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 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.

JEL: H00, H11, H20, H30, H71.
Key words: Separation of powers, divided government, line-item veto, tax level, semiparametric.

The separation of powers has been a key concept in political science since the Federalist papers. Its standard definition has been of a separately elected executive that does not depend on a vote of confidence by the legislature.[1].

[1]See Lijphart (1999) and Shugart and Carey (1992)

In this paper, our objective is to model the mechanism that leads the formal separation of powers between the Governors and the legislatures to affect the size of government in U.S. states. We build our model on the framework of two papers: Persson et al. (2000) and Grossman and Helpman (2008). Our model predicts a non-linear and discontinuous relationship, which links the tax level to the degree of alignment between a state's Governor and its Legislature. In order to check the data for this non-linear relationship, we estimate a partially linear model of the tax level.[2] 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.

Persson et al. (2000)'s present two models. In the first, 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 a second having the power to allocate resources. The tax level is lower in the latter. 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 is unable to pocket the marginal increase in tax revenue for either themselves or their 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[3] held by most Governors in the American states prevents the Legislature, the deciding body on both the tax level and the allocation of resources,[4] from being the residual claimant of a tax increase. We call the institutional feature that stops the agent setting the tax level from being the full residual claimant of a tax increase, the budgetary separation of powers.

According to our model, in the states in which the Governor has block-veto

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

[3]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.

[4]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).

power, the Legislature is the full residual claimant of a tax increase. As a result there is no budgetary separation of powers in the the states with the block veto. This is because the cost of using the block veto is much greater than that of using the line-item veto, as it can result in a government shut-down. [5]

The tax level is only affected by whether the government is unified or divided in the states with the line-item veto. The driving force 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), our model describes the budget as a sequential bargaining game.[6] 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, absent in Grossman and Helpman (2008) model, plays a key role in ours, even though we choose to assume that parties have no intrinsic preferences for certain tax levels.[7]

[5]For a description of government shutdown procedures see the National Conference of State Legislatures (NCSL) at www.ncsl.org.

[6]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.

[7]In Section 1.2, we discuss informally the voting model we have in mind. It incorporates aspects of ideological spatial models as in Alesina and Rosenthal (1996), and of retrospective

Our assumption that the two main American parties have no intrinsic preferences regarding the size of government comes from two recent results. Ferreira and Gyourko (2009) find no evidence that the partisan identity of the Mayor has an effect on government size. de Magalhães and Ferrero (2011) find no evidence that the partisan identity of the Majority in state Houses has an effect on government size[8]. Both of these results are based on regression discontinuity designs and therefore the causal effect is only identified at the cutoff, where both parties have close to 50% of the vote (or seats). However, these results raise the question on whether the causal effect is present or not elsewhere on the support, e.g. when a party has a clear majority.

In this paper our objective is to construct a model where parties have no clear preferences as to the size of government. We also aim to see how far such a non-partisan model can explains the relationship between the tax level and the degree of alignment between the Governor and the Legislature. Our framework is based on models that do not assume the existence of political parties, e.g. Persson et al. (2000), and Grossman and Helpman (2008).

The line-item veto has been recognized as a key institutional feature of US states and 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. Ours is a purely rent-seeking model. As a result, the

voting as in Persson et al. (2000).

[8]The recent literature has found little evidence that the Governor's partisan identity has an effect on the tax level. Besley and Case (2003), Reed (2006), and Leigh (2008) find no evidence that the party identity of the Governor affects the tax level. Besley and Case (1995) find evidence that a Governor facing term limits increases the tax level, but their result is not robust to extending the data set in time, as they do in Besley and Case (2003).

sequential bargaining game delivers clear and testable predictions on how veto power affects the size of government.

Two papers in particular relate to our empirical work. In the first, Holtz-Eakin (1988) runs a fixed effect model in a panel from 1966 to 1983, in which a dummy for the time invariant line-item veto is interacted with both a dummy for divided government and with other variables that indicate the partisan identity of the Governor. In contrast to our results, Holtz-Eakin (1988) finds that this interaction dummy is positively correlated with the overall tax revenue, for both Democratic and Republican Governors. The second and, to our knowledge, the most recent empirical work on the effects of the line-item veto, is that of Besley and Case (2003). In their paper Besley and Case (2003) use a longer data set, from 1960 to 1998, and interact a dummy for line-item veto with a dummy for divided government. In their estimates, a divided government in a state with line-item veto is negatively correlated with tax revenues per capita. This result is in line with the prediction or our model, but they do not allow for non-linearities in this relationship.[9]

The main contribution of this paper is to study, both theoretically and empirically, the non-linearities in the relationship between tax levels, and the degree of political alignment between Governor and Legislature.

