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Budgetary Separation of Powers in the American States and the Tax Level: A Regression Discontinuity Design

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Keywords: Separation of powers, line item veto, tax level, regression discontinuity, nonparametric

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

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Abstract

Should the Federal government and the remaining American states adopt the line item veto? What are its effects? We use regression discontinuity design to claim that in states with the line item veto, divided government has a causal negative effect on the tax level. By investigating a panel of 38 American states from 1960 to 2006, we estimate a significant discontinuous increase of 13% in the tax level as the party affiliated with the Governor in the state Legislature switches from being the minority party to being the majority. In the nine states that have block veto, we find no significant discontinuity in the tax level. We also find little evidence to suggest that the partisan identity of the majority party in the Legislature has a causal effect on the state tax level.

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1 Introduction

In the American states, the Legislature has the power to write and amend the state budget and set state-specific taxes. In most states, the Governor may veto particular lines, items, words, or even trim values in the budget approved by the state Legislature. This sort of veto power differs from the veto power that the American President has over a budget approved by Congress. The President only has the power to veto the federal budget as a block. In political discourse, the line item veto is often cited as an institutional change that could be used to help curtail pork-barrel and log-rolling at the federal level[1]. Theoretical literature to date has provided no clear predictions regarding the effects of the line item veto on the tax level, and the empirical literature has provided conflicting results.

In order to understand the role of veto power, we also have to look at politics and partisanship. The political influence of a party over policy increases with the number of seats it holds in the

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[1] See Abney and Lauth (1985) for a survey that asks legislative budget officers about their perceptions on the line item veto and how frequently it is used. See Urofsky and Finkelman (2002) for an account on how the line item veto came close to being adopted under the Clinton administration.

Legislature. There is a discontinuous change in its influence, however, when it surpasses the 50% threshold. With such a majority, the party acquires the power to both propose a budget, and to set the level of taxation. This discontinuous change allows us to use regression-discontinuity design to try and identify a causal link between political control and the state tax level. For the purposes of this paper we define the tax level as the sum of state income, corporate, and sales taxes divided by state income.

Our forcing variable is *Governor's strength.* This we define as the percentage of seats in the state House of Representatives that belong to the same party as the sitting Governor, whether they be Democrat or Republican[2]. Above the 50% threshold, the interests of the Governor and of the Legislature majority are more likely to be aligned. In this case, we expect there to be less use for any veto power. Below this threshold, however, the government is divided, and their interests are less likely to be aligned. In this case therefore, we expect the power of veto to be more relevant.

The main result of this paper is that in the 38 states with the line item veto, we estimate a significant discontinuous increase of 13% in the tax level at the point at which *Governor's strength* crosses the 50% cutoff. Under the identifying assumptions of our regression discontinuity design, we estimate a causal effect: that the switch from a divided to an aligned government causes the tax level to increase. To check the validity of our regression discontinuity design, we look for evidence of discontinuities within the other covariates at the same 50% cutoff point. With the exception of the lagged tax level, which we discuss in detail in Section 6.7, we find that no covariate shows a significant discontinuity.

We also find two other interesting and complementary results. Firstly, in the nine states with a block veto, we find no significant discontinuity in the tax level. But this result is less robust than our main result. This is because the sample is small. Secondly, we find no discontinuous jump in the tax level as the control of the Legislature switches from Democrat to Republican. This suggests that a model showing budgetary separation of powers together with the degree of alignment between Governor and Legislature is more relevant to explain the tax level than a model that attributes different preferences over taxation to Republicans and Democrats.

In Section 2, we discuss related literature on the line item veto and on the role of the separation of powers on the tax level. In Section 3, we describe the model we developed to help interpret our data. In Section 4, we describe the data. In Section 5, we discuss the regression discontinuity design and the estimation procedures. In Section 6, we present our results.

2 Related literature

There are two papers in particular that relate to our work. Holtz-Eakin (1988) uses a panel from 1966 to 1983, running a fixed effect model, in which a dummy for the time invariant line item veto is interacted with a dummy for divided government and with other variables indicating the partisan identity of the Governor. In contrast to our results, he finds that this interaction dummy is positively correlated with the overall tax revenue, both for Democratic and Republican Governors. The second and, to our knowledge, most recent empirical work on the effects of the line item veto is that of Besley and Case (2003). They have 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 ours. Their estimations, however, are based on a

[2]The Senate plays an important role in writing and approving the budget. For the purposes of our regression discontinuity design, we have decided to focus on the states' Houses. In Section 6.3.3, we show that the political control of the Senate does not affect our result.

linear panel strategy with fixed effects[3].

