified, and not by whether the Democrats or the Republicans are in power.

A Appendix

A.1 Proof Proposition 1.2

Proof The proof for all four pure-strategy Nash equilibria is the same. So let's consider the case where independents have voted for the Left in both elections.

First let's consider a district that has voted as an independent in both election. As we know from proposition 1.1, only districts that are part of the legislative majority and of the Governor's support receive positive transfers in equilibrium. Any deviation, that is, voting for the Right in either election, implies that the district will receive zero transfers instead of a positive amount.

Now let's consider a district that has voted as an independent in one election and ideologically in the other election. Note that given the lexicographic preferences, districts do not deviate from their ideological vote. There are two cases. In the first case suppose the district votes for the Left in both election. Deviating (voting for the Right in the independent election) implies that the district would go from positive to zero transfers.

In the second case suppose the district has voted for the Right in its ideological election. Deviating (voting for the Right in its independent election) would not change the fact that the district receives zero transfers in equilibrium. What does change, however, is that the district is no longer counted in either the legislative majority (if its independent election was the legislative election) or in the Governor's support (if its independent election was the gubernatorial election). Being part of a majority increases the monetary utility of a district in equilibrium even if the districts receives zero transfers. This is so because the majority (either the Governor or the legislative majority) will weight the district's utility when deciding the overall level of transfers. For a district that receives zero transfer in equilibrium, taxation is only a cost; the optimal policy is $\tau = 0$ and $f_i = 0$ for all i. By being part of the majority this district marginally decreases the amount of taxes it has to pay in equilibrium. For this reason such a district has no incentive to deviate from voting with the winning majority in its independent election.

A.2 Proof Corollary 1.3

Proof There are two cases to consider. The first is the case of a divide government. Without loss of generality, assume that the Left has won the first election and the Right has won the second election. There are three possible cases of vote splitting: $[L_{in}, R_{in}]$, $[L_{id}, R_{in}]$, $[L_{in}, R_{id}]$, where the subscript id is for a district that voted for ideological reasons and in for a district that voted as an independent. Assumption 3 implies there is no $[L_{id}, R_{id}]$ or $[R_{id}, L_{id}]$. The other possible vote-splitting patterns are: $[R_{in}, L_{in}]$, $[R_{id}, L_{in}]$, $[R_{in}, L_{id}]$. Neither of these three patterns occur in equilibrium because as we know from proposition 1.1 all independents vote for L in the first election and for R in the second election.

The second is the case of an unified government: the same party won both elections. Without loss of generality, assume that the Left has the majority in both elections. This means that all independents have voted for L and that all the votes for R were ideological. Also without loss of generality, let's assume that in the first election the fraction of districts that voted for R was smaller than the fraction of districts that vote for R in the second election. Since all independents voted for L only one pattern of vote-splitting is possible: $[L_{in}, R_{id}]$. The alternative pattern would be $[R_{id}, L_{in}]$, but this pattern is ruled out by assumption 2: all districts that voted for R in the first election (where ideology is not as salient) must also vote for R in the second election (where ideology is more salient).

A.3 Transfer and the tax level cases 2, 3, and 4

The second case is the one in which $n_l < n_g$ and $n_l > 50$. In our example, this is the interval in which $n_l \in (50, 57)$. Note that the size of the legislative majority is less than the size of the Governor's support. This implies that the Governor would like a lower tax level than would the majority . This is so because some of the districts in the Governor's support are not offered any transfers, and the Governor must internalize the cost of taxation for these districts, which are in n_g but not in n_l. In this case, at the veto stage, the Governor will trim down transfers. In practice, the Governor chooses the level of transfers and the majority chooses which districts receive positive transfers.

The Governor maximizes the utility of the districts in their support,

$$Max_f \sum_0^{n_g} \Big(1 - \tau + V(f_i)\Big),$$

facing the constraint that only those in n_l receive positive transfers,

$$\begin{aligned} s.t\ \ N\tau &\geq n_l f_i \\ f_i &\geq 0\ if\ i \in n_l \\ f_i &= 0\ if\ i \notin n_l. \end{aligned}$$

The equilibrium tax level is given by

$$\tau^* = \frac{n_l}{N} V_f^{-1}(\frac{n_g}{N}).$$

Note that for a fixed n_g, as n_l increases the tax level increases.

The third case is the one in which $n_l < 50$, $n_g > 50$, and $100 - n_l < n_g$. This corresponds to the interval in which $n_l \in (43, 50)$. The legislative majority is from the Right and has size $100 - n_l$. In this case, the size of the Governor's support is larger than the size of the legislative majority. A larger support implies that the Governor internalizes more of the cost of taxation than the legislative majority. In practice, the Governor chooses the level of taxation. The constraint is that only the districts in the overlap, that is, $n_g - n_l$ districts, receive positive transfers.