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 Setup

A state is composed of N districts. Each district casts two votes, one for its representative in the Legislature and one for the Governor. In each election, a district

[9] See also Poterba (1994) and Alt and Lowry (1994) for a panel analysis of the role of divided government and other institutional features on American states. Abrams and Dougan (1986) and Alm and Evers (1991) use cross-sectional data to analyze the line-item veto. Bohn and Inman (1996) work with a panel of 47 states from 1970 to 1991. Since in their sample the line-item veto is time invariant, they regress the fixed effects on the institutional features. They also find that states with line-item veto and no-deficit rules have lower deficits.

chooses between Left and Right. We rule out the possibility that a district divides its vote for the 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. The option of allowing the government to also provide state-wide goods so that the Governor can cater for their across-districts constituency would add further complication to the model without altering its main insight.

The utility of a given district and its representative is given by

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

where y is an endowment equal to all districts;[10] 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.[11]

In the data we observe that the tax level does not change by much within the period we study.[12] This is mostly due to the substantial amount of the revenues being pre-committed to particular expenditures. We interpret f_i as the small part of the budget that is discretionary and may be targeted to districts at each period. 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.

As in Grossman and Helpman (2008) we model a bargaining game between two agents, the executive and the legislative majority. The objective function of either agent is to maximize the utility of the districts that support them.

[10]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.

[11]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.

[12]See Table 1 in Section 2.1

The budget is decided sequentially in two steps.[13] First, the 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 line-item veto power implies that if a district is part of the majority in the Legislature but is not part of the Governor's support, it will have its transfers, f_i, vetoed by the Governor. The timing of the budget game implies that if a district is part of the Governor's support but is not part of the legislative majority, it has $f_i = 0$ because the majority sees transfers to districts that do not belong to the majority as a cost. Only districts in the overlap between the Governor's support and the legislative majority receive positive transfers in equilibrium.

1.2 Defining the overlap between Governor and Legislature

Our objective is to model how different political configurations affect the tax level in U.S states. We will take election results as given and focus on how different elections results determine the amount of transfers. Since the modeling of the election stage is not the objective of our paper, we will not formalize this in detail. But we have a model in mind, in which the voting behavior of the districts regarding transfers is completely non-ideological. As in Persson et al. (2000), districts would re-elect individual politicians depending on whether they delivered the amount of transfers demanded by the district, or not. If the representative meets the district reservation utility, she is reelected. If not, she is substituted by another politician from the same party, and with a similar ideological position.

Districts choose which party to vote for on ideological grounds, exactly as described in Alesina and Rosenthal (1995).[14] In their model, both party and voter

[13] 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.

[14] In our model, ideology does not include the size of government, but it may include the type

have an ideological bliss point. In order to implement an ideological position in between the parties' preferred positions, voters may chose a divided government. One result of their model, is that only one type of split voting is observed in equilibrium. This turns out to be an important result for us as it allow us to map our theoretical results to our empirical estimation.[15]

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.

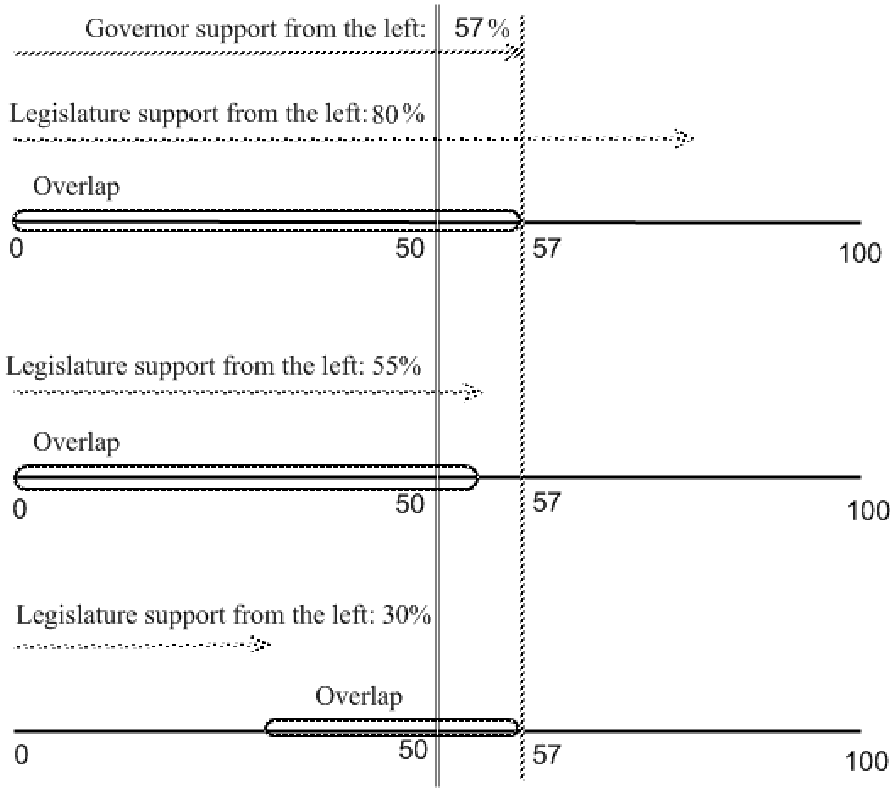
We call n_l the set of districts that have voted for the Left in the legislative election. We also stack these districts from left to right. If $|n_l| \geq 50$, the Left has the majority in the Legislature and the size of the majority is $|n_l|$. If $|n_l| < 50$, the Right has the majority in the Legislature. 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

of expenditure and any other political issue.