The main contribution of our paper to this literature is to use a regression discontinuity design to try and identify a causal relation between divided government and a lower tax level in the American states with line item veto.

To some extent, we address Acemoglu (2005)'s critique of the comparative political economy literature as a whole. He argues that it is hard to identify the effect of a specific institution, because institutions tend to come in bundles. For example, Persson and Tabellini (2004) use the fraction of the population that speaks English in a country as an instrumental variable to estimate the effect that Presidentialism (separation of powers) versus Parliamentarism (no separation of powers) has on the size of government[4]. Potentially, the fraction of English speakers could be a good instrument for two reasons: firstly, one does not expect the fraction of English speakers to be directly related to the size of government; and secondly, the fraction of English speakers is positively correlated to the presence of a Parliamentary system. However, the fraction of English speakers is also correlated with many other institutional features such as, strong financial markets, good quality institutions, a majoritarian system, as well as other unobservable features, that tend to come in a bundle. Acemoglu (2005) notes that finding a correlation between Presidentialism (instrumented by the fraction of English speakers) and a smaller government size may be due to these other institutions as well and, therefore, cannot be attributed to the separation of powers alone. By focusing on the American states, we are able to control for common institutions across states. In addition, our regression discontinuity design allows us to test whether the incidence of a particular institutional feature is playing a role in our result.

In this paper, we also contribute to the theoretical literature that has looked at the line item veto, such as Carter and Schap (1990) and Holtz-Eakin (1988). Both papers propose models with preferences represented in either a one or a two-dimensional space. These preferences relate both to types of expenditure, and to the tax level in general. In addition, both papers model the line item veto as a tool to bring the proposed budget closer to the Governor's preferred point within this space. Since the Governor's preferred point may be anywhere, bringing the budget closer to it does not necessarily imply that the overall level of taxation is lower. Neither model has a clear testable prediction on the tax level.

We propose a simple model with a clear prediction. We look at the budgetary separation of powers in the American states. Our definition of the 'budgetary' separation of powers is similar to Persson et al. (2000)'s description of the 'separation of powers'. In their model, Persson et al. (2000) define separation of powers as being one agent having the power to choose the tax level, and another having the power to allocate resources. If these powers are combined into one agent, or if two agents holding these powers act in response to a single constituency, there is no separation of powers. Persson et al. (2000) show that taxes are lower in a regime with such a separation of powers, because the 'tax setter' is not the residual claimant of a tax increase. In their interpretation, this sort of separation of powers is associated with a Presidential regime. We consider this interpretation to be invalid for the American states. This is because the budgetary separation of powers in the American states is different: both the power to set the tax level and to write the budget lie within the Legislature[5]. Whereas the Governor has veto power over the budget. In this paper, we investigate how the presence of the line item veto may prevent the state Legislature from being the full residual claimant of a tax increase. Thus creating the

[3]Abrams and Dougan (1986) and Alm and Evers (1991) use cross-sectional data and find conflicting results. Bohn and Inman (1996) work with a panel of 47 states from 1970 to 1991. Since the line item veto is time invariant in their sample, they regress the fixed effects on the institutional features. They find that states with line item veto and no-deficit rules have lower deficits.

[4] The size of government is defined as central government expenditures divided by GDP.

[5]In some states, although the Governor's office may write the first budget proposal, once it reaches the Legislature it can be changed and amended at will.

conditions for the budgetary separation of powers to have an effect on fiscal policy.

In the model described in Section 3, we look at the degree of alignment between Legislature and Governor. Grossman and Helpman (2008) propose a theoretical model that explores the role of different degrees of alignment between legislative and executive on the budget process[6]. They focus on how different degrees of alignment between the executive and the legislative can produce two types of budget: those with earmarked items, and those which give discretion to the executive. Grossman and Helpman (2008) show that the legislative tend to give more discretion to the executive when both the legislative and the executive have a large overlap in their constituencies. When the overlap is small (such as in a divided government), the legislative allows considerably less discretion to the executive. In their model, earmarks are the only way that the legislative is able to send transfers to their constituency in a divided government. They do not consider the role of veto power. As an alternative approach, we explore how different levels of alignment interact with veto power, and the effect that this interaction has on the tax level.