The Governor maximizes the utility of the districts in their support,

$$Max_f \sum_0^{n_g} \Big(1 - \tau + V(f_i)\Big),$$

facing the constraint that only those in $n_g - n_l$ receive positive transfers,

$$s.t \;\; N\tau \geq (n_g - n_l) f_i.$$

$$\begin{aligned} s.t \;\; N\tau &\geq (n_g - n_l) f_i \\ f_i &\geq 0 \; if \; i \in n_g - n_l \\ f_i &= 0 \; if \; i \notin n_g - n_l. \end{aligned}$$

The tax level in this interval is given by

$$\tau^* = \frac{n_g - n_l}{N} V_g^{-1}(\frac{n_g}{N}).$$

In this interval, for a fixed n_g, an increase in the size of the majority (that is, an increase in $100 - n_l$) implies an increase in the tax level.

In the last case, $n_l < 50$, $n_g > 50$, and $n_g < 100 - n_l$. This corresponds to the interval in which $n_l \in (33.\overline{3}, 43)$. The government is divided but the size of the legislative majority is larger than the size of the Governor's support. This implies that the majority chooses the level of transfers, with the constraint that only those in the overlap receive positive transfers.

The majority maximizes the utility of all its members,

$$Max_f \quad \sum_{100-n_l}^{100} \Big(1 - \tau + V(f_i)\Big),$$

facing the constraint that only those in $n_g - n_l$ receive positive transfers,

$$\begin{aligned} s.t \;\; N\tau &\geq (n_g - n_l) f_i \\ f_i &\geq 0 \; if \; i \in n_g - n_l \\ f_i &= 0 \; if \; i \notin n_g - n_l. \end{aligned}$$

The equilibrium tax level is given by

$$\tau^* = \frac{n_g - n_l}{N} V_g^{-1}(\frac{100 - n_l}{N}).$$

In this interval, the effect of an increase in the size of the majority (an increase in $100-n_l$) has an ambiguous effect on the tax level. As in the preceding case, an increase in $100-n_l$ has a positive effect on the tax level through the term $(n_g - n_l)$. On the other hand, the effect of an increase in $100 - n_l$ through the term $V_g^{-1}(\frac{100-n_l}{N})$ is negative. If $V(.)$ is concave enough, the overall effect is a decreasing tax level; otherwise the tax level increases.

A.4 Non-parametric estimation

In this section we describe the non-parametric procedure to estimate both the non-parametric component of the partially linear model we have described in section 2.1 and to estimate the discontinuity in section 2.8.

We use the local linear procedure as described in Pagan and Ullah (1999) p.93. Hahn et al. (2001) argue that this method fairs batter in estimating a function with a discontinuity. The method consists in minimizing the following expression for m and γ,

$$\sum_{i=1}^{n} \Big\{ y_i - m - (g_i - g)\gamma \Big\}^2 K\Big(\frac{g_i - g}{h}\Big),$$

where $K(.)$ is the kernel function, h the bandwidth, y_i the dependent variable, g_i the forcing variable, and g the point at which we are estimating the local linear regression. With $s = \frac{g_i - g}{h}$, the triangular Kernel is defined as

$$K = (1 - |s|),\ for\ s \leq 1\ and\ 0\ otherwise.$$

In words, the estimates of $\hat{y_o}$ or $\hat{x_o}$ at g_o are determined by running a linear regression restricting the data to a bandwidth around g_o.

For the parametric estimates, we present Huber-White standard errors robust to clustering by state. To estimate cluster robust standard errors for the nonparametric estimate, we use the wild cluster bootstrap. This does not require the residuals to be i.i.d.; nor does it require each cluster to have the same size.[23]

A.5 Estimation of the partially linear model

One example of the use of the partially linear model is Schmalensee and Stoker (1999). Their objective is to estimate the income elasticity of gasoline consumption in the U.S.. The non-parametric part of the model includes income and age, which are continuous, while the linear part of the model includes the discrete variables such as geographical dummies.

We estimate the model following the method described by Robinson (1988).[24] To discuss estimation, let's rewrite the model as

$$y = \beta' x + f(g) + \epsilon.$$

The identifying assumption is that $E(\epsilon|x, g) = 0$. In order to estimate β note that:

$$E(y|g) = \beta' E(x|g),$$

and by differencing the two equations above we have:

$$y - E(y|g) = \beta'(x - E(x|g)) + \epsilon.$$

The first step in the procedure is to estimate β. In order to so we need estimates for $E(y|g)$ and $E(x|g)$. We follow Schmalensee and Stoker (1999) and use a kernel estimator.

[23]Each new sample of residuals in the wild cluster bootstrap are the original residuals multiplied either by $\frac{(1-\sqrt{5})}{2} \simeq -0.618$ with probability $\frac{(1+\sqrt{5})}{2\sqrt{5}} \simeq 0.7236$, or by $1 - \frac{(1-\sqrt{5})}{2}$ with probability $1 - \frac{(1+\sqrt{5})}{2\sqrt{5}}$. For more on the wild bootstrap, see Horowitz (2001).

[24]The non-parametric part of the model can not be separately identified from a constant in X. So we do not include a constant in X and we must also drop one state dummy and one year dummy.

We use the local linear procedure as described above.

The difference in our estimation method to previous estimations of a partially linear model is that we allow for a discontinuity in $E(y|g)$. We impose a cutoff at *Governor's strength*=50. In practice we impose a different bandwidth to data near the cutoff. To give an example, our bandwidth of choice $h = 15$ [25] implies that the estimation of $\hat{y_{30}}$ at the point *g=30* includes observations in the interval $g \in [15, 45]$. For the estimation of $\hat{y_-}$ at $g = 50$ the bandwidth only includes observations in the interval $g \in [35, 50]$. For the estimation of $\hat{y_+}$ at $g = 50$ the bandwidth only includes observations in the interval $g \in (50, 65]$.