[15] In an election a district can potentially vote in four different ways: Left in both elections [L, L], Right in both elections [R, R], Left for Governor and Right in the legislative election [L, R], and Right for Governor and Left in the legislative election [R, L]. In order to represent our results graphically we organize the voters by stacking them from left to right according to their vote. If all four possibilities were allowed this system, would not yield an unique graphical representation.

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)



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 $57 - 30 = 27$.

1.3 The overlap and the amount of transfers

As we mentioned in section 1.1, only the districts that belong to the overlap (that is, to both the Governor's support and to the majority in the Legislature) 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[16] 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: $((33.\overline{3}, 66.\overline{6})$.[17]

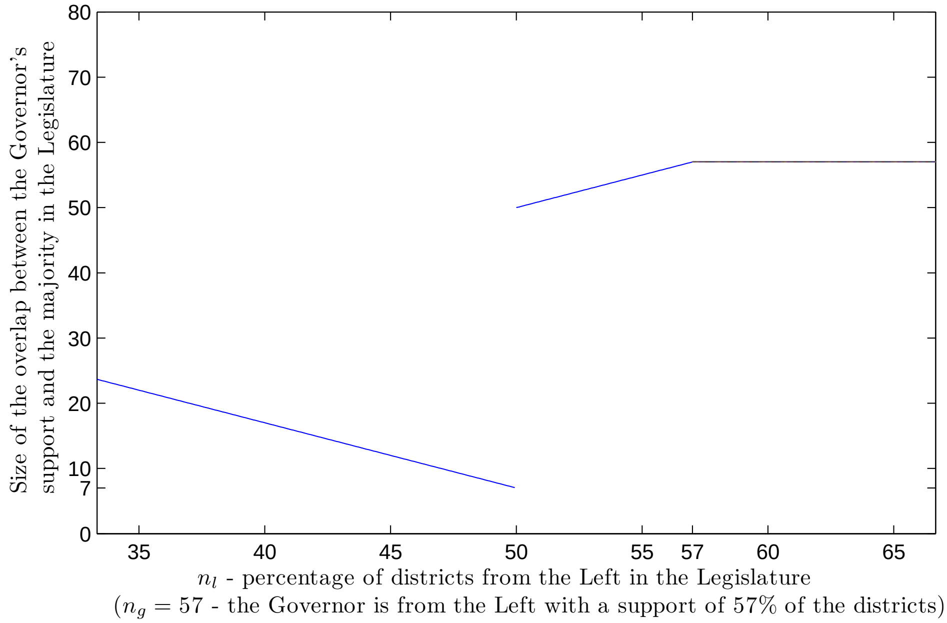
Let's first look at the interval $(33.\overline{3}, 50)$. Here the overlap is given by $n_g - n_l$, as the Right has the majority of seats in the Legislature. As we move away from the 50% point to the left towards the $33.\overline{3}$ point, the Right increases its share of seats in the Legislature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

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

[16]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.

[17]In the Appendix section B we present a simple extension of the model that takes into account how the tax level is determined outside this interval.

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



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 majority in the Legislature 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 after a certain point.

1.4 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. As we described in section 1.1, 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,

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

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

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

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.

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,

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

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

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

The equilibrium tax level is given by

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

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,

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

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

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

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,

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

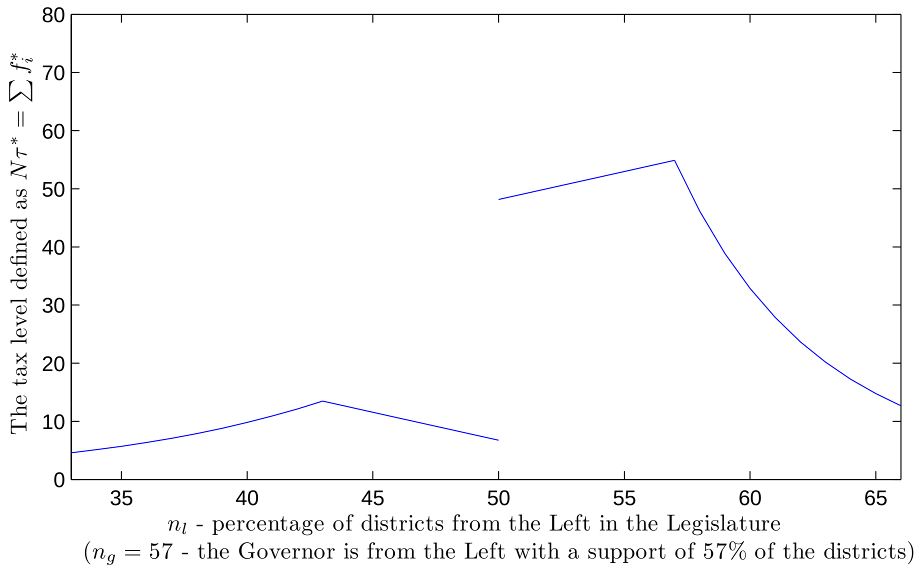
The equilibrium tax level is given by

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

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.

