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Separation of Powers and the Tax Level in the U.S. States

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We estimate a nonlinear and discontinuous relationship between the tax level and the degree of alignment between the legislature and the governor, measured as the number of seats in the legislature that belong to the governor's party. In the states with the line-item veto, the tax level jumps at the point where the government switches from divided to unified. With a regression discontinuity design, we show that this jump can be interpreted as a causal effect. We propose a simple model to account for this nonlinear relationship. The sequential nature of the budget bargaining game, that is, the legislature proposes and the governor cuts with the line-item veto, implies that the tax level is determined by the overlap between the supporters of the governor and the supporters of the legislative majority. Changes in the size of the overlap determine the tax level.

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

1. Introduction

Spatial models with veto players have been extensively used to study the role of the separation of powers on policy. In this literature, the testable predictions focus mostly on how the policy change takes place: whether it is deliberate or automatic; large or small; or the speed of change (Tsebelis 2002). In particular, the spatial model does not provide us with a clear prediction of whether the separation of powers and different types of veto power should increase or decrease the size of government. If a player's bliss point implies a high tax level, then the veto allows this player to increase the tax level; if the player's bliss point implies a low tax level, taxes decrease. The literature that has studied the line-item veto (Holtz-Eakin 1988; Carter and Schap 1990; Dearden and Husted 1993) models the line-item veto as a stronger form of veto power than the block veto. The prediction of these articles is that the line-item veto allows the governor to achieve an outcome closer to her bliss point than she would be able to with the block veto. No clear prediction regarding the tax level arises, because the bliss point is unobserved by the researcher.

Persson, Roland, and Tabellini (2000) make very clear predictions on how the institutional separation of powers affects the tax level. The model assumes, as we do in this article, that each

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agent tries to implement the level of transfers that maximizes the utility of their own constituency. Persson, Roland, and Tabellini (2000) rely on a particular form of separation of powers: one agent proposes the tax level and then another agent proposes the allocation. They also rely on a clear separation between constituencies: each agent represents a different group of voters with no overlap. The prediction of their model is categorical: taxes should be lower with this form of separation of powers than in a model with no separation. The drawback of this model is that it lacks the rich and variable predictions allowed by the spatial models on how the ideological distance between veto players affects policy.

The main contribution of this article is to bring these two strands of the literature together. To do this, we focus on the institutional setup of the American states and on the political conflict over the amount of transfers (pork-barrel) each district receives.[1] Our focus on the pork-barrel component of the budget allows us to separate ideology from the tax level. Ideology and party identity play an important role in defining the notion of ideological location in the model, but we make the simplifying assumption that ideological preferences are orthogonal to the preferred level of transfers and to the tax level.[2]

The distance between the two players in our model, the legislative and the executive branches, will not be defined in the usual ideological space. The only ideological restriction is that the districts that voted for the *D* party will be located to the left of districts that voted for the *R* party. The distance between the two players, or their degree of alignment, is defined by the number of districts (voters) that support both the sitting governor and the majority in the legislature. The larger the number of this type of district, the higher the degree of alignment between the governor and the legislature. The model predicts that the tax level varies with this distance. Note that this setup allows for a high degree of alignment between a governor and a legislative majority from different parties as long as a high proportion of districts have split their vote.

The sequential nature of the budget process in the American states (the legislature is the deciding body on both the tax level and the allocation of resources, and the governor is only allowed to veto the budget), generates testable predictions on the tax level that do not require differential political preferences among the veto players regarding the tax level.[3] The model predicts a nonlinear relationship between the tax level and the degree of alignment between the governor and the state legislature. The predicted shape of the relationship differs between states where the governor has the block veto or the line-item veto. In particular, the model predicts an increase in the tax level as the government moves from divided to unified but only in the state with the line-item veto. In the states with the block veto, the tax level is predicted to be continuous at this cutoff.

The line-item veto is a key feature of our model and it is widespread throughout the U.S. states; it allows the governor to veto particular items and words or to trim values within the

[1] In this sense, our model builds on the literature on pork-barrel politics; see, for example, Lindbeck and Weibull (1987), Cox and McCubbins (1986), Myerson (1993), Dixti and Londgren (1995), Dixti and Londgren (1998).

[2] The intuition for this assumption is that ideology may determine how the money is spent, but every district prefers more transfers to themselves to less for a given level of taxation. And every district would rather not pay taxes if the that district is to receive zero transfers.

[3] A series of articles find little or no evidence that the party identity of the governor affects the tax level: Besley and Case (2003), Reed (2006), Leigh (2008), and Warren, Fredriksson, and Wang (2013). Ferreira and Gyourko (2009) and Gerber and Hopkins (2011) find no evidence that the partisan identity of United States mayors affects the tax level.

budget. In a minority of states, the governor has block veto power. The block veto is a similar veto power to that of the United States president: the executive branch cannot selectively veto pieces of legislation but instead must veto all of it. In our model, the line-item veto allows the governor to prevent the legislative majority from being the full residual claimant of a tax increase, which implies a lower tax level in equilibrium. This is a similar mechanism to the one suggested in Persson, Roland, and Tabellini (2000). A contribution of the article is to show that this mechanism works with the institutional setup found in most U.S. states, and that it is not limited to the stylized institutional setting of Persson, Roland, and Tabellini (2000). Moreover, the notion of distance we introduce in this context allows for the tax level to vary with the degree of alignment between the governor and the legislature.

Finally, this article makes an empirical contribution to two strands of the literature. One strand has looked at the effect of the line-item veto on the tax level and the other has focused on the effects of divided government. On the line-item veto, Abrams and Dougan (1986), Holtz-Eakin (1988), Alm and Evers (1991), Dearden and Husted (1993), Besley and Case (2003), and de Figueiredo (2003) have found little evidence for it being effective in reducing the size of government.[4] In contrast, our regression discontinuity design finds that a divided government in a state with the line-item veto effectively reduces the tax level.[5]

The empirical literature that has looked on how unified versus divided government affects the tax level has treated these variables as categorical, that is, either divided or unified (see Alt and Lowry 1994; Poterba 1994; Bohn and Inman 1996; Besley and Case 2003). Our contribution is to allow the degree of alignment to vary with the number of seats in the legislature that belong to the governor's party and to use a regression discontinuity design to infer the causal effect of a divided government on the tax level. For the empirical counterpart of our model, we define the degree of alignment as the minimum between the two legislative chambers, as to approve the budget a simple majority is required in both the House and the Senate. We call this variable Governor's strength. As Governor's strength crosses the 50% mark the government becomes unified; below the 50% mark the government is divided.[6] The evidence we find suggests that the relationship between Governor's strength and the tax level is nonlinear and discontinuous at the 50% mark for states with the line-item veto, whereas the relationship is found to be continuous for states with the block veto.

The structure of this article is as follows. In section 2, we present the model. In section 3, we estimate with a partially linear model (PLM) the nonlinear and discontinuous function between Governor's strength and the tax level and show that the jump at the 50% mark (the point at which the government switches from divided to unified) is valid as a regression discontinuity design. In section 4, we conclude.

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[4] So far this literature has attempted to deal with endogeneity using fixed effect estimators.