Let the estimate of $E(y|g)$ be denoted $\hat{m_y}(g)$ and that of $E(x|g)$ be denoted $\hat{m_x}(g)$. Our estimate of β come from the OLS of $y_i - \hat{m_y}(g_i)$ on $x_i - \hat{m_x}(g_i)$.

The last step of the procedure is to estimate the function $f(g)$ by running another local-linear regression of $y_i - \hat{\beta}' x_i$ on g_i. We allow the estimate of $f(g)$ to be discontinuous at *Governor's strength*=50.

For the parametric estimates, we present Huber-White standard errors robust to clustering by state. To estimate cluster robust standard errors for the nonparametric estimate, we use the wild cluster bootstrap. This does not require the residuals to be i.i.d.; nor does it require each cluster to have the same size.[26] Cameron et al. (2008) use Monte Carlo simulations to show that the wild cluster bootstrap works well, particularly when the number of clusters is small. As is shown in our results, the theoretical cluster robust standard errors in the parametric estimates are similar to those estimated by the wild bootstrap procedure with a local linear regression.

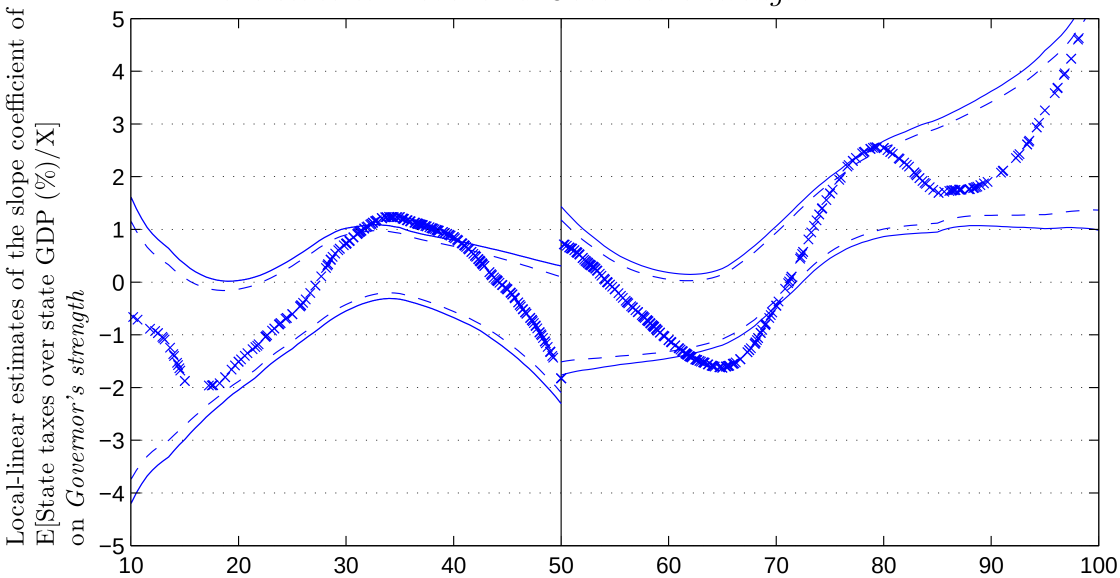
In Figure A1 We show the estimates for the slope coefficients in Figure 5 in the paper

[25]Our choice of bandwidth comes from Imbens and Kalyararaman (2009) who propose a method to calculate an optimal bandwidth in a non-parametric setting specifically for when the function is allowed to be discontinuous. Their method yields a bandwidth of 15 when applied to the tax level and *Governor's strength*.

[26]Each new sample of residuals in the wild cluster bootstrap are the original residuals multiplied either by $\frac{(1-\sqrt{5})}{2} \simeq -0.618$ with probability $\frac{(1+\sqrt{5})}{2\sqrt{5}} \simeq 0.7236$, or by $1 - \frac{(1-\sqrt{5})}{2}$ with probability $1 - \frac{(1+\sqrt{5})}{2\sqrt{5}}$. We resample the residuals 10,000 times for each regression. For more on the wild bootstrap, see Horowitz (2001).

and generate bootstrapped confidence intervals around them. This is straightforward because the local linear regression at each point gives us an estimate of the slope of the function at each point ($\hat{\gamma}$ in footnote 16). The statistically significant features of the estimated function are a positive slope in the interval above 70%, a negative slope in the interval around 20%, a negative slope immediately to the left of the 50% cutoff, and a negative slope around 60%. The local estimates of the slope for the remaining intervals are not statistically different from zero.