3 Model

In order to create a testable prediction of the effects of the line item veto on the tax level, we developed a model of the budgetary process in the American states as a noncooperative bargaining game[7]. In this model, one agent, the Legislature, proposes a budget composed of a tax level and of a proposal for the allocation of tax revenues. The other agent, the Governor, has veto power over the budget. Once the budgetary process is modeled as a noncooperative bargaining game, the differences between the line item veto and the block veto become clear. In a state with block veto the budget is a take-it-or-leave-it offer, whereas in a state with line item veto, there is a final stage in which the budget can be trimmed. The line item veto will only be effective when the Legislature's majority and the Governor are not from the same party (divided government). When their interests are aligned, it is as if there were no veto power. Furthermore, the high cost implied by the outside option triggered by the block veto means it does not play a role, regardless of whether the government be aligned or divided.

There are two parties in our model: Democrats and Republicans. We focus our attention on cases where these parties have an equal number of supporters, i.e. 50% within the population. In this instance, election results would have to be decided by random events, such as small variations in turnout or the flipping of a coin. When elections produce an aligned government, both the Governor and the Legislature answer to the same party, and the second party is not required to pass the budget. For example, when the Republicans control both the Legislature and the Governorship, the Democratic half of the population is excluded from power. If, on the other hand, the government is divided, each agent (Governor and Legislature) is controlled by a different party[8].

We assume that the Governor and the majority in the Legislature maximize the utility of their own party supporters. Each group of supporters i is populated by a mass of size one of

[6]Throughout the American states, the legislative is called the Legislature and is composed of the state House and the state Senate. The executive is the Governor's office.

[7]Kousser and Phillips (2009) model the state budgetary process as an noncooperative bargaining game. They are not looking into the role of either line item veto or divided government. Instead, they focus on the impact that the professionalisation of state Legislatures have on the discount factor, and therefore how the bargaining outcome may change as a result.

[8]This assumption of either having a fully aligned or a fully divided government simplifies the model, but is not necessary. All we need to generate the prediction of a discontinuous change in the tax level is a discontinuous change in the degree of alignment between parties, whenever governments switch from divided to aligned.

identical agents with utility given by:

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

where f_i, $i \in \{d, r\}$ is a group-specific monetary transfer; and $H(\cdot)$ is a continuous, twice differentiable, increasing, strictly concave function, which implies a decreasing marginal net benefit of the public good, g. We assume that $H_g(0) > 1$,[9] so that the first unit of taxation preferably goes to the public good, and that $H_g^{-1}(\frac{1}{2}) < 2$, so that the optimal level of g is an interior solution. There are no spending externalities across groups. We normalize total taxable income in each group, $y \equiv 1$. A lump sum tax, $\tau \leq 1$, is the same for each group. The total budget is 2τ.[10] When deciding on the budget, the Legislature and the Governor face the following constraint[11]:

$$2\tau \geq \sum_i f_i + g.$$

The timing of the model is as follows. The Legislature makes a budget proposal $q = (\tau, f_d, f_r, g)$. In the next move, the Governor may veto this proposal. If the Governor has line item veto power, they can cut either f_d, f_r, or g, and taxes are lowered to keep the budget balanced. If the Governor has block veto power, the veto implies that an outside option is implemented. We assume this outside option is too costly for the block veto to be a credible threat. For simplicity, we let the outside option yield a utility of 0, meaning taxes have been paid, $\tau = 1$, but no public good or transfers are provided, $g = f = 0$[12].

A word is needed to justify our assumption of a prohibitively costly block veto. Each state government deals differently with stalemates in the budget process. Two of the states with block veto (NC and NH) allow for continuing temporary resolutions. Three others (NV, VI, and WA) have no specific procedures to deal with this eventuality, therefore meaning that a government shut-down is possible. During a government shutdown, government employees stay at home and all government-provided services stop, except for those within essential areas [13]. In the remaining states (IN, IO, ME, and VT), a government shut-down is determined by state law. We believe that this assumption for the outside option captures the difference between line item veto and block veto appropriately, especially with regards to their role in a noncooperative bargaining game.

In our model, we look at four different setups: 1) aligned government in a state with block veto; 2) aligned government in a state with line item veto; 3) divided government in a state with block veto; and 4) divided government in a state with line item veto.

Setups 1 and 2. These two setups can be described as one. When the government is aligned both the Legislature and the Governor maximize the utility of the same group of supporters, and hence the type of veto does not play a role. Without loss of generality, let this group be Group r:

$$\begin{aligned} Max_{\tau,g,f_r,f_d} \quad & 1 - \tau + f_r + H(g) \\ s.t. \quad & 2\tau \geq f_r + f_d + g. \end{aligned}$$

[9] $H_g(.)$ is the first derivative of the function $H(.)$ with respect to g.