[5] McCarty and Poole (1995) look at the role of the block veto power yielded by the United States president. Alemán and Schwartz (2006) have looked at the effect of the line-item veto in Latin American and Tsebelis and Rizova (2007) in former communist countries.

[6] For the main intuition of the model, only one chamber is necessary. Empirically, the alternative definition would be to classify a government as unified as long as one chamber is aligned with the governor. In the supplementary material, we show that there is no jump in the tax level as we move from divided to unified government with this alternative definition. Our results suggest that both chambers must be aligned for there to be a discernible effect on the tax level at the cutoff.

2. Model

Setup

We present a model based on the formal features of the budget process in the U.S. states. The budgetary outcome is determined in a sequential bargaining game between two players. First, the legislature approves a budget bill.[7] Second, the governor decides whether to exercise veto power.[8] There are two possible types of veto power that we define in detail below: line-item veto and block veto.

There are two parties: *D* and *R*. We assume that parties are organizations that provide party members with a commitment device for logrolling within the legislature. As in Grossman and Helpman (2008), the legislative majority party maximizes the sum of the utilities of every district in the majority's group, denoted by the set *L*. Likewise, the winning governor maximizes the sum of utilities of all districts that supported her, denoted by the set *G*.[9]

Consider a representative state with a continuum of districts on the interval $[0, 1]$. A generic district x in the state is populated by a mass one of identical agents with preferences over budget outcomes given by the utility function:

$$\upsilon_{(x)} = \tilde{y} - \tau + V\left(f_{(x)}\right), \tag{1}$$

where $f_{(x)}$ is a district specific program and $V(\cdot)$ is a continuous, twice differentiable, increasing, strictly concave function, implying decreasing marginal net benefits of spending programs.[10] The lump sum tax τ is the same for each district. Each district has a net endowment $\tilde{y} = y + H(\bar{g}) - \tau^g$, where $\bar{g}$ is general per capita spending. $H(\bar{g}) - \tau^g > 0$ is the net per capita benefit and $\tau^g = \bar{g}$ is the level of taxation that funds these general items. We assume $\tau^g = \bar{g}$ to be exogenously given, and that $H(\bar{g}) - \tau^g > V^{-1}\left(\frac{1}{2}\right)$.[11] Spending $\bar{g}$ captures two aspects of the budget that we do not model explicitly: budget inertia and the costs of a government shut-down when the block veto is used. In the data, the tax level measured as a percentage of state Gross Domestic Product (GDP) does not change much over the time period we study.[12] This is mostly due to the substantial amount of the

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[7] 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. See the National Association of State Budget Offices (NASBO) publication "Budget Process in the States" at http://www.nasbo.org.

[8] In most states, the legislature may override the veto with a qualified majority. For simplicity, we ignore the veto override. This is consistent with the empirical strategy of focusing on slim majorities. In the supplementary material, we extend the model and allow the override to deactivate the veto power once the legislative majority reaches the required threshold.

[9] In contrast to Grossman and Helpman (2008), our model assigns an important role to parties in the determination of this overlap and on how the ideological space is defined; and our model describes the budget as a sequential bargaining game. Grossman and Helpman (2008) focus, instead, on how the legislative branch is willing to delegate discretionary power to the executive.

[10] We build our model on the lines of Persson, Roland, and Tabellini (2000), with targetable transfers to single-member districts. The model's results regarding the behavior of the tax level around the cutoff do not rely on transfers being targetable to specific groups. In the supplementary material, we show that the results are robust to a specification with two state-wide general items, each of which is preferred by one of the two parties.

[11] The intuition for this assumption is that the net benefit of the general type of spending $\bar{g}$, which we have in mind to be schools, police, hospitals, road maintenance, and so forth, are high enough relative to the benefit from transfers $f_{(x)}$.

[12] See Table 1.

revenues being precommitted to particular expenditures.[13] Within our model, the levels of $f_{(x)}$ are an addition to this fixed level of the state-wide general expenditures.[14]
The budget must be balanced both at the proposal stage and after the veto:

$$f = \int_{x=0}^{1} f_{(x)} dx \leq \tau.$$

Formally, the legislative majority chooses the amount of transfers for each district $f_{(x)}$, and overall taxation τ, by solving the following maximization problem:

$$\max_{f_{(x)},\tau} \int_{x \in L} \upsilon_{(x)} dx, \quad \text{subject to} \int_{x} f_{(x)} dx \leq \tau. \tag{2}$$

Under the line-item veto, the governor may only cut or trim the transfers $f_{(x)}$ chosen by the legislative majority and, therefore, solves the following maximization problem[15]:

$$\max_{f_{(x)},\tau} \int_{x \in G} \upsilon_{(x)} dx, \quad \text{subject to} \int_{x} f_{(x)} dx \leq \tau \text{ and } f_{(x)} \leq f_{(x)L} \ \forall x, \tag{3}$$

where $f_{(x)L}$ denotes the level of transfers to a given district x approved by the legislative majority.
Under the block veto, the governor chooses between the budget proposed by the legislative majority and a government shut-down, that is, $\tau = f = \tau^g = \bar{g} = 0$.[16]

We take the electoral outcome as given and study the implied tax level for all possible resulting political configurations. The political configuration can be represented on a [0,1] line as follows.[17] There is a continuum of districts on the interval $[0, 1]$. Assume that the governor belongs to party *D*.[18] We stack from left to right all districts that have voted for the governor from party *D*; this interval is the set *G* and its size is denoted by $s_G \geq 0.5$. Let s_G also denote the rightmost district that has voted for party *D*, so that the interval can be represented as $[0, s_G]$. Likewise *L* denotes the set of districts that support the legislative majority and $s_L \geq 0.5$ denotes its size. If the legislative majority belongs to party *D*, s_L is the size of the interval $[0, s_L]$, where $s_L \geq 0.5$ is also the

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[13] Specifically, incremental budgeting is the traditional budgeting method whereby the budget is prepared by taking the current period's budget or actual performance as a base, with incremental amounts then being added for the new budget period.

[14] We model the budget with one line-item for each district. This is for simplicity. Districts may also be interpreted as lobbies, unions, churches, or other pressure groups. Transfers *f* can more generally be interpreted as budget lines that cross over some districts or groups. The careful vetoing of some of these lines has the effect of cutting or trimming the transfers to a specific group of these districts. The interpretation of these groups as geographic districts is necessary for mapping the model to the data in section 3.

[15] We assume the governor cannot trim the general expenditure $\bar{g}$. This assumption is for simplicity. Allowing the governor to trim *g* would complicate the results without qualitatively changing them.

[16] In practice, during a shutdown, government employees stay at home and all government-provided services stop, except for those within essential areas. See NCSL document "Procedures When the Appropriations Act is Not Passed by the Beginning of the Fiscal Year": http://ncsl.org. For a detailed description of federal government shutdowns see Meyers (1997). 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.

[17] The representation of the ideological space in one dimension implies that there can only be one type of vote splitting in equilibrium (see Alesina and Rosenthal 1996). This is in line with our representation of branches' interest overlap below.