In Figure 3, we can see the relationship between the tax level and the percentage

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



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.

1.5 States with the block veto

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 potentially a government shut-down. During a shutdown, government employees stay at home and all government-provided services stop, except for those within essential areas. [18] 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 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. The majority will make a proposal that leaves the Governor indifferent between shutting down the government and accepting the majority's budget. The decision on the level of transfers is left to the Legislature alone. This result is in sharp contrast to the models in Holtz-Eakin (1988) and Carter and Schap (1990) where the block veto still plays a significant role in the budget decision by making the final budget closer to the Governor's preferred point.

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,

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

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

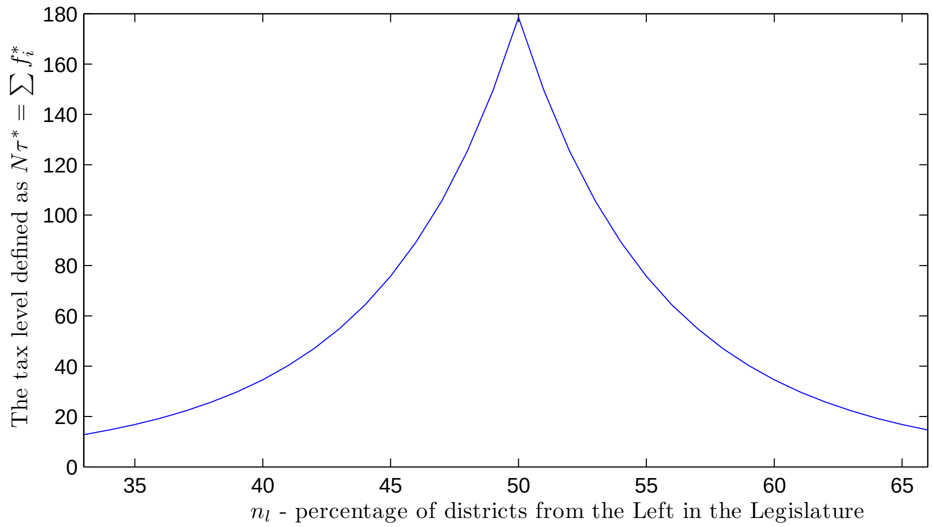
The equilibrium tax level is given by

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

[18] 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).

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 $V(.) = f^{\frac{9}{10}}$.

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



2 Empirics

2.1 Related Literature

The main contribution of our model is to generate a discontinuous and non-linear relationship between the tax level and the degree of alignment between the Governor and the legislative majority. From section 2.3 to section 2.6, we test these prediction.

If we disregard these non-linearities, our model predicts that in the states with the line-item veto a divided government leads to a lower tax level. In the states with the block veto, our model predicts no difference in the tax level between divided and aligned governments. These predictions already find support in the literature.

Besley and Case (2003) use an a panel data set from 1960 to 1998 with annual data on the American states. The dependent variable is taxes per capita. The variable of interest is an indicator variable for a divided government interacted with an indicator variable for the presence of the line-item veto in a given state in that year. [19] They control for state and year fixed effects, population variables, state income per capita, an indicator variable for whether the state has a supermajority requirement for a tax increase in that year, and they use two indicator variables for whether the state has a binding or non-binding taxes or expenditure limitations in the state in that year. They find that the interacted dummy for the line-item veto with divided government is negatively correlated with taxes per capita.

Our model also predicts a clear discontinuity in the tax level at the point in which the Governor's party gains 50% of the seats in the Legislature. de Magalhães and Ferrero (2011) implement a regression discontinuity design using a similar data set to the one used here. For these states with the line-item veto, when comparing aligned governments with divided governments, de Magalhães and Ferrero (2011) estimate a significant jump in the tax level. Taxes increase as government become aligned. In states with the block veto de Magalhães and Ferrero (2011) find no significant jump in the tax level.

[19] The line-item veto in their sample is time invariant except in four states: Iowa, Washington, Virginia, and Maine. Maine adopted the line-item veto in 1995, and the remaining three states adopted it in 1969.

2.2 Data

Our data set comprises the American states from 1960 to 2006. [20] 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.[21] In section 2.5, we look at the states in which the 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. [22]

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

[20] 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)

[21] 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.

[22] 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.

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 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.

2.3 Empirical model

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.

Since there are two chambers in each state[23] a government is defined 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.[24]

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 interpre-

[23] With the exception of Nebraska.

[24] 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.

tation.