Figure A1: Slope coefficients of the non-parametric estimation between the state tax level and *Governor's strength*



Governor's strength - Seats held in the Legislature by the Governor's party (%) - min{House, Senate
- 95% Confidence Interval, - - 90% Confidence Interval (residual bootstrap, 1000 reps)

A.6 Forcing variable

The reason our forcing variable is *Governor's strength in the House* and not *Governor's strength* is that the Senate does not lend itself to a regression discontinuity design. In Figures B1 and B2 we perform a common test of the validity of a regression discontinuity design: we check the density of the forcing variable for a discontinuity at the cutoff. The density of *Governor's strength in the House* is not discontinuous around the cutoff. This is an indication that voters are unable to manipulate the forcing variable at the cutoff, that is, whether they deliver the House to the opposition or to the Governor's party. We do, however, observe a discontinuity in the density of *Governor's strength in the Senate.* This discontinuity in the density for *Governor's strength in the Senate* implies that voters are may be able to manipulate the forcing variable, that is, they may be able to deliberately choose divided governments more often than unified government even around the cutoff; and if this is the case the *Governor's strength in the Senate* can not be used in a valid regression discontinuity design.

Figure B1: Histogram of forcing variable - *Governor's strength in the House*

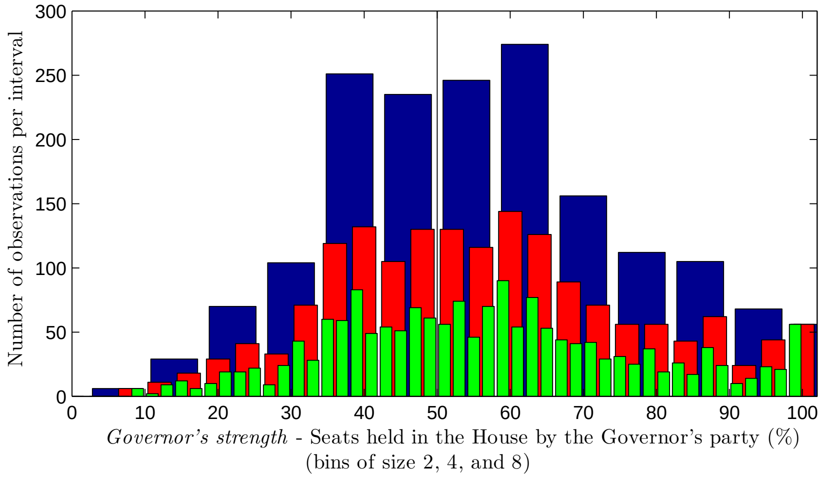
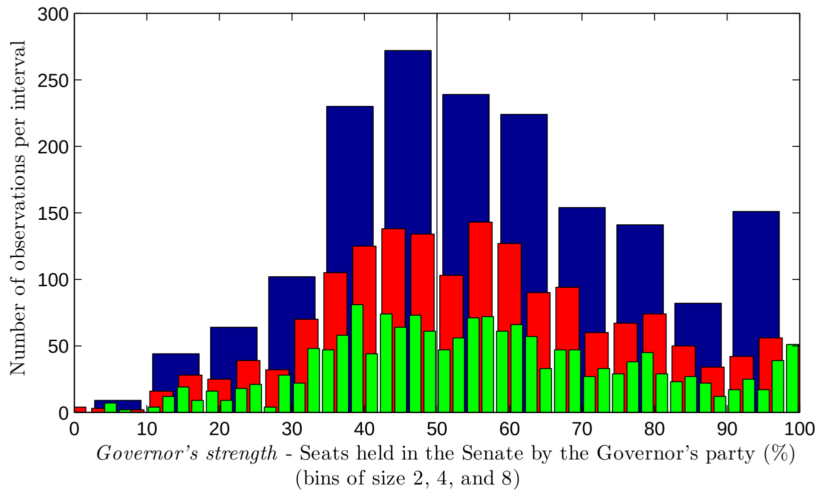


Figure B2: Histogram of forcing variable - *Governor's strength in the Senate*



In this paper the regression discontinuity relates to slim majorities instead of close elections (the latter being the usual approach, e.g. Lee (2008)). Another potential test for the validity of the design is to check whether a slim majority was itself the result of close elections in a few districts. Otherwise we may have slim majorities of one seat where every district was won in a landslide, in which case the slim majority can not be considered as if it were a random electoral result. De Magalhães (2011) shows that for the state Houses all slim majorities of one or two seat have at least one or two district level election that were themselves a close election, but that this is not the case for the state Senates.

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B Online appendix - Not for publication

B.1 Extending the model to include the intervals $(33.\overline{3})$ and $(66.\overline{6}, 100)$

In the interval $(33.\overline{3}, 66.\overline{6})$, only the districts in the overlap between the Governor's support and the legislative majority receive positive transfers. In the intervals outside, since the veto can be overridden, all of the districts in the legislative majority receive a positive f_i, with its value chosen by the majority. This feature would imply a decreasing tax level as the size of the majority increases. In this section we allow for other types of transfers, besides f_i. These transfers behave according to a common pool problem.

To introduce this common pool element, we introduce two linear transfers. We think of these transfers as pork-barrel, or the cost of doing business. If a representative is part of the legislative majority, they appropriate a fixed amount, l_i. If a representative belongs to the Governor's party, we assume that the Governor is able to transfer a value of g_i to this district, even if the Governor's party is the minority in the Legislature. These transfers are not affected by the Governor's veto power. Depending on the level of these common pool goods they will imply an increase in the tax level even as the increase in the majority is lowering the level of f_i.