[10] This setup allows for taxation of 100% of GDP. It is a simplification and we interpret $\tau = 1$ to be the highest politically feasible tax level.

[11] We do not allow for deficits. Our model and empirical strategy take a static approach. In practice, all states except Vermont have some form of balanced budget requirement and no-carry-over deficit rules.

[12] The less stringent assumption is that the outside option has to be such that $H(g^{BV}) > U(outside\ option)$, where g^{BV} is derived below.

[13] See NCSL document 'Procedures When the Appropriations At 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).

Note that $f_d \geq 0$ is a cost to Group r and therefore in equilibrium $f_d = 0$.

Also note that the marginal benefit of taxation is 1, whilst its marginal cost is $\frac{1}{2}$. Taxation is shared between the two groups: d and r, but only Group r benefits in direct transfers. This insures that it is optimal to set taxes at the maximum, because once the marginal benefit of the public good decreases to the point to which it equals the marginal benefit of the direct transfer, 1, Group r wants as much in transfers as possible. The solution to the bargaining problem gives us: $\tau = 1$, $g^{BV} \equiv H_g^{-1}(1)$, $f_d = 0$, $f_r = 2 - g^{BV} > 0$.

Setup 3. In a state with block veto and a divided government, let Group r support the Legislature, and Group d the Governor. We solve this bargaining problem through backward induction. The outside option implies that any policy proposed by the Legislature giving a utility higher than 0 to group d, will be accepted by the Governor. Therefore, the solution to this problem is the same as the solution to the unconstrained maximization problem exemplified in Setups 1 and 2. It yields utility $U_d = H(g^{BV})$ to the supporters of the Governor. Taxes are set at $\tau = 1$ and the supporters of the Legislature receive a transfer of $f_r = 2 - g^{BV} > 0$ on top of the public good. Because of the sequential nature of the bargaining and the severity of the outside option, i.e. government shutdown, our model predicts that in the states which have block veto, the tax level will be the same in both divided and aligned governments.

Setup 4. In a state with line item veto and a divided government, let Group r support the Legislature, and Group d the Governor. We solve this bargaining problem through backward induction. In the last stage of the game, any positive transfer to Group r ($f_r \geq 0$) will be cut to zero by the Governor to $f_r = 0$. The Legislature takes that into account when proposing a budget, and solves the following problem to maximize the utility of its supporters, Group r:

$$\begin{aligned} Max_{\tau,g,f_r,f_d} \quad & 1 - \tau + H(g) \\ s.t. \quad & 2\tau \geq f_d + g. \end{aligned}$$

The solution to this problem yields $f_r = f_d = 0$, $g^{LIV} \equiv H_g^{-1}(\frac{1}{2})$, and $\tau = \frac{g^{LIV}}{2}$.

Our model has the clear prediction that in states with line item veto, we expect the tax level to be lower when the government is divided, than when the government is aligned. In states with block veto, we expect no difference in the tax level.

To summarize, in this section we have defined the formal 'budgetary separation of powers' as the Legislature having power over both the tax level and the allocation of tax revenues, whilst the Governor only has the veto power over the budget. We have identified two necessary but not sufficient conditions for budgetary separation of powers to affect fiscal policy. These are firstly, that the Governor must have access to a particular type of veto power, i.e. the line item veto; and secondly, that the interests of the Governor and of the Legislature majority be not fully aligned. If both these conditions are satisfied, then the Legislature is not the full residual claimant of a tax increase and, therefore, finds it optimal to keep the tax level below the maximum[14].

4 Data

In this section, we discuss the data we use to test the prediction produced by our model.

We analyze a sample of 47 American states from 1960 to 2006. Most of our political, fiscal, and population variables are the same as those used by Besley and Case (2003)[15]. We have updated Besley and Case (2003)'s sample from 1960 to 1998 with data from 1999 to 2006. Some

[14]It is important to stress here that this model is based on the institutions of the American states, and on the political support for both parties being evenly divided within these states .

[15]We are thankful to Timothy Besley and Anne Case for making their data sets available to us.

institutional and procedural variables have been collected from the National Association of State Budget Offices (NASBO) and the National Conference of State Legislatures (NCSL). There is not enough data to include Alaska and Hawaii. Nebraska is excluded for being the only unicameral state and for having a non-partisan Legislature. We exclude 21 observations with independent Governors. We exclude Minnesota because until 1972 it had a non-partisan Legislature and from 1982 to 2002, its Governors were not those that had been chosen by the two major parties during the primaries[16]. We also exclude Arkansas, California, and Rhode Island, because they all require a two-third majority in order to pass the budget, which implies a different cutoff point of *Governor's strength*= $66.\overline{6}\%$, and there is not enough data to reliably reproduce our estimation procedure at this cutoff.