For simplification purposes, we omit any other institutional features that may affect the tax level from our theoretical model. Two important examples of this are supermajority requirements for a tax increase, and statutory limitations on the growth of expenditure levels. These make it harder for a given legislative majority to increase either the tax rate or expenditure levels. We note, however, that taxes are progressive. And that as the economy grows, taxes over GDP also tend to grow. We also note that a decrease in the tax level does not require a supermajority. The default position is for small increases in the tax level for every year in which the economy grows. This is true even without an outright vote for a tax increase. The way in which a government chooses to respond to these natural changes in the tax level may yield enough variation for us to test our model's predictions. In order to control for the effects of these institutional features, we add a dummy variable for the observations in which a supermajority requirement was in place. We add another dummy if expenditure limitations were in place. We also show results in which the observations with a supermajority requirement are excluded.[25]

As in Besley and Case (2003) 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 two indicator variables for whether the state has a binding or non-binding taxes or expenditure limitations in that year. We also choose to include additional controls. 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:

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

[25] For an analysis of their adoption and the effect on the tax level, see Knight (2000)

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.

2.4 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. In the Appendix, Tables 4 to 7 we perform a series of robustness checks. [26]

The problem 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). The non-linear part is estimated non-parametrically,[27] so that we do not impose any restrictions on its actual shape. 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

[26] In Table 4 in the Appendix we show the results for the estimation without any controls, with state and year dummies only, and with the same controls as in Besley and Case (2003). From the estimated coefficients we can see that the shape and the discontinuity are robust to the different specifications. In Table 5 in the Appendix we also show that the results are robust to the exclusion of the observations in which a supermajority requirement for a tax increase is in place. Also in Table 5 we show that the results are robust to the exclusion of the souther states. In Table 6 in the Appendix we show results for the alternative dependent variables: taxes per capita and expenditure/GDP. The estimated shapes and discontinuity are similar to the results in Table 1. The discontinuity in the estimation with expenditures/GDP is not significant - even though it is not far from a 10% significance level. As we mentioned in section 2.2 only about half of the state expenditures are financed by revenue under the Legislature's control.

[27] 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.

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)***
$right(1 \text{ if } Gov.\ strength > 50)$	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. 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%. 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.

such as geographical dummies.

We estimate the model following the method described by Robinson (1988). 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. In particular, we use a local-linear regression and a triangular kernel[28]. 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.

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 $h = 15$ [29] implies

[28]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,

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

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

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

[29]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

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.

2.5 Governor's strength and the tax level

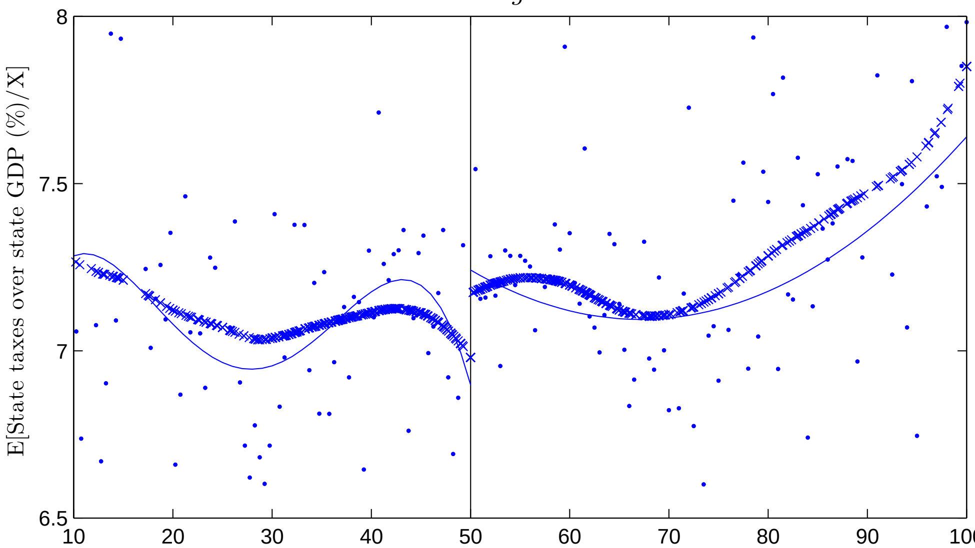
The results of both estimation procedures can be seen in Figure 5.[30] The solid line plots the function estimated with the power series and the crosses are the point estimates of the semiparametric procedure. The dots are the local averages from the semiparametric procedure.

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 Appendix, section B, we extend our theoretical model to account for the whole support. In the main text we focus our discussion on the shapes in the interval we analyzed in section 1: $(33.\overline{3}, 66.\overline{6})$.

function is allowed to be discontinuous. Their method yields a bandwidth of 15 when applied to the tax level and *Governor's strength*.

[30] 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. In the estimated power series represented in the Figures we have, the estimates with and without trimming are virtually identical.

Figure 5: 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}
· 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. This is a similar result to what Besley and Case (2003) find using an indicator variable for divided government interacted with an indicator variable for the line-item veto.