Keeping the functional form we have chosen in Figure 3, section 1.5 ($V = f^{\frac{9}{10}}$), we add two linear transfers with values $l_i = 170$ and $g_i = 100$. The main features we observe in Figure 5 are present in Figure B1. Taxes are increasing as we move to the right in the interval $(66.\overline{6}, 100)$ and as we move to the left in the interval $(33.\overline{3})$. Taxes are higher on the right-hand side of the graph not only because of the results in sections 1.4 and 1.5 but also because a district that is in the majority and that belongs to the Governor's party receives both l and g. On the left-hand side of the graph, however, a district receives either l or g, but not both. The functional form assumption that we have made, together with the specific values for l_i and g_i, allow us to maintain the shapes in the interval $(33.\overline{3}, 66.\overline{6})$ as they were in Figure 3.

This model predicts discontinuities at $(33.\overline{3})$ and $(66.\overline{6})$. Even if we allow for them in the estimation, they are not statistically significant. This may be due to a failure of our model to explain the transition from where the veto sticks to the where it does not. It may also be a small sample issue. As can be seen the histogram for *Governor's strength*, Figure B2. Most of the data lies in the interval $(33.\overline{3})$ and $(66.\overline{6})$. There may be too few observations in which the legislative majority has overriding powers to efficiently estimate these discontinuities predicted by the model.

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Figure B1: The tax level predicted by the model with $V(f) = f^{9/10}$, $g_i = 100$, and $l_i = 170$

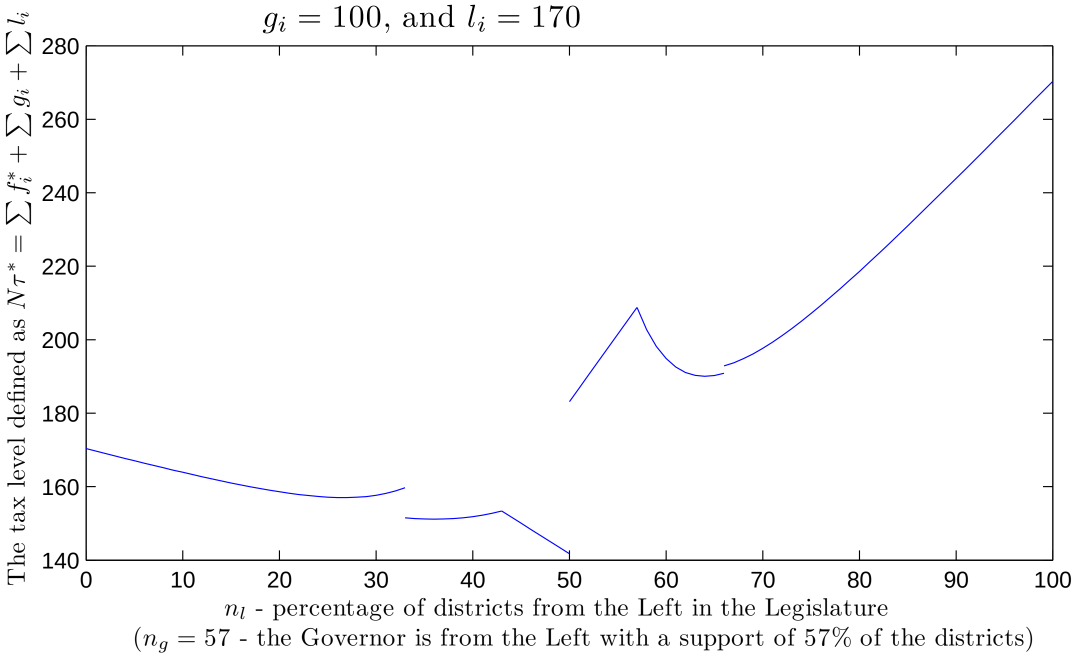

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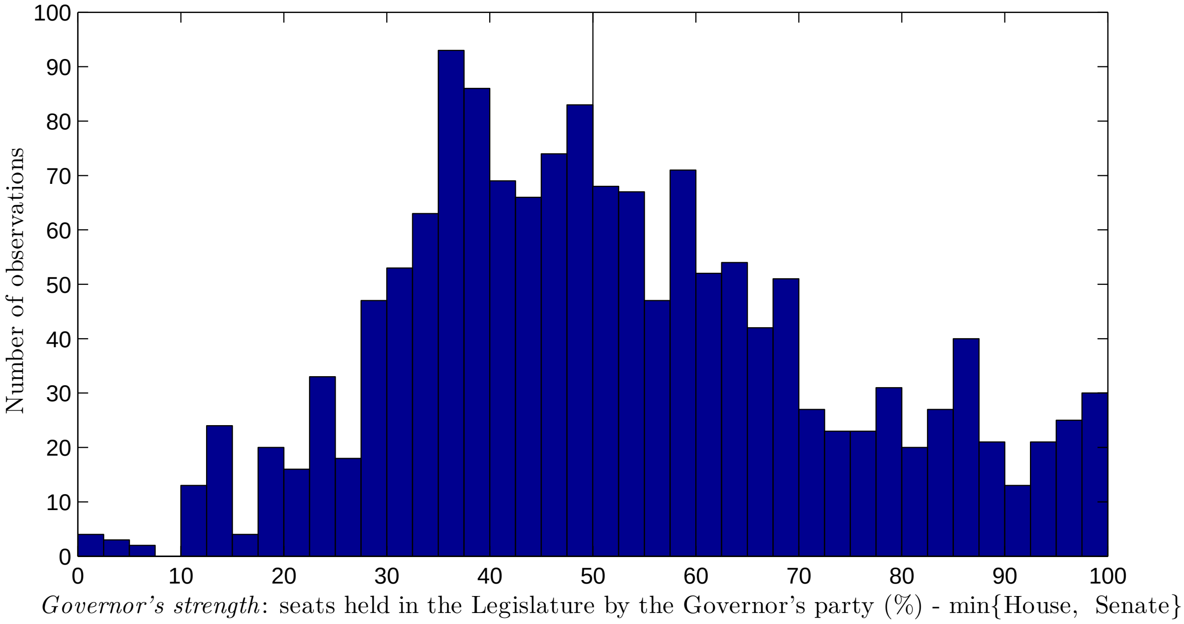
Figure B2: Histogram of *Governor's Strength*