In our sample, the average tax level of the American states is around 5% of GDP. As we mentioned in Section 1, the tax level is defined as the sum of state income, sales, and corporate taxes divided by state GDP. We also have data on state expenditures, which averages at 10% of GDP. Much of this expenditure is determined by Federal transfers and local programs, which are neither under the control of the state Legislature nor the Governor. Since our model is silent on the role the Federal and local governments have on fiscal policy[17], we decided to focus solely on tax revenue.

We also show results with an alternative measure for the tax level: state taxes per capita. Taxes per capita seem to be more time dependent than tax revenues over GDP, however. The average taxes per capita across states in 1982-dollars during the 1960's is $354. This jumps to $560 in the 1970's, $669 in the 1980's, $834 in the 1990's, and $961 in the 2000's. Taxes over GDP are much more stable across the same period: 4.5% in the 1960's, 5.7% in the 1970's, 5.8% in the 1980's, 5.9% in the 1990's, and 5.9% in the 2000's. We prefer to use taxes over GDP as our preferred dependent variable because it is potentially less vulnerable to outliers from the 1960's and to comparisons of estimates from the observations of different decades. Even when using taxes over GDP, however, the 1960's is an outlier decade. Because of this, one of our robustness checks is to estimate our results excluding this period.

An alternative measure to tax revenues over GDP and to taxes per capita would be to look at the tax rates themselves. We do not do this for two reasons. Firstly, we have not found the necessary data[18]. Secondly, there are ways in which to increase the tax level without changing the tax rate, such as not cutting taxes when the economy is growing (since taxes are progressive), or increasing prevention efforts against tax evasion.

Throughout our sample thirty-four states have line item veto; five states have block veto: Indiana, North Carolina, New Hampshire, Nevada, and Vermont; and four states adopted the line item veto during our sample period: Iowa, Washington, Virginia, and Maine[19]. We divide our data into two sub-samples according to the type of veto power. The four states which change status appear on the block veto sub-sample up to their adoption of the line item veto, and then

[16] We discuss Minnesota in detail in the Appendix, Section A.2.1.

[17] We are assuming away how tax rates are set in federal units that take central government tax policy into account. For a discussion, see Klor (2005). We are also assuming away how the partisan alignment between states and the federal government may affect Federal transfer. For an empirical discussion on Spanish data see, Solé-Olléa and Sorribas-Navarro (2008).

[18] We do have data for some states on when income and corporate taxes were adopted. In our sample, seven states with line item veto adopted either income or both income and corporate taxes: Connecticut (1970), Florida (1972), Illinois (1970), Michigan (1968), New Jersey (1962), Ohio (1972), and Pennsylvania (1971). All states, except Ohio, created new taxes under an aligned government. Four states with block veto adopted corporate or income taxes during this period, Indiana (1964), Maine (1970), Rhode Island (1970), and New Hampshire (1971). Two of these states had aligned governments, and two were divided. South Dakota, Texas, Washington, and Wyoming do not have a state income tax throughout the sample, but their exclusion does not change our results.

[19] Maine adopted the line item veto in 1995, and the remaining three states adopted it in 1969. For a discussion on why states adopt the line item veto, see de Figueiredo Jr. (2002).

they appear on the line item veto sub-sample.

We have additional data on the following variables: state population, income, and unemployment rate; the average state property tax, which is not decided by the Legislature; the political identity of the Governor; the partisan identity of the majority in the state Senate; whether or not the election was a midterm election; and election turnout. We also have data on whether the state has other institutional features that may affect the tax level: supermajority requirements for a tax increase, and tax and expenditure limitations. In Section 6, we follow standard practice and check these covariates for significant discontinuities around *Governor's strength*=50%. Any discontinuity in these covariates could be an indication that our regression discontinuity design is not valid.