[18] This is without loss of generality as the labels can be switched around.

rightmost district that voted for party *D*. Whereas, if the legislative majority belongs to party *R*, s_L is the size of the interval $[1-s_L, 1]$, where $1-s_L \leq 0.5$ is the leftmost district that voted for party *R*. If there is a unified government the overlap between *G* and *L* is the interval $[0, \min\{s_G, s_L\}]$ and its size is given by $\min\{s_G, s_L\}$. If there is a divided government the overlap between *G* and *L* is the interval $[1-s_L, s_G]$ and its size is given by $s_G-(1-s_L)$.[19]

Summarizing, the timing of the game is as follows: (i) the exogenous election outcome determines the government configuration, which is fully observed by all players; (ii) the legislature approves the budget bill and its implied tax level by simple majority; and (iii) the governor may veto the budget or cut programs according to the type of veto power available, line-item or block veto.

Results

Lemma 1. In the states with the line-item veto, only the districts that are both part of the legislative majority and part of the governor's support receive positive transfers $f_{(x)} > 0$ in equilibrium. We call these districts the overlapping districts.

We focus on the intuition, and leave the formal proof to the supplementary material. At the last stage, the governor vetoes to zero any proposed transfers $f_{(x)L}$ to districts not in her support. Any positive transfers to these districts entail a higher tax level with no marginal benefit to the districts in her support. The governor cuts to zero all $f_{(x)L}$ when $x \notin G$; and trims part of $f_{(x)L}$ for $x \in G$ if its level is considered excessive.

At the first stage of the bargaining, the legislative majority will not assign positive transfers $f_{(x)L} > 0$ to districts not in the legislative majority. These would only entail a cost in the form of additional taxes.

Lemma 2. For $\frac{1}{2} < s_G < 1$, the size of the overlapping set of districts displays a discontinuity as the government configuration switches from a divided to a unified government.

Again, we focus on the intuition here and leave the proof to the supplementary material. Let us keep the assumption that the governor belongs to party *D*. Under a divided government party *R* holds the majority in the legislature. The size of the overlap is given by the fraction of the districts in *G* that support the legislative majority of party *R*. Formally, if the governor is from one party and the legislative majority is from another party, then the size of the overlap is given by $s_G-(1-s_L) > 0$. Under a unified government, the size of the overlap is given by $\min\{s_G, s_L\}$.

Within each configuration, the degree of alignment is a smooth continuous function in the share of districts in the legislative majority. However, this is not the case when the majority party switches in the legislature. Under a unified government, as s_L approaches the cutoff (from the right), the smallest possible overlap is given by $\min\{s_G, s_L\} = \frac{1}{2}$. But under a divided government, the overlap at the cutoff is arbitrarily close to $s_G - \frac{1}{2}$. The jump is given by $\Delta = 1-s_G$. The

[19] As an example assume that $s_G = 0.6$, that is, all districts from 0 to 0.6 support the *D* governor. We compare two legislative majorities, one from party *D* and one from party *R*, and both have the same size: $s_L = 0.55$. Under a unified government, all districts from 0 to 0.55 support the legislative majority from party *D* and the overlap is given by these 0.55 districts. Under a divided government, $s_L = 0.55$ implies that districts in the interval [0.45,1] support the legislative majority composed of party *R* districts; the overlap is the interval [0.45,0.6] and the size of the overlap is $s_G-(1-s_L) = 0.6-(1-0.55) = 0.15$.

discontinuity is present unless the governor has 100% of support. Only in this limit case does a switch from divided to unified government imply no change in the number of districts in the overlapping interval.

Given Lemma 1 and 2, we may now determine the equilibrium tax level.

PROPOSITION 1. If the governor has the line-item veto, for any $\frac{1}{2} \leq s_G < 1$, taxes are: (a) discontinuous at $s_L = 0.5$; under a unified government (b) strictly increasing in the interval $s_L \in \left[\frac{1}{2}, s_G\right)$, (c) strictly decreasing in the interval $s_L \in [s_G, 1]$; under a divided government (d) strictly decreasing in the interval $1-s_L \in \left(1-s_G, \frac{1}{2}\right)$; and (e) ambiguous in the interval $1-s_L \in [0, 1-s_G]$.

For the proof, see the supplementary material. To give the intuition, we start at the last stage with the governor's decision. According to Lemma 1, the governor will assign zero transfers to districts outside *G*. The governor's preferred level of transfers for each district in her support is given by $f_{(x)} = V^{-1}(s_G) = f(s_G)$ for all $x \in G$. With line-item veto power, the governor trims down legislative proposals with $f_{(x)L} > f(s_G)$.

The legislative majority assigns zero resources to districts outside *L*. The desired (maximum) expenditure proposed by *L* is given by $f_{(x)} = V^{-1}(s_L) = f(s_L)$ for all $x \in L$. As we assume the veto to be costless to exercise, the legislative majority can be considered to solve the maximization problem (Eqn. 2) without accounting for the governor's further behavior. This is a weakly dominant strategy for the legislative majority.

Note that the size of the overlap does not determine the optimal level of transfers for each district. The optimal level for both the governor and for the legislative majority is only determined by s_G and s_L, respectively. For this reason, the legislative majority can solve an unconstrained maximization and assign $f_{(x)L} = f(s_L)$ to every district in *L* and let the governor cut to zero any transfers to those districts not in the overlap (and trim those in the overlap if necessary, i.e., if $s_G > s_L$).[20] Note that $\frac{df(s_B)}{ds_B} < 0$ for $B = G, L$ implies that if $s_B < s_{B'}$ then the desired levels of transfers for districts in each support bear $f(s_{B'}) < f(s_B)$. This means that the branch with the larger constituency internalizes more the aggregate costs of taxation and will prefer a lower level of district specific transfer.

Part (a). The reason the tax level decreases as we move from a unified to a divided government has already been discussed in Lemma 2: the size of the overlapping set decreases discontinuously. Note that on both sides of the cutoff $s_L \leq s_G$. This means that the governor determines the level of transfers for each district. For a fixed s_G, the amount each district in the overlap receives on both sides of the cutoff is the same. As the size of the overlap changes discontinuously, so does the tax level.

Part (b). This refers to the interval $[0.5, s_G)$. The overlapping set has size s_L, as $s_L < s_G$ and the government is unified. Note that as $s_L < s_G$, the governor internalizes more of the cost of taxation than the legislative majority. This implies that the governor determines the level of transfers for those districts in the overlapping set. For a fixed s_G, as s_L increases so does the number of districts receiving positive transfers, which pushes taxes up.

Part (c). This refers to the interval $[s_G, 1]$. For $s_L \geq s_G$, the overlapping set is now fixed at s_G. As $s_G < s_L$, the legislative majority internalizes more of the cost of taxation and,

[20] The quasilinear form of the objective function (additively separable and linear in taxation), implies that marginal cost of taxation and the marginal benefit of $f_{(x)}$ do not interact, as is shown in the proof in the supplementary material.

therefore, sets a level of transfers that is below the governor's desired level. The governor has no need to trim positive levels of transfers assigned to the overlapping set. As s_L increases, the marginal cost of taxation for the legislative majority increases. This means that they set lower transfers $f(s_L)$. For a given size of the overlapping set, s_G, the set of beneficiaries is fixed, and the overall tax level falls with $f(s_L)$ as s_L increases.