B.2 Robustness checks of the power series estimator

Table 7: Dependent Variable: *taxes_GDP*

	(1)	(2)	(3)
constant	4.69	6.23	3.37
	(0.41)***	(0.20)***	(1.90)***
$Gov.\ strength \times (1 - right)$	30.56	16.86	15.43
	(14.37)**	(5.80)***	(5.49)***
$Gov.\ strength^2 \times (1 - right)$	-244.31	-141.56	-135.05
	(111.99)**	(49.62)***	(47.49)***
$Gov.\ strength^3 \times (1 - right)$	694.13	400.97	393.94
	(304.01)**	(144.67)***	(141.18)***
$Gov.\ strength^4 \times (1 - right)$	-651.20	-369.93	-370.38
	(273.23)**	(136.10)***	(135.08)***
$right$(1 if $Gov.\ strength > 50$)	27.53	3.61	2.90
	(14.41)*	(1.38)**	(1.13)**
$Gov.\ strength \times (right)$	-115.23	-10.45	-8.15
	(60.58)*	(3.88)**	(3.19)**
$Gov.\ strength^2 \times (right)$	160.23	8.03	6.19
	(83.61)*	(2.70)***	(2.27)***
$Gov.\ strength^3 \times (right)$	-72.08	-	-
	(37.99)*	-	-
Discontinuity	0.69	0.35	0.32
at *Gov. strenth*=50	(0.39)*	(0.19)***	(0.16)**
Controls	No controls	State and Year Dummies	plus population and institution
Sample	LIV	LIV	LIV
R-squared	0.02	0.84	0.84

Note: This sample comprises 1524 observations of states with the line-item veto and an override requirement of two-thirds from 1960 to 2006. Each observation represents a state within a year. The dependent variable is the total sum of a state's income, sales, and corporate taxes divided by state GDP and shown as a percentage. The explanatory variable is *Gov. strength*, which is the minimum between the percentage of seats in the state House of Representatives and in the state Senate that belong to the same party as the Governor. The variable *right* takes value 1 if *Gov. strength*$>$ 0.5 and zero otherwise. Standard errors in parenthesis are clustered by state (34 groups). The symbol $*$ means that the estimated coefficient is significant at 10%; $**$ significant at 5%; $***$ significant at 1%.

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Table 8: Sample exclusion: South and Super-majority

Dependent Variable: *taxes_GDP*	(1)	(2)
constant	6.42	6.53
	(0.88)***	(0.78)***
$Gov.\ strength \times (1 - right)$	18.72	18.25
	(13.6)	(10.6)*
$Gov.\ strength^2 \times (1 - right)$	-169.10	-163.84
	(83.76)*	(75.90)**
$Gov.\ strength^3 \times (1 - right)$	506.77	482.26
	(210.9)**	(206.08)**
$Gov.\ strength^4 \times (1 - right)$	-484.52	-454.79
	(184.32)**	(187.42)**
$right(1 \text{ if } Gov.\ strength > 50)$	5.53	4.14
	(2.20)**	(1.59)**
$Gov.\ strength \times (right)$	-15.89	-12.14
	(5.60)***	(4.00)***
$Gov.\ strength^2 \times (right)$	12.03	9.38
	(4.16)***	(2.74)***
Discontinuity	0.44	0.39
at *Gov. strenth*=50	(0.19)**	(0.19)**
Excluded observation	Southern states	state-years with a super-majority requirement
R-squared	0.84	0.99

Note: The sample in column (1) comprises 1195 observations of non-southern states with the line-item veto and an override requirement of two-thirds from 1960 to 2006. The states excluded from the main sample are: Florida, Georgia, Louisiana, Mississippi, South Carolina, Texas, and Virginia. Standard errors in parenthesis are clustered by state (27 groups in column (1) and 34 in column (2)). The symbol $*$ means that the estimated coefficient is significant at 10%; $**$ significant at 5%; $***$ significant at 1%. The control variables in the above regression are: state and year dummies, state population, state income per capita, an indicator variable for whether the state has a supermajority requirement for a tax increase in that year (in column (1) only), an indicator variables for whether the state has a binding expenditure limitations in that year, an indicator variable for whether the election was midterm, an indicator variable for the party identity of the Governor, and turnout in the last election.