5 Regression discontinuity design

5.1 Design

Regression discontinuity is a quasi-experimental design. Its defining characteristic is that the probability of receiving treatment changes discontinuously as a function of one or more underlying variables[20]. The treatment, call it t, is known to depend in a deterministic way on an observable variable, g, known as the forcing variable, $t = f(g)$, where g takes on a continuum of values. But there exists a known point g_0 where the function $f(g)$ is discontinuous. [21] The main identifying assumption of the design is that the relation between other covariates and g must be continuous around g_0. If that is the case, the only variable that is different near both sides of the cutoff is the treatment status. As a result, the discontinuity in t is identified as being caused only by the changes in treatment status. One main caveat of the design is that it can only claim to identify a causal relation locally, i.e. at the cutoff.

In this paper, the forcing variable is *Governor's strength*, and the dependent variable is the state tax level. If the forcing variable is below 50%, the observation receives treatment. The treatment is 'divided government'. At each period, an observation is either assigned the treatment or not. For the observations in which the election for the state House delivered a slim majority, we argue that the assignment of treatment was as good as random. Furthermore, we administer treatment to two groups of states with different characteristics. In the states with line item veto, we expect the treatment to have an effect. In the states with block veto, we expect the treatment to have no effect.

There are limitations to this interpretation of our data. Firstly, whether a state has the line item veto or block veto is mostly time invariant. We observe only four changes in our data set and the choice to adopt one type of veto over another is endogenous and could be correlated with other variables that we do not observe. Consequently our results concerning the effect of divided government on the tax level within states that have the line item veto are stronger than the results concerning the comparison between the two sets of states.

Secondly, we are applying a method originally designed for micro data, usually individual-level data, to a macro data set, in which our observations are of states in a specific year. We follow Holtz-Eakin (1988) and Besley and Case (2003) and take a static approach. We use regression discontinuity design to infer a causal relation between divided government and the tax level.

[20] For a detailed review of the regression discontinuity in Economics, see Lee and Lemieux (2009).

[21] More formally, the limits $t^+ \equiv \lim_{g \to g_0^+} \mathbf{E}[t|g]$ and $t^- \equiv \lim_{g \to g_0^-} \mathbf{E}[t|g]$ *exist* and $t^+ \neq t^-$. It is also assumed that the density of g is positive in the neighborhood of g_0. There are two types of discontinuity design, fuzzy and sharp designs. In the sharp design, treatment is known to depend in a deterministic way on some observed variables. Whereas in the fuzzy design, there are also unmeasured factors that affect selection into treatment. Our case fits the sharp design.

We consider this is an important first step, but ultimately we think that the dynamic nature of variables such as the tax level and income should also be taken into account. The most we do in this paper is to allow for serially correlated errors of a given state over time; we always show standard errors robust to clustering by state. We consider the main challenge to the validity of our design to be that we find a significant discontinuity for our lagged dependent variable. We discuss this result in more detail in Section 6.7.

Thirdly, an important assumption for our argument that divided government is assigned randomly at the cutoff is that some state districts must have had a close election. It could be the case that even though the number of seats a party hold in the Legisalture is very close to 50%, all the individual state districts were won by a landslide majority. This assumption becomes less stringent when we look at the states' House of Representatives than when we look at the states' Senates. In our sample, state Senates have an average of 40 seats and have staggered elections, in which half the seats are contested at each biennial election. On average, a state's House has 110 seats and these are simultaneously contested every two years. It is easier for our assumption to be satisfied in elections for the House than for the Senate. For this reason, we focus our regression discontinuity design on the state House. We treat the political control of the state Senate as another covariate, despite the fact that, in actuality, the House and the Senate have similar powers over the budget. Specifically, we show that the likelihood of the state Senate being aligned with the Governor is the same on both sides of the cutoff and, therefore, the alignment of the Senate does not drive our results.

Finally, another key assumption we need to make is that, particularly in matters of budgets, representatives will vote within party lines. Political scientists tend to agree that parties influence the policy making process. They disagree on the mechanisms, strength, and domain of this influence[22]. An example of this can be seen in Wright and Schaffner (2002), who compare the unicameral non-partisan Nebraska legislature with the Kansas Senate. They claim that these two chambers are comparable in almost all aspects, with the exception of Nebraska being officially run as non-partisan. Wright and Schaffner (2002) use roll-call data from 1996 to 1998 to determine the ideological location of each representative in a spatial voting model. They also find that although the main dimension, usually identified with a liberal-conservative line, does well in predicting how the partisan senators in Kansas will vote, it does not help to predict how the non-partisan members of the Nebraska legislature will vote. Wright and Schaffner (2002) conclude that this is an indication of the influence of parties on representatives' behavior. Similarly, Aldrich and Battista (2002) look at roll-call data and spatial analysis in order to measure the polarization of different state legislatures. They find a strong positive relationship between slim majorities and the more polarized Legislatures. Aldrich and Battista (2002) finding is important for the purposes of this paper, as our assumption that representatives vote according to party line has to hold around the 50% cutoff point in particular.