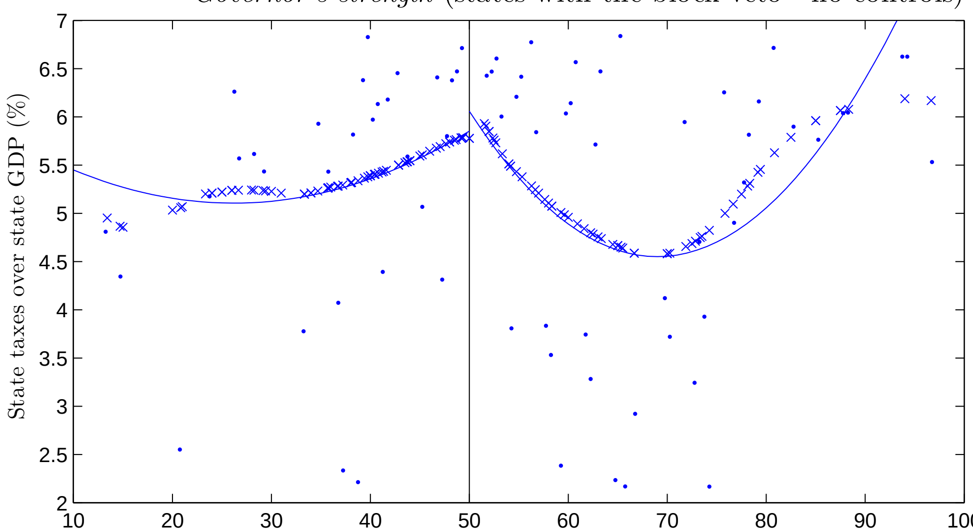
Note that as we move away from the 50% cutoff either to the left or to the right, the semiparametric estimates show taxes first rising and then falling, before picking up again in the intervals $(66.\overline{6}, 100)$ and $(0, 33.\overline{3})$. The power series estimates are similar to the left of 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. In Figure A1 in the Appendix, we show the estimates for the slope coefficients in Figure 5 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.

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.

2.6 Empirical test for the states with the block veto

Figure 6: Non-parametric estimation between the state tax level and *Governor's strength* (states with the block veto - no controls)



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

In Figure 6, we look at the relationship between the tax level and *Governor's strength* for the states with the block veto without including any controls. The non-parametric and power-series estimates are very similar. In the interval $(0, 66.\overline{6})$, the estimated function resembles the predicted shape by our model. The shape of the function is not robust to the inclusion of controls and state and year dummies, however. These results can be seen in Figure A2 in the Appendix. We have included state and year dummies and the same controls as in Figure 5. The only feature that seems to be robust in the sample of states with the block veto is the lack of a significant discontinuity in the tax level at the 50% cutoff. In Table 4 in the Appendix we present the estimates of the discontinuity in both models[31].

Overall, Figures 6, and A2 suggest that different mechanisms are at work in the states with the block veto. Our model and the estimation results in Figure 6 suggest that the Legislature is the key player in these states, but, again, the empirical results are not robust.

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. 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 they 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.

Our intention has been to adapt two important insights regarding the role of

[31]There are two few states in the block-veto sample (nine) for the standard errors to be clustered by state. In table 4 we present heteroskedastic robust standard errors.

the separation of powers on the size of government to a setting where they could be directly tested. One insight comes from Persson et al. (2000), that the tax level should be lower if the agent who can set taxes is not the residual claimant of a tax increase. The other insight comes from Grossman and Helpman (2008) who show that the degree of overlap between the two branches of government should have an effect on the budget. By adapting these insights to the institutional setup of the U.S. states we were able to test the predictions of the issuing model in a setting where we can address the critique by Acemoglu (2005): that we must find a way to unbundle institutions in order to estimate their effect. In this paper, we have shown that the institution we were interested in: the *budgetary* separation of powers, is either effective or not depending on the political configuration at a given point in time. We were able therefore check its effectiveness looking for a within state effect, that is, controlling for the bundle of institutions that define a state as a state fixed effect.

The analysis of the role of particular institutions within the American states is a promising avenue to address Acemoglu's critique. The states share all federal institutions. They also share financial, contracting, and property rights institutions. The institutional bundles in the American states are relatively more homogeneous than between countries.

Our results also lends support to the literature that has focused on the role of divided governments and the line-item veto on the tax level such as Holtz-Eakin (1988), Alt and Lowry (1994), Poterba (1994), and Besley and Case (2003). Our contribution to this mostly empirical literature is to look at the non-linearities in the relationship between political control and the tax level.

Our model gives a rationale for two interesting features of the data: (i) the tax level rises (in the interval $(44, 50)$) as the size of the opposing majority increases in the Legislature; (ii) the tax level decreases (in the interval $(55, 67)$) as the size of the aligned majority increases in the Legislature. In the model, for a Governor with a given support among the districts, when the size of the majority increases so does the overlap between the districts in the legislative majority (whether opposing or aligned) and the districts in the Governor's support. Taxes increase up to the point where the size of the majority becomes greater than the size of the Governor's support. At this point the majority internalizes the cost of taxation to a greater extend than the Governor and may prefers a lower tax level than the Governor. If this is the case, there is nothing for the Governor to veto.