Part (d). This refers to the interval $(1-s_G, 0.5)$. The government is divided, the legislative majority is given by the interval $[1-s_L, 1]$ and the overlap by the interval $[1-s_L, s_G]$. The larger support is given by $s_G > s_L$, which implies that the governor chooses the level of transfers in equilibrium. As s_L decreases, the size of the overlap decreases, which implies that the number of districts receiving positive transfers also decreases, but the amount each district receives is fixed and determined by the governor. This implies that the tax level is decreasing in the interval $[1-s_G, 0.5]$.

Part (e). This refers to the interval $[0, 1-s_G]$. The government is divided as in part (d). The difference is that $s_L > s_G$, which means that the legislative majority determines the level of transfers. The veto power stops having bite as a trimming mechanism for the level of transfers. Two forces are at play. The first is the same as in part (d): as s_L decreases, the size of the overlap decreases, which implies that the number of districts receiving positive transfers also decreases. This force pushes the tax level down. The second force goes in the opposite direction: as s_L decreases, the legislative majority internalizes the cost of taxation less. This implies that the legislative majority will choose a higher level of transfer for each district in L as s_L decreases. This force pushes the tax level up. If the $V(\cdot)$ function is concave enough, the second force dominates.

Proposition 2. If the governor has block veto, for any $\frac{1}{2} \leq s_G < 1$ the legislative majority determines both the set of beneficiaries and the level of transfers, and taxes are continuous at $s_L = \frac{1}{2}$.

For the proof, see the supplementary material. With the block veto, all the action is driven by s_L. To see this, first note that it is too costly for the governor to exercise a block veto. Consider the extreme case in which marginal taxation and transfers carries no benefit to G: a divided configuration with $s_G = 1/2$ and $s_L \simeq 0.5$. The tax level τ is only a cost to the governor. No one in G receives positive transfers, but they have to pay τ. If all transfers were to be trimmed down to zero, the governor's welfare would increase by $\frac{1}{2} f\left(\frac{1}{2}\right)$ as taxation would decrease by $f\left(\frac{1}{2}\right)$ for all districts in L. However, the block veto shuts down the whole budget, which implies the loss of the net benefits $H(\bar{g}) - \tau^g$ per capita and per district. The aggregate loss is then $\frac{1}{2}[H(\bar{g}) - \tau^g]$. The net benefit is negative as $H(\bar{g}) - \tau^g > V^{-1}\left(\frac{1}{2}\right)$, by assumption.

The overall level of taxation is then determined by

$$\tau^{BV} = \int_{x \in L} f_{(x)L} dx = s_L f(s_L),$$

with $s_L \in [0.5, 1]$ continuous for any party configuration. Thus, the size of the majority pins down both the set of beneficiaries and the level of transfers. Two opposite forces are at play as we add one member to the majority: the size of the majority increases, which pushes the tax level up; but any higher taxes have to be shared equally, and this force pushes the tax level down. If $V(.)$ is close to linear, the first effect dominates and the function relating the size of the majority and the tax

level takes a "V" shape on the [0,1] line, with the inflection point at $s_L=0.5$. If $V(.)$ is concave enough it takes an "inverted-V" shape.

3. Empirical Analysis

Data

Our data set comprises the American states from 1960 to 2006.[21] The majority of American states (34) give their governors line-item veto power and require a two-thirds majority in the legislature for this veto to be overridden. These states will form our restricted line-item veto sample. We also provide results for an extended line-item veto sample, in which we add states where the override requirement is 50% of the votes. Finally, we compare the results from the sample of states with line-item veto with the sample of states with block veto.[22]

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 the tax level 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. Another potential dependent variable would be transfers received by district. Unfortunately identifying district level expenditure is not easy.[23] In particular, some targeted transfers may come in the form of tax cuts or exemptions.

We do 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.

Changes in the tax rates would have been another alternative for the dependent variable. We have not followed this strategy for two reasons. First, the tax level is progressive. As the economy

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[21] 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).

[22] 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 (Iowa, Maine, Washington, West Virginia). These states enter the block veto sample up to adoption, at which point they move to the line-item veto sample. The block veto also includes the six states with the block veto throughout. These are Indiana, Nevada, New Hampshire, North Carolina, Rhode Island, and Vermont. The extended line-item veto sample includes Alabama, Arkansas, Illinois, Kentucky, and 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 a restricted line-item veto sample of 1524 observations; an extended line-item veto sample of 1712 observations; and a block veto sample of 287 observations.

[23] Some new data has been produced by Aidt and Shvets (2011). They are able to identify district level educations expenditure for seven states from 1993 to 2004. A future avenue of research is to use data on county specific transfers from the Census of Government. Ansolabehere and Snyder (2006) use this data and their results support the mechanism proposed in our model. They find that: "(i) counties that traditionally give the highest vote share to the governing party receive larger shares of state transfers to local governments; (ii) when control of the state government changes, the distribution of funds shifts in the direction of the new governing party." The reason we have not pursued this further is that we would need to identify partisan support from state electoral results for state legislators organized by county, and this data does not seem readily available. Ansolabehere and Snyder (2006) identify partisan support at the county level using federal and gubernatorial elections.

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.

Table 2. Political Parties and the Adoption of Income and/or Corporate Taxes

State and Year	Majority in the House	Majority in the Senate	Governor
States with line-item veto			
Connecticut (1970)	Democrat	Democrat	Democrat
Florida (1972)	Democrat	Democrat	Democrat
Illinois (1970)	Republican	Republican	Republican
Michigan (1968)	Republican	Republican	Republican
New Jersey (1962)	Democrat	Republican	Democrat
Ohio (1972)	Republican	Republican	Democrat
Pennsylvania (1971)	Democrat	Democrat	Democrat
States with block veto			
Indiana (1964)	Republican	Republican	Democrat
Maine (1970)	Republican	Republican	Democrat
Rhode Island (1970)	Democrat	Democrat	Democrat
New Hampshire (1971)	Republican	Republican	Republican

Note: Our sample comprises data on corporate and income tax revenue from 1960 to 2006.

grew over the period, the tax level would have increased in the long term without any changes in the tax rates. Changes in the tax level can be achieved without the introduction of any bill if the intended changes are in line with the business cycle. Second, we have not found detailed enough data on tax rate changes.

We have found detailed information on the adoption of income and corporate taxes in the period. This can be seen in Table 2. Of the seven states with the line-item veto that adopted a new tax in the period, only Ohio had a fully divided government. New Jersey had an aligned House but a misaligned Senate. The remaining five states had a fully aligned government. This suggests that a new tax is more likely to be adopted under a fully unified government. Out of the four states with a block veto, two had a fully aligned government, and two had a fully divided government. This suggests that in the states with block veto, political alignment is not relevant in explaining the adoption of a new tax. Moreover, both in the states with the line-item veto and with the block veto the unified governments are evenly divided between Republicans and Democrats. Overall, Table 2 suggests that the adoption of new taxes during the sample period seems to be in keeping with the mechanism presented in our model and with the empirical results we describe below.