5.2 Estimation methods

With the above mentioned caveats in mind, we implement the regression discontinuity design methods following Lee and Lemieux (2009) and Imbems and Lemieux (2008). In this section we discuss the estimation methods used, and we present our main results in Section 6.

In order to estimate the discontinuity at the cutoff in practise, we estimate two functions: one with observations to the left, and one with observations to the right. The precision of the estimate depends on how much flexibility we allow the functional form to have. One option is to impose a parametric structure; we use a different quartic polynomial for each side of the discontinuity[23].

[22]For a review of the role of parties in Congress, see Smith (2007).

[23]We have experimented with other polynomial degrees and found similar results to our main specification when

The advantage of this method is that estimating the discontinuity and calculating the standard errors is straightforward. One of our main concerns is that our results are sensitive to the polynomial degree and that the use of this method, as opposed to a nonparametric estimate, uses data points too far from the 50% cutoff point. In all Figures in this paper, the solid line indicates the parametrically estimated functions.

An alternative to the above method is to use a nonparametric approach. This does not impose any constraints on the functional form. We follow the standard nonparametric approach and use local linear regression with a triangular kernel[24]. The local linear regression method, as argued in Hahn et al. (2001), fairs relatively better at the boundaries than other methods and, therefore, is the most appropriate method to use with regression discontinuity design. A local linear regression estimates a regression function at a particular point by only using data within a bandwidth surrounding this point. The Kernel function gives more weight to the data that is closest to the point being estimated.

Nonparametric results are sensitive to bandwidth choice. Imbens and Kalyararaman (2009) propose a method to calculate an optimal bandwidth specifically for regression discontinuity design. Their method yields a bandwidth of 15 when applied to the tax level and *Governor's strength*. Because most of the variability in this data seems to be away from the discontinuity, we repeat the procedure on data within the medians of samples to the left (*Governor's strength*= 38%), and to the right (*Governor's strength*= 65%) of the 50% cutoff. The optimal bandwidth for the sub-sample between the two medians is 7.[25] We present results for those two bandwidths throughout this paper. If the optimal bandwidth for a particular variable is other than 7 or 15, then we present the results for this third bandwidth as well. Graphically, we present the estimated function by a local linear regression with bandwidth 7. At each point, the predicted value is represented by $\times$. We present the graphic result of the smaller bandwidth, because we consider it a more adequate contrast to the parametric estimate, which uses the whole sample.

In addition, we also present local averages in intervals of width 0.5. This can be seen in Figure 1, where the local average of a point *Governor strength's*= g_o is measured using the average tax level in the intervals $(g_o - 0.25, g_o + 0.25]$. These intervals are constructed so that the interval immediately to the left of the 50% cutoff is $(49.5, 50]$. This interval contains 19 observations with an average tax level of 4.5% of GDP. The interval immediately to the right is $(50, 50.5]$. It contains 8 observations with an average tax level of 5.4% of GDP. The local averages are represented by a dot. They are a crude estimate for the discontinuity, but they are a good indicator of the variability of the data.

For parametric estimates of discontinuities at the cutoff, we present Huber-White standard errors robust to both heteroskedasticity and clustering by state. For the nonparametric results,

allowing for a third degree polynomial or higher. These results are available on request.

[24] The method is described in detail in Pagan and Ullah (1999), p.93. It consists in minimizing for m:

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

where $K(.)$ is the kernel function and h the bandwidth. Let $s = \frac{x_i - x}{h}$, the triangular Kernel is defined as:

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

[25] A bandwidth of 7 implies that the point immediately to the left of the cutoff is estimated with data in the interval (43, 50], and that the point immediately to the right is estimated with data in the interval (50, 57]. Within these two intervals there are 438 observations, making up 26% of the sample. Out of the 36 states with line item veto, 26 are present. With the exception of four states, all appear on both sides of the discontinuity. With the exception of 5 states, all contain observations with Governors from both parties.We have experimented with other bandwidths and the results do not change much with bandwidths 3-15. Some of these results can be seen in Section 6.7, Table 10.

the heteroskedastic robust standard errors are calculated with standard least squares methods, as noted in Imbems and Lemieux (2008). The variance of the estimated jump is the sum of the variance of the two point estimates at the cutoff, with one using data to the left of the cutoff and the other using data to the right. To estimate cluster robust standard errors for the nonparametric estimate we use the wild cluster bootstrap. It does not require the residuals to be i.i.d., nor does it require each cluster to have the same size[26]. Cameron et al. (2008) use Montecarlo simulations to show that the wild cluster bootstrap works well, particularly when the number of clusters is small. As is shown in our results, the theoretical cluster robust standard errors in the parametric estimates are similar to those estimated by the wild bootstrap procedure with a local linear regression.