Party identity still plays a part in our separation-of-powers model, but it is orthogonal to the choice of the tax level. The choice of different types of expenditure may be partisan, but according to our model, the size of government does not need to be.

A Robustness checks

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

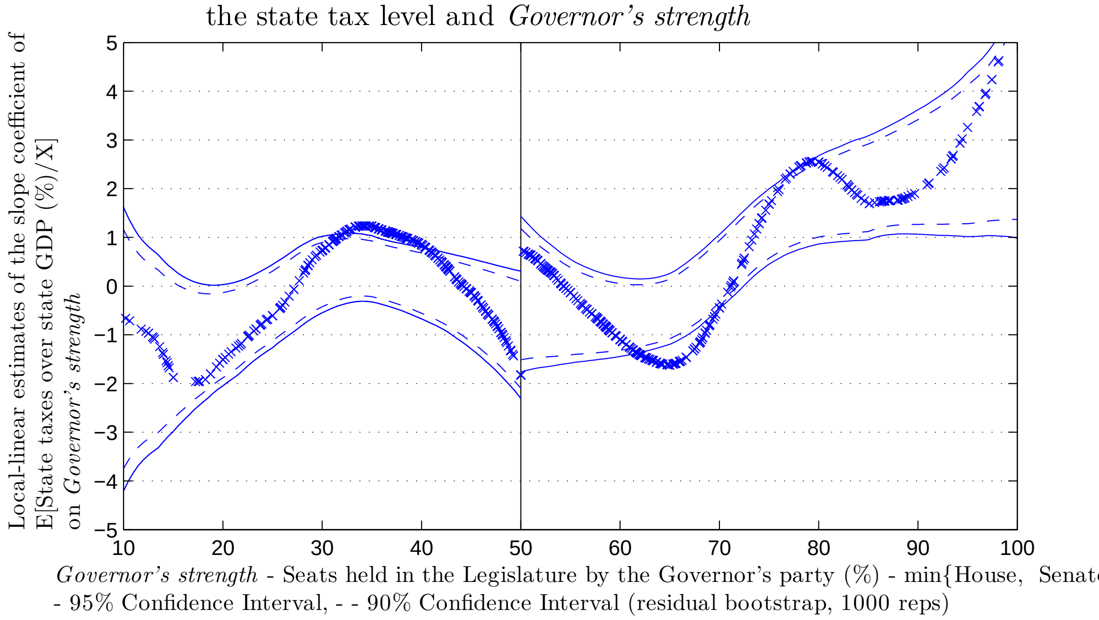


Table 4: Dependent Variable: *taxes_GDP*

	(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%. In column (1) there are no controls. In column (2) we include state and year dummies. In column (3) we add the following controls: state population, state income per capita, percentage of aged, percentage of kids, an indicator variable for whether the state has a supermajority requirement for a tax increase in that year, and two indicator variables for whether the state has a binding or non-binding taxes or expenditure limitations in that year. In column (4) we include all the previous controls but exclude the 240 observations in which a supermajority requirement for a tax increase is in place.

Table 5: 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 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. The sample in column (2) comprises 1284 observations of states with the line-item veto, an override requirement of two-thirds, and which do not require a supermajority requirement for a tax increase 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 per capita in 1981 dollars. 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 (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.

Table 6: 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

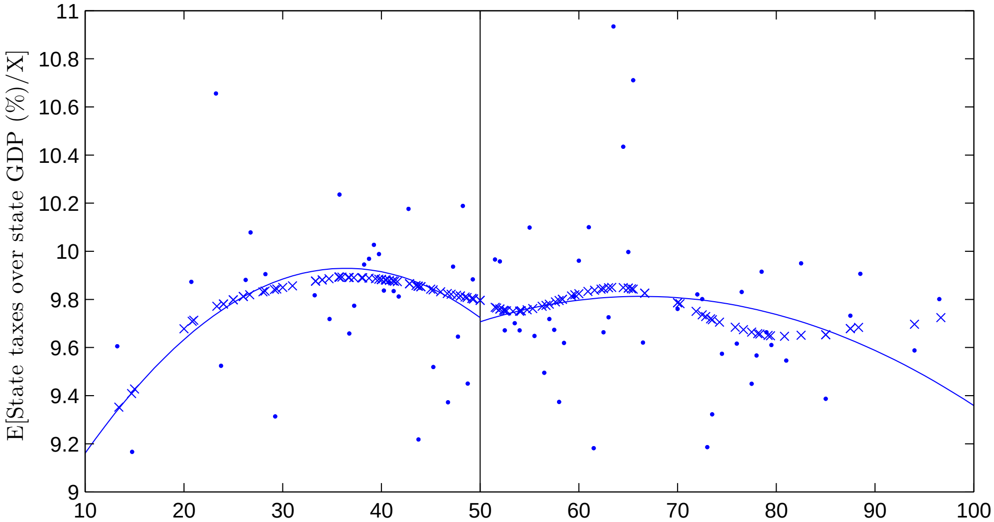
Note: The sample in column (1) comprises 1524 observations of states with the line-item veto and an override requirement of two-thirds from 1960 to 2006. The sample in column (2) comprises 1553 observations of states with the line-item veto and an override requirement of two-thirds from 1960 to 1998. Each observation represents a state within a year. 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. 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%. 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.