The PLM: Testing the Nonlinearities

In this section, we test the prediction made in Proposition 1. 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. Governor's strength will enter the model nonlinearly, 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.

The empirical variable Governor's strength is equivalent in our model to a variable we shall call n_l, which is defined as $s_L \times 100$ if the government is unified and $(1-s_L)\times 100$ if the government is divided. The variable n_l in the model is simply the percentage of seats in the legislature that belong to the same party as the governor.

There are two chambers in each state.[24] To estimate the nonlinear 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.[25] The alternative definition would be to classify a government as unified as long as one chamber is aligned with the governor. The degree of alignment would then be defined as the maximum between the two legislative chambers. In the supplementary material, we show that there is no jump in the tax level as we move from divided to unified government with this alternative definition. This is to be expected as a majority in both chambers is necessary to approve the budget.

In Table 1, we see that the average tax level has remained stable since the 1970s. We interpret our estimation as capturing small deviations from the mean state tax level at each year.

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 rate increase in that year[26]; and 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. Each observation is a state, denoted by s, in a year, denoted by t.

The PLM is summarized as:

$$\text{taxes\_GDP}_{st} = \beta' X + f(\text{Governor's strength}_{st}) + \ _{st},$$

[24] With the exception of Nebraska.

[25] 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. In the block veto sample, we exclude four observations with perfectly tied legislatures, results are robust but less precise otherwise.

[26] For a detailed study on the effect of supermajority requirements on the tax level, see Lee, Borcherding, and Kang (2013). Note that the supermajority requirement is for a formal tax rate increase only, not decrease. Moreover, the tax level may increase as the economy grows, as taxes are progressive. For these reasons, it is not clear whether this supermajority requirement implies a different cutoff point for our purposes. We choose to keep these observations. All results are robust to excluding them.

Table 3. State Tax Level and Governor's strength: Polynomial Estimates With and Without Controls

	Line-Item Veto		Block Veto	
	Dependent Variable: State Taxes Over State GDP (%)			
State-Year Samples	(1)	(2)	(3)	(4)
Constant	6.79	4.69	9.67	6.44
	(0.81)***	(0.41)***	(1.38)***	(0.99)***
Gov. strength×(1−right)	15.81	30.56	4.66	−10.97
	(5.24)***	(14.36)**	(2.31)*	(9.07)
Gov. strength^2×(1−right)	−138.78	−244.31	−6.14	20.94
	(45.14)***	(111.9)**	(4.53)	(15.28)
Gov. strength^3×(1−right)	409.39	694.13	–	–
	(134.39) ***	(303.9) **		
Gov. strength^4×(1−right)	−388.36	−651.2	–	–
	(128.40)***	(273.1)**		
Right	2.58	27.53	−0.85	17.99
(1 if Gov. strength > 50)	(1.14)**	(14.4)*	(2.84)	(7.70)**
Gov. strength×(right)	−6.82	−115.2	5.04	−57.64
	(3.12)**	(60.6)*	(8.17)	(25.59)*
Gov. strength^2×(right)	5.09 (2.20)**	160.2	−3.86	41.77
		(83.6)*	(5.66)	(19.13)*
Gov. strength^3×(right)	–+	−72.08	–	–
		(38.0)*		
Discontinuity at	0.33 (0.16)**	0.69	−0.09	−0.14
Gov. strength=50		(0.39)*	(0.14)	(0.50)
Controls	State and Year Dummies and additional controls	No controls	State and Year Dummies and additional controls	No controls
R-squared	0.84	0.02	0.93	0.11
Number of observations	1524	1524	287	287

Note: The sample for columns 1 and 2 comprises 1524 state-years from 1960 to 2006 with the line-item veto and an override requirement of two-thirds. The sample for columns 3 and 4 comprises the sample of state-years with the block veto. 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 in column 1; 9 groups in column 2). The additional control variables in the above regression are: state population, state income per capita, and indicator variables 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.
*Significance at the 10% level.
**Significance at the 5% level.
***Significance at the 1% level.

where all of the control variables mentioned in the above paragraph enter linearly in X together with state and year dummies. The relationship between Governor's strength and the tax level is allowed to have a unspecified shape (restricted to be continuous except for the 50% cutoff). We discuss below whether the discontinuity we estimate is valid as a regression discontinuity design.

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. To determine the degree of each series, we stopped

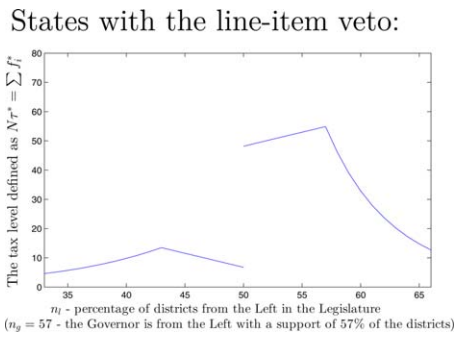

Figure 1. Model Prediction with $V(f)=f^{\frac{9}{10}}$

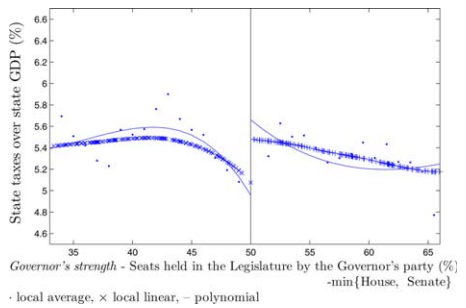

Figure 2. RDD Nonparametric—poly. (4-3)

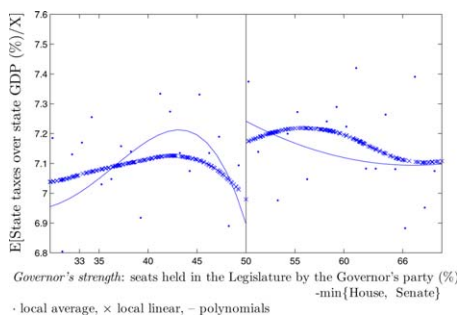

Figure 3. PLM Semiparametric—poly. (4-2)

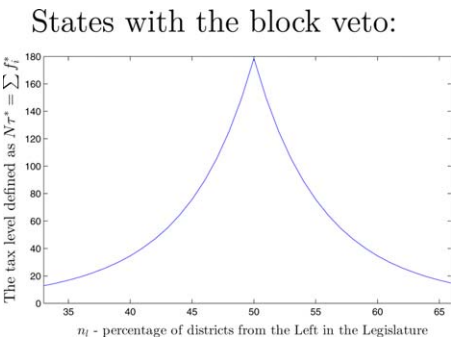

Figure 4. Model Prediction with $V(f)=f^{\frac{9}{10}}$

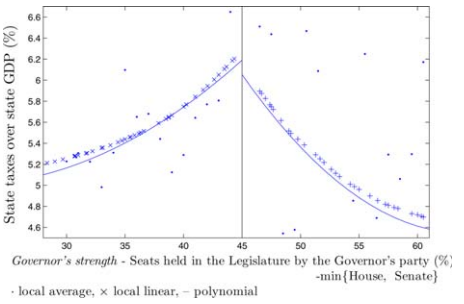

Figure 5. RDD Nonparametric—poly. (2-2)