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Table 9: Alternative Dependent Variables

	(1)	(2)
Dependent var.	taxes per capita	expenditure/GDP
constant	122	16.13
	(113)	(1.83)***
$Gov.\ strength \times (1 - right)$	1892	30.15
	(625)***	(18.18)
$Gov.\ strength^2 \times (1 - right)$	-16996	-273.56
	(5410)***	(150.60)*
$Gov.\ strength^3 \times (1 - right)$	51294	801.05
	(16118)***	(424.19)*
$Gov.\ strength^4 \times (1 - right)$	-49454	-747.79
	(15424)***	(389.63)*
$right$(1 if $Gov.\ strength > 50$)	156	5.79
	(154)	(2.64)**
$Gov.\ strength \times (right)$	-339	-15.75
	(439)	(7.4)**
$Gov.\ strength^2 \times (right)$	254	10.82
	(310)	(5.19)**
Discontinuity	31.73	0.50
at *Gov. strenth*=50	(18.68)*	(0.32)
R-squared	0.93	0.99

Note: The sample in column (1) comprises 1524 observations of states with the line-item veto and an override requirement of two-thirds from 1960 to 2006. The sample in column (2) comprises 1553 observations of states with the line-item veto and an override requirement of two-thirds from 1960 to 1998. The dependent variable in column (1) is the total sum of a state's income, sales, and corporate taxes per capita in 1981 dollars. The dependent variable in column (2) is the total state expenditure divided by state GDP. Standard errors in parenthesis are clustered by state (34 groups). The symbol $*$ means that the estimated coefficient is significant at 10%; $**$ significant at 5%; $***$ significant at 1%. The control variables in the above regression are: state and year dummies, state population, state income per capita, an indicator variable for whether the state has a supermajority requirement for a tax increase in that year, an indicator variables for whether the state has a binding expenditure limitations in that year, an indicator variable for whether the election was midterm, an indicator variable for the party identity of the Governor, and turnout in the last election.

B.3 Regression Discontinuity Design - robustness checks

B.4 Excluding decades

Table 10: Tax level and *Governor's strength*: one decade excluded at a time (4-degree polynomial)

Excluded decade	Jump at 50%	SE
1960s	0.69	(0.33)**
1970s	0.71	(0.39)*
1980s	0.79	(0.39)*
1990s	0.69	(0.40)*
2000s	0.64	(0.37)*

Note: This sample comprises state-years with the line item veto from 1960 to 2006. We exclude one decade at a time. Each regression is run with 1369, 1342, 1342, 1346, and 1449 observations, respectively. The dependent variable is the percentage of the sum of income, sales, and corporate taxes in a state divided by state GDP and shown as a percentage. The forcing variable is *Governor's strength*, the percentage of seats in the state House of Representatives that belong to the same party as the Governor. The discontinuity is estimated at *Governor's strength* = 50%. Each row shows the results for a 4-degree polynomial on each side of the cutoff. Theoretical cluster-robust standard errors by state are in parentheses.

B.5 Excluding One State at a Time

Table 11: Tax level and *Governor's strength*: one state excluded at a time (4-degree polynomial)

Excluded	Jump at 50%	Cluster robust-SE	Excluded	Jump at 50%	SE
AL	0.70	(0.35)*	AZ	0.71	(0.35)*
CO	0.72	(0.36)*	CT	0.74	(0.36)**
DE	0.73	(0.35)**	FL	0.67	(0.35)*
GA	0.69	(0.35)*	IA	0.65	(0.35)*
IL	0.64	(0.38)*	KS	0.71	(0.36)*
KY	0.66	(0.36)*	LA	0.66	(0.36)*
MA	0.57	(0.33)*	MD	0.70	(0.35)*
MI	0.70	(0.38)*	MO	0.65	(0.35)*
MS	0.74	(0.35)**	MT	0.68	(0.37)*
ND	0.72	(0.37)*	NJ	0.62	(0.35)*
NM	0.65	(0.35)*	NY	0.71	(0.36)*
OH	0.71	(0.35)*	OK	0.74	(0.35)**
OR	0.68	(0.36)*	PA	0.97	(0.33)***
SC	0.71	(0.35)*	SD	0.71	(0.36)*
TN	0.72	(0.36)*	TX	0.62	(0.34)*
UT	0.69	(0.35)*	VA	0.66	(0.35)*
WA	0.71	(0.37)*	WI	0.55	(0.31)*
WV	0.66	(0.35)*	WY	0.64	(0.36)*

Note: This sample comprises tate-years with line item veto from 1960 to 2006. Each regression is run with 1665 observations. The first exception is the regression excluding Connecticut, that has 1669 observations, as Connecticut had fours years with an independent Governor dropped. The regressions excluding Iowa, Washington and West Virginia have 1674 observations each, as these states adopted the line item veto in 1969. The dependent variable is the percentage of the sum of income, sales, and corporate taxes in a state divided by state GDP and shown as a percentage. The forcing variable is *Governor's strength*, the percentage of seats in the state House of Representatives that belong to the same party as the Governor. The discontinuity is estimated at *Governor's strength* = 50%. In each entry, we exclude from the sample the state in columns 1 or 3. Each row shows the results for a 4-degree polynomial on each side of the cutoff. Theoretical cluster-robust standard errors by state are in parentheses.