6 Regression Discontinuity Estimates

6.1 States with line item veto

Our main results are summarized in Figures 1a, 1b, and Table 1. We estimate a statistically significant jump in the tax level around the cutoff point, *Governor's strength*=50%. The parametric quartic specification and the local linear regression with a bandwidth of 7 yield very similar results: a discontinuity of around 0.67. This is significant at the 10% level with standard errors robust to clustering by state. The local linear regression with a bandwidth of 15, yields a smaller estimate of the discontinuity: 0.39. This is significant at the 1% level with heteroskedasticity robust standard errors, and is close to significance at the 10% level when allowing for clustering by state. An estimate of 0.67 implies an increase in the average tax level from 5% to 5.67% of GDP, a 13% percent increase.

In Figure 1a, we can see that most of the variability in local averages (indicated by dots) lies within the graph's extremities, specifically in regions where *Governors's strength* is either very high or very low. The extremities are also the areas with the lowest density, as 55% of the data lies within the interval [35, 65].

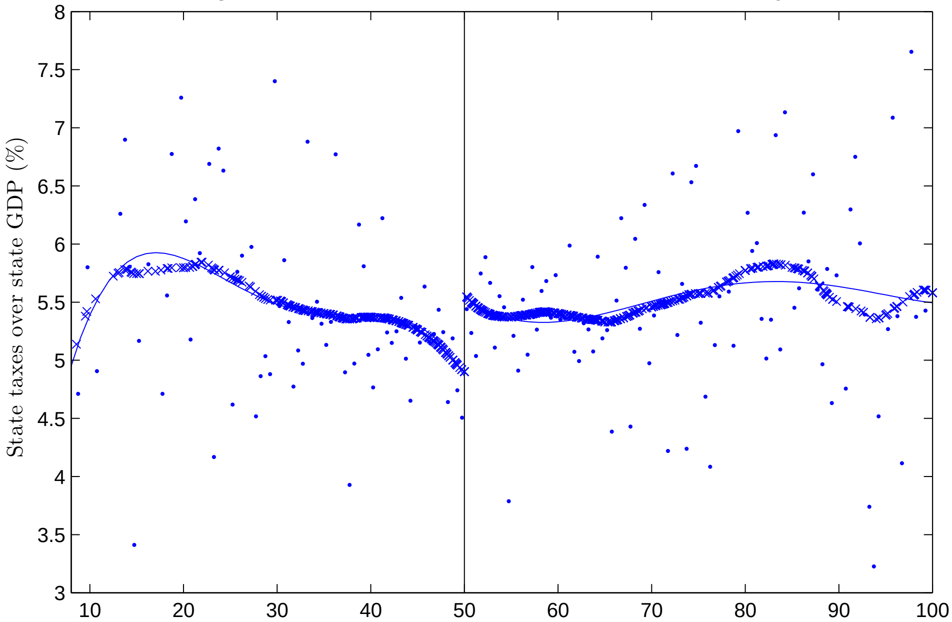
In Figure 1b, we focus on the data surrounding the discontinuity. One can see the statistical strength of the estimated discontinuity: the parametric and nonparametric estimates to the left of the cut off point lie below all the local averages to its right (50, 65], with one exception. The outlier local average at the 55% mark is due to two observations: Ohio in 1965 with a tax level of 2.8%, and Ohio in 1966 with a tax level of 2.8%. Similarly the estimate to the right of the cutoff is higher than most of the local averages to the left, with the exception a few that are far from the discontinuity.

6.1.1 Robustness checks

Regression discontinuity design and local linear regression estimates are particularly sensitive to outliers such as Ohio in 1965 and 1966. As mentioned in Section 4, the average tax level in our sample was much lower in the 1960's than in any other decade. The estimated discontinuity could have been driven by a few observations to the left of the cutoff from the 1960's. In order to eliminate any doubt, the first robustness check we implemented was to exclude the 1960's. We then continued excluding one decade at a time. As we can show in the Appendix : Section A.1, Table 11, the result is robust to each exclusion.