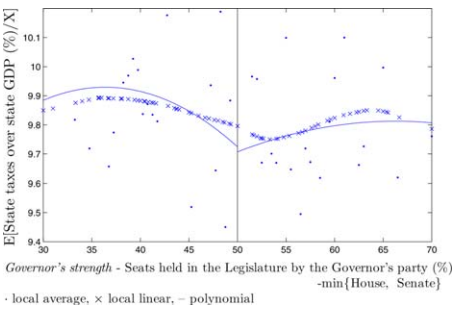

Figure 6. PLM Semiparametric—poly. (2-2)

adding terms when the extra term was not precisely estimated. For the line-item veto sample, this procedure yields a quartic polynomial to the left of the 50% cutoff and a quadratic polynomial to the right. For the block veto sample, this procedures yields a quadratic polynomial to the right of the cutoff and no precise estimate to the left of the cutoff (we, therefore, use a quadratic polynomial also on the left of the cutoff).[27]

The result of this procedure can be seen in Table 3. In column 1, we can see the results for the line-item veto and in column 3 for the block veto. To estimate the size of the discontinuity and its

[27] In the supplementary material, we show that the shape is not precisely estimated if we use higher order polynomial on either side of the cutoff.

standard error, it is useful to normalize the function to take the value 0 at Governor's strength = 50%. The estimate of the jump is at the bottom of Table 3 for each column. The results show a statistically significant increase in the tax level in the order of 7% at the 50% cutoff in the sample of states with the line-item veto. In the sample of states with the block veto, the point estimate indicates a decrease of less than 2%, which is not statistically different from zero. These results are in line with the predictions of our model.

In Table 3, column 2, we can see that the shape of the relationship between Governor's strength and the state tax level is similar in an estimation without any controls or state and years fixed effects.[28] In column 4, we can see that the shape of the relationship in the block veto sample is not robust to an estimation without control variables and state and year fixed effects. However, the estimated discontinuity remains small and not statistically different from zero.

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). The linear part of the model is estimated as in any linear model. The nonlinear part is estimated nonparametrically, so that we do not impose any restrictions on its actual shape. We use a local-linear regression (LLR) with a triangular kernel and the optimal bandwidth suggested by Imbens and Kalyararaman (2009).

In Figure 1 we have plotted the results of our theoretical model to that it can be compared with the empirical estimates. For the line-item veto sample, the results of both the power-series estimation in Table 3, column 1, and the semiparametric procedure can be seen in Figure 3.[29] 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. In Figure 2, we plot the results of the power-series estimator without any controls presented in Table 3, column 2, and the results of a nonparametric estimate using a LLR with a triangular kernel and the optimal bandwidth suggested in Imbens and Kalyararaman (2009). For the block veto sample, the parallel results can be seen in Figures 5 and 6.

In Figure 1, we have plotted the results of our theoretical model for the states with the line-item veto for a particular utility function $V(f)=f^{\frac{9}{10}}$ and a particular governor's support $s_G=0.57$ (or 57% of the seats). These parameters have been chosen to match the shapes of the semiparametric estimates for the line-item veto sample in Figure 3. Both the power-series and the semi/nonparametric estimates in Figures 3 and 2 lend support to the main features of our model. First, the estimates reveal a discontinuity in the tax level. Second, there is a negative relationship between the tax level and Governor's strength to the immediate left of the cutoff. To the right of the cutoff the relationship between the tax level and Governor's strength depends on the estimation method. The semiparametric methods indicates a concave function and the power-series estimators suggest

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[28] We have performed a series of robustness checks that are available in the supplementary material. The shape and discontinuity of the function are robust to being estimated 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.

[29] If the density of Governor's strength 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 Governor's strength. 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, but we have for Figure 3. The estimates with and without trimming are virtually identical.

a decreasing function. The concave function is rationalizable in our model with the parameter $s_G >> 0.5$ and the decreasing function by a s_G approaching 0.5. A robust feature of the data seems to be that the tax level increases in a divided government as the opposing legislative majority increases around the cutoff (toward the left), that is, as the government becomes "more divided." This feature supports Proposition 1.

In Figure 4, we have plotted the results of our theoretical model for the states with the block veto with the same utility function: $V(f)=f^{\frac{9}{10}}$. The feature of no discontinuity in the tax level is verified in both the partially linear estimates in Figure 6 and in the estimates with no controls in Figure 5. The shape of the function around the cutoff predicted by the model matches the empirical estimates without controls in Figure 5, but these shapes are not robust to the inclusion of state and year fixed effects and other controls. This lack of robustness may be due to small sample size. Note that our model's predictions regarding the shape of the relationship in the states with the block veto depend on the degree of concavity of $V(.)$. The only clear predictions by the model regarding the relationship is the symmetry around the inflection point ($n_l = 50$) and the lack of a discontinuity in the tax level at the 50% cutoff. Both these features are robust in the data.

Regression Discontinuity Design

Discontinuity Estimates

In this section, we show that the 50% cutoff in Figures 2, 3, 5, and 6 are valid as regression discontinuity designs (the validity is more robust for the sample of states with the line-item veto). Therefore, the jump in the tax level estimated for the states with the line-item veto has a causal interpretation and so does the lack of a jump in the states with the block veto.

In the regression discontinuity design, the forcing variable is Governor's strength. Above the 50% cutoff, the observation receives treatment. The treatment is a "unified government." At each period, a state is either assigned the treatment or not. For the observations in which the elections delivered a slim majority in either chamber, we argue that the assignment of treatment was as if it were random. The identification assumption of the regression discontinuity design is only valid at the cutoff, where the forcing variable determines whether an observation receives treatment or not. All other covariates are assumed to be continuous at the 50% cutoff. If this is the case, then the treatment status is solely determined by whether the government is divided or unified and we can read the jump in the tax level as a caused by the change in treatment status.

The identification assumptions of a regression discontinuity design are different to the assumptions necessary to estimate the shape of the relationship between the tax level and Governor's strength. For example, identification of the jump should not depend on the use of control variables. It is reassuring, therefore, that the results regarding the discontinuity for both the line-item veto and block veto states do not depend on the inclusion of control variables (see Table 3).

As in this section, we are not trying to identify the shape of the function elsewhere in the domain, the sample can be extended to all states with the line-item veto, whether or not they have a two-third override requirement. We will refer to this as the extended sample. As our focus is on the jump at the cutoff and not the effect of changes in the degree of alignment, we can also look at each chamber separately. In Table 4, we show results for regression discontinuity estimates for the line-item veto and block veto samples. We estimate the discontinuities with different polynomial degrees and using a LLR.