B.6 Uniqueness of Discontinuity

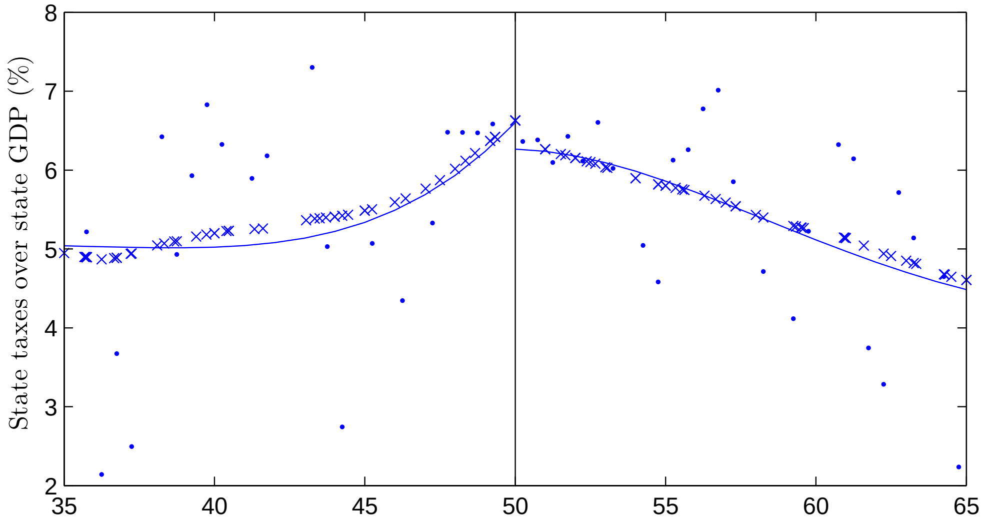
Table 12: Tax level and *Governor's strength* - alternative cutoff points (4-degree polynomial)

Cutoff point(%)	Jump	SE
45	0.29	(1.22)
46	0.36	(0.81)
47	0.27	(0.66)
48	0.00	(0.37)
49	0.35	(0.36)
50	0.69	(0.35)*
51	0.35	(0.42)
52	0.36	(0.34)
53	0.27	(0.51)
54	0.34	(0.80)
55	0.66	(0.96)

Note: This sample comprises 1712 observations of states with the line item veto from 1960 to 2006. Each observation represents a state within a year. The dependent variable is the percentage of the sum of income, sales, and corporate taxes in a state divided by state GDP and shown as a percentage. The forcing variable is *Governor's strength*, the percentage of seats in the state House of Representatives that belong to the same party as the Governor. The discontinuity is estimated at different cutoff values of *Governor's strength*. Each row shows the results for a 4-degree polynomial on each side of the cutoff. Cluster-robust standard errors are in parentheses.

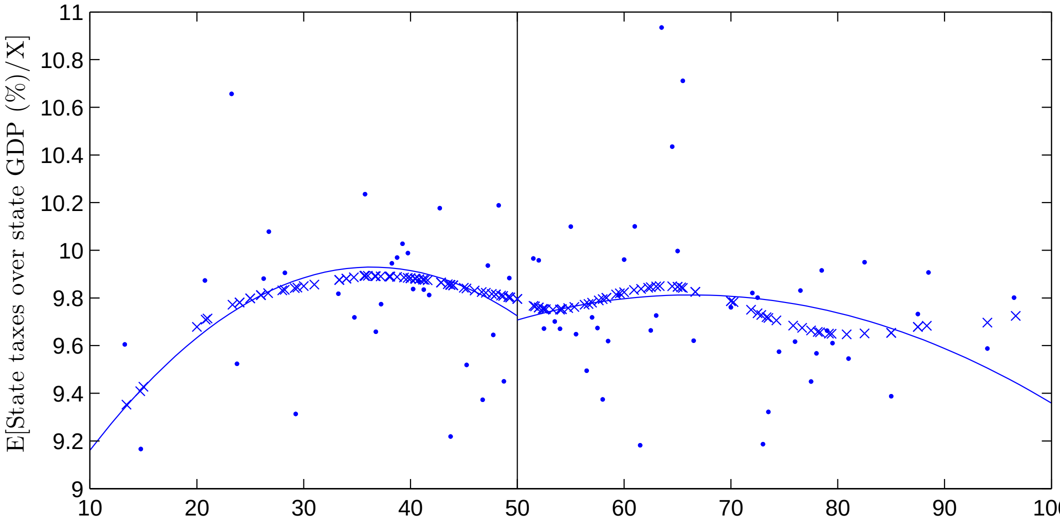
B.7 States with the Block veto

Figure C1: Nonparametric: state tax level and *Governor's strength* in states with block veto



Governor's strength - Seats held in the House by the Governor's party (%)
· local average, × local linear, – 4-degree polynomial

Figure C2: Semiparametric: state tax level and *Governor's strength* (states with the block veto)



Governor's strength - Seats held in the Legislature by the Governor's party (%) - min{House, Senate}
· local average, × local linear, – polynomial