Table 7: 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 clustered by state (34 groups). The symbol $*$ means that the estimated coefficient is significant at 10%; $**$ significant at 5%; $***$ significant at 1%. In column (1) there are no controls. In column (2) we include the following control variables: 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.

Figure A2: Non-parametric estimation between the 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

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

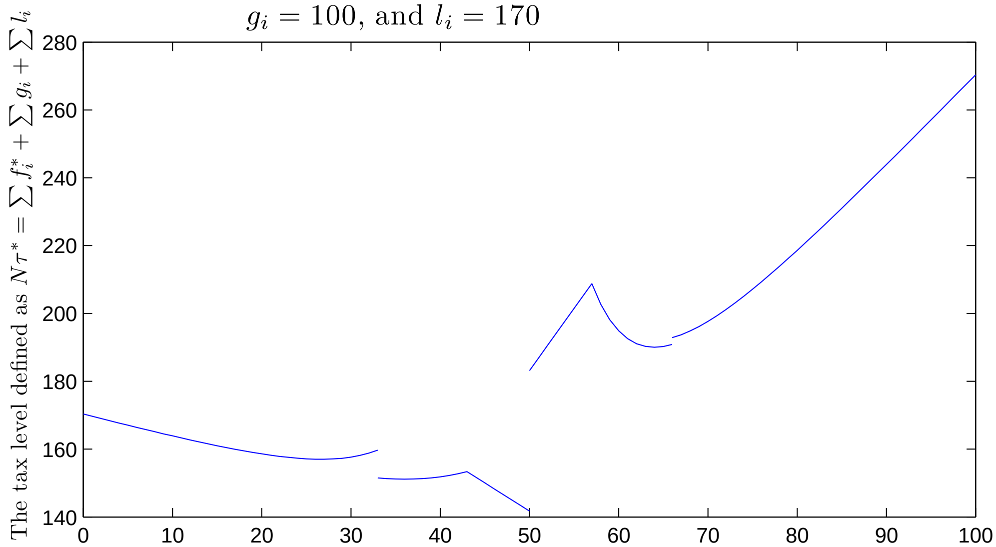
In the interval $(33.\overline{3}, 66.\overline{6})$, only the districts in the overlap between the Governor's support and the legislative majority receive positive transfers. In the intervals outside, since the veto can be overridden, all of the districts in the legislative majority receive a positive 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.

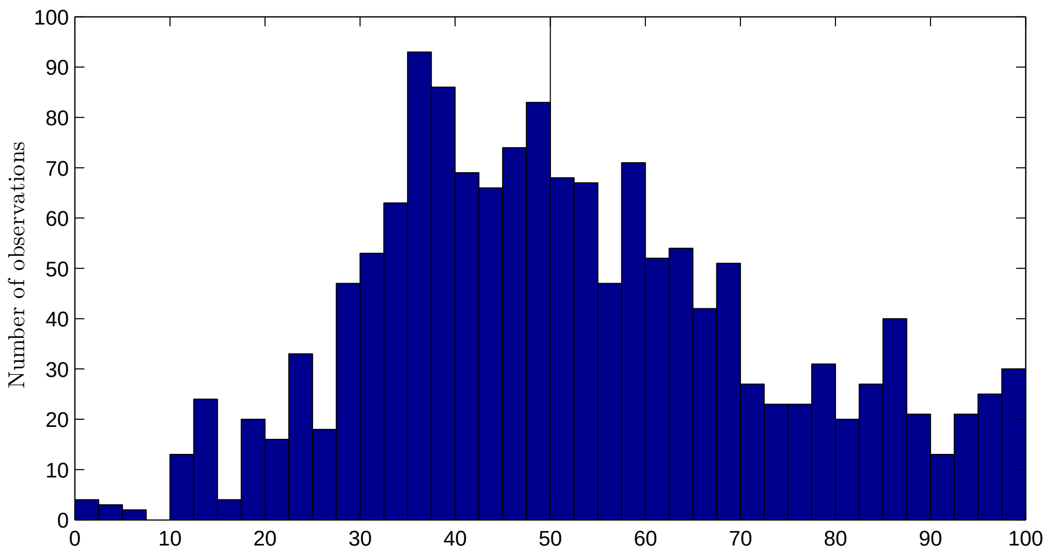
This model predicts discontinuities at $(33.\overline{3})$ and $(66.\overline{6})$. Even if we allow for them in the estimation, they are not statistically significant. This may be due to a failure of our model to explain the transition from where the veto sticks to the where it does not. It may also 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.

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



n_l - percentage of districts from the Left in the Legislature
($n_g = 57$ - the Governor is from the Left with a support of 57% of the districts)

Figure B2: Histogram of *Governor's Strength*



Governor's strength: seats held in the Legislature by the Governor's party (%) - min{House, Senate}

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