Table 4. State Tax Level and Regression Discontinuity Design: Jump at Governor's strength = 50%

States With the Line-Item Veto	Poly. 4-3	Poly. 3-3	Poly. 4-4	n. obs.	LLR (a)	n. obs.	LLR (b)	n. obs.
Governor's strength (sample rest.)	0.69 (0.39)*	0.38 (0.34)	0.81 (0.48)*	1524	0.40 (0.19)**	714	0.50 (0.28)*	350
Governor's strength (sample ext.)	0.63 (0.35)*	0.39 (0.30)	0.79 (0.45)*	1712	0.41 (0.17)**	858	0.48 (0.26)*	410
Governor's strength in the House	0.60 (0.30)*	0.40 (0.25)	0.69 (0.35)*	1712	0.38 (0.15)**	952	0.65 (0.21)***	484
Governor's strength in the Senate	0.34 (0.31)	0.09 (0.26)	0.11 (0.40)	1712	−0.05 (0.16)	1028	0.11 (0.22)	529
States with the Block Veto	Poly. 2-2	Poly. 3-3	Poly. 4-4	n. obs.	LLR (a)	n. obs.	LLR (b)	n. obs.
Governor's strength	−0.14 (0.50)	0.43 (0.45)	−0.32 (0.55)	287	−0.14 (0.32)	190	0.16 (0.30)	105
Governor's strength in the House	0.37 (0.21)	0.57 (0.34)	−0.51 (0.21)**	287	0.07 (0.21)	138	−0.30 (0.23)	74
Governor's strength in the Senate	−0.06 (0.63)	−0.08 (0.85)	−0.42 (1.18)	287	−0.08 (0.65)	126	1.58 (1.14)	53

Note: The line-item veto restricted sample comprises 1524 state-years from 1960 to 2006 with the line-item veto and an override requirement of two-thirds of the votes. The line-item veto extended sample comprises 1712 state-years from 1960 to 2006 with the line-item veto. The block veto sample comprises 287 state-years from 1960 to 2006. The forcing variable, Governor's strength, is the percentage of seats that belong to the same party as the governor. Governor's strength is either defined as the minimum between the House and the Senate, or as the percentage of seats in the House, or in the Senate. The discontinuity is estimated at Governor's strength = 50% with different degree polynomial on each side of the cutoff. Standard errors are clustered by state and are presented in parenthesis. The LLR are estimated with a triangular kernel and the standard errors suggested in Imbens and Kalyararaman (2009); LLR(a) uses the optimal bandwidth as by Imbens and Kalyararaman (2009), and LLR(b) uses half the optimal bandwidth.

*Significance at the 10% level.

**Significance at the 5% level.

***Significance at the 1% level.

In Table 4, rows 1 and 2, we can see that the discontinuity in the tax level is robust whether we use the restricted or the extended sample of line-item veto states. The estimates are significant as long as we allow for enough flexibility to the left of the cutoff; a quartic polynomial is required to pick up the drop in the function as it approaches the cutoff. In columns 4 and 5, we present nonparametric estimates, which consist of a LLR. LLR(a) uses the optimal bandwidth suggested by Imbens and Kalyararaman (2009) and LLR(b) uses half the optimal bandwidth. The result of a positive and significant discontinuity is robust whether we define the forcing variables as the minimum support for the governor between the House and the Senate (rows 1 and 2) or as the governor's support in the House alone (row 3). The alignment between the Senate and the governor seems to have no effect on the tax level (row 4).

In Table 4, rows 5 to 7, the results indicate no jump in the tax level at the 50% cutoff for the states with the block veto, whether we define the forcing variables as the minimum support for the governor between the House and the Senate, the House alone, or the Senate alone. The sample size is much smaller, however, and the point estimates vary considerably depending on parametric or bandwidth choices. In the case of a quartic polynomial on either side of the cutoff, the discontinuity is estimated to be negative and significant, but this result is by no means robust.

It is interesting to compare the result in Table 4, row 3, 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, at least locally at the cutoff, is determined by whether the government is divided or unified, and not by whether Democrats or Republicans are in power.

Checking the Validity of the Design

The main test of validity for a regression discontinuity design is to check if any covariate is discontinuous at the 50% cutoff. Under the identification assumption, all unobservable and observable variables should be continuous at the cutoff. In Table 5, we present balance tests for a series of covariates. Democratic governor takes value 1 if the governor is a Democrat, and value 0 otherwise. Turnout is defined as the fraction of the population that turned out to vote in the last election. Midterm election takes value 1 if the election for that observation was a midterm election, and value 0 if the governor was also chosen in that election. Population is the state population in millions for a given year. Income per capita is the state income per capita in thousands of 1982-dollars. Unemployment rate is the state unemployment rate in a year. Local property taxes is the percentage of a state average property tax in a year divided by state GDP. Supermajority requirements takes value 1 if the state in that year requires a supermajority to vote for a formal tax increase. Tax and expenditure limitations takes value 1 if the state has a tax limitation rule on that year and value 0 otherwise. The last row presents the McCrary (2008) test for a discontinuity in the density of the forcing variable.

In the case the forcing variables is the Governor's strength in the House we also check the continuity of the following variable (row 1): Governor's party control Senate, which is an indicator variable that takes value 1 if the majority in the Senate belongs to the governor's party and value 0 otherwise. The lack of a discontinuity in this variable indicates that the variation in alignment

Table 5. Balance Tests for the Validity of the Design

	States With the Line-Item Veto						States With the Block Veto					
	Governor's strength						Governor's strength					
Forcing Variables	min{House,Senate}		House		Senate		min{House,Senate}		House		Senate	
Polynonmial functions	3-3	4-4	3-3	4-4	3-3	4-4	3-3	4-4	3-3	4-4	3-3	4-4
Governor's party control Senate	–	–	−0.03 (0.11)	−0.05 (0.14)	–	–	–	–	−0.28 (0.21)	−0.45 (0.17)**	–	–
Governor's party control House	–	–	–	–	−0.06 (0.12)	0.02 (0.15)	–	–	–	–	−0.41 (0.12)***	−0.23 (0.41)
Democratic governor	−0.12 (0.13)	−0.17 (0.19)	−0.11 (0.11)	−0.22 (0.14)	−0.10 (0.13)	−0.07 (0.16)	−0.18 (0.26)	−0.29 (0.45)	−0.01 (0.15)	−0.02 (0.17)	−0.06 (0.20)	−0.12 (0.28)
Turnout	−0.01 (0.03)	−0.00 (0.03)	−0.03 (0.03)	−0.03 (0.03)	0.02 (0.02)	0.02 (0.03)	−0.11 (0.05)*	−0.08 (0.03)*	−0.07 (0.03)*	−0.05 (0.07)	−0.10 (0.10)	0.06 (0.07)
Midterm election	0.04 (0.08)	0.08 (0.10)	0.08 (0.10)	0.09 (0.13)	−0.02 (0.09)	0.02 (0.11)	−0.26 (0.19)	−0.39 (0.24)	0.08 (0.11)	0.11 (0.19)	−0.25 (0.25)	−0.13 (0.21)
Population	−0.67 (1.31)	−1.06 (1.79)	1.46 (1.39)	0.75 (1.67)	−0.45 (1.02)	−2.06 (1.19)*	2.87 (0.48)***	2.30 (0.92)**	3.29 (1.37)**	2.64 (2.40)	0.54 (2.38)	−2.11 (2.37)
Income per capita	−0.03 (0.76)	−0.44 (0.83)	0.54 (0.64)	0.19 (0.84)	−0.96 (0.74)	−1.80 (0.89)*	1.82 (1.03)	1.62 (1.74)	0.99 (1.55)	0.75 (1.42)	2.81 (0.96)**	0.00 (2.06)
Unemployment rate	0.15 (0.38)	0.02 (0.50)	0.38 (0.41)	0.00 (0.44)	0.43 (0.46)	0.12 (0.59)	0.62 (0.71)	0.91 (1.24)	1.01 (0.56)	0.88 (0.89)	−0.99 (0.56)	−1.90 (0.87)*
Local property taxes	−0.04 (0.27)	0.03 (0.38)	−0.13 (0.32)	−0.12 (0.37)	0.18 (0.31)	0.18 (0.43)	−0.97 (0.52)*	−0.44 (0.72)	−2.16 (0.30)***	−1.22 (0.84)	0.73 (0.81)	1.45 (0.93)

Table 5. (*Continued*)

	States With the Line-Item Veto						States With the Block Veto					
	Governor's strength						Governor's strength					
Forcing Variables	min{House,Senate}		House		Senate		min{House,Senate}		House		Senate	
Polynonmial functions	3-3	4-4	3-3	4-4	3-3	4-4	3-3	4-4	3-3	4-4	3-3	4-4
Tax and expenditure limitations	0.01 (0.12)	−0.15 (0.11)	0.03 (0.12)	−0.05 (0.13)	−0.04 (0.11)	−0.19 (0.12)	0.13 (0.16)	0.24 (0.23)	−0.01 (0.22)	−0.04 (0.33)	0.16 (0.24)	−0.09 (0.33)
Supermajority requirements	0.03 (0.09)	−0.13 (0.10)	−0.02 (0.08)	−0.15 (0.09)*	−0.02 (0.09)	−0.16 (0.12)	−0.01 (0.02)	0.05 (0.05)	−0.00 (0.01)	−0.01 (0.02)	0.03 (0.06)	−0.10 (0.10)
Density of the forcing variable McCrary (2008)	−0.17 (0.14)		−0.01 (0.14)		−0.25 (0.13)*		−0.19 (0.24)		0.32 (0.25)		−0.37 (0.30)	

Note: The line-item veto sample comprises 1712 state-years from 1960 to 2006. The block veto sample comprises 287 state-years from 1960 to 2006. The forcing variable, Governor's strength, is the percentage of seats that belong to the same party as the governor. Governor's strength is either defined as the minimum between the House and the Senate, or as the percentage of seats in the House, or in the Senate. The discontinuity is estimated at Governor's strength = 50%. Standard errors are clustered by state. Governor's party control Senate is an indicator variable taking value 1 if the majority in the Senate belongs to the Governor's party, and value 0 otherwise. Governor's party control House is an indicator variable taking value 1 if the majority in the House belongs to the Governor's party and value 0 otherwise. Democratic governor takes value 1 if the governor is a Democrat, and value 0 otherwise. Turnout is defined as the fraction of the population that turned out to vote in the last election. Midterm election takes value 1 if the election for that observation was a midterm election, and value 0 if the governor was also chosen in that election. Population is the state population in millions for a given year. Income per capita is the state income per capita in thousands of 1982-dollars. Unemployment rate is the state unemployment rate in a year. Local property taxes is the percentage of a state average property tax in a year divided by state GDP. Supermajority requirements takes value 1 if the state in that year requires a supermajority to vote for a tax increase. Tax and expenditure limitations takes value 1 if the state has a tax limitation rule on that year and value 0 otherwise. The last row presents the McCrary (2008) test for a discontinuity in the density of the forcing variable.

*Significance at the 10% level.

**Significance at the 5% level.

***Significance at the 1% level.

between the House and the governor is not confounded by the alignment of the Senate. Likewise, in the case the forcing variables is the Governor's strength in the Senate we also check the continuity of the variable Governor's party control House (row 2).

Note that in Table 5, row 3, observations on both sides of the cutoff are equally likely to have a Democratic governor or a Republican governor. This is important. If this were not the case, we would be unable to separately identity the effect of a unified government versus a partisan effect.

In Table 5, we can see that for the states with the line-item veto there are no covariates that present a statistically significant discontinuity that is robust to different parametric specifications. This is true whether the forcing variable is Governor's strength defined as the minimum between the House and the Senate, Governor's strength in the House alone, or Governor's strength in the Senate alone. The only result that questions the validity of the design in the sample of line-item veto states is a significant discontinuity at the density of the forcing variable Governor's strength in the Senate. This discontinuity may indicate a capacity of voters to manipulate the partisan control of the Senate at the cutoff. The estimate is only significant at the 10% level and as there are no imbalances among the other variables, we do not see this as a clear refutation of the validity of the design.

The balance tests for the states with the block veto do not show any significant and robust discontinuity except for the variables population and turnout, and only in the case the forcing variable is Governor's strength defined as the minimum between the House and the Senate. However, when the population and turnout variables are tested for imbalances for the House and Senate separately, no significant and robust discontinuity is found. Once again, we do not see this as a clear refutation of the validity of the design.

Overall, the regression discontinuity design seems valid and we can interpret the jump in the tax level at the 50% cutoff in the sample of states with the line-item veto as the causal effect of a move from a divided to a unified government. The results in Tables 4 and 5 show that the regression discontinuity design (RDD) for the state Houses is particularly robust.[30] This does not mean that the alignment between the Senate and the governor has no effect on the tax level. The Senate may still play an important role in determining how the degree of alignment affects the tax level away from the cutoff; for this reason, we did not discard the Senate in the estimates of the PLM in section.

4. Concluding Remarks

In our model, we have described how in the American states with the line-item veto the structure of the bargaining game between the governor and the legislature implies budgetary separation of powers. By budgetary separation of powers, we mean that the branch responsible for setting the tax level is not the full residual claimant of a tax increase. This is the "sting" of the line-item veto (see Carter and Schap 1990). With the line-item veto the governor can prevent the legislative branch from appropriating the tax proceeds as a residual claimant.

We also find evidence, in the context of the American states, for the hypothesis in Persson, Roland, and Tabellini (2000) that the tax level should be lower in the case there is separation of powers. This is an important contribution because the empirical evidence supporting this

[30] In the supplementary material, we show that the discontinuity estimated in Table 4 in the states with the line-item veto is robust to the exclusion of any state, of any decade, and also that only the discontinuity at 50% is significant.

hypothesis in the cross country setting is not strong; see Persson and Tabellini (2004), Acemoglu (2005), and Blume et al. (2009).

We go beyond Persson, Roland, and Tabellini (2000) by showing that the effectiveness of this formal separation of powers varies with the political configuration. The governor will only veto the budget proposal from a misaligned legislative majority. The effectiveness of the budgetary separation of powers varies in strength according to the degree of political alignment between the vetoing branch and the proposing branch. Budgetary separation of powers in the U.S. states is not a categorical definition, but may vary in intensity according to the political conflict between branches.

Finally, we have found empirical evidence that, when made effective by the presence of the line-item veto, the budgetary separation of powers does have a negative causal effect on the tax level. There is a clear jump in the tax level as the government moves from unified to divided in the states with the line-item veto: taxes go down.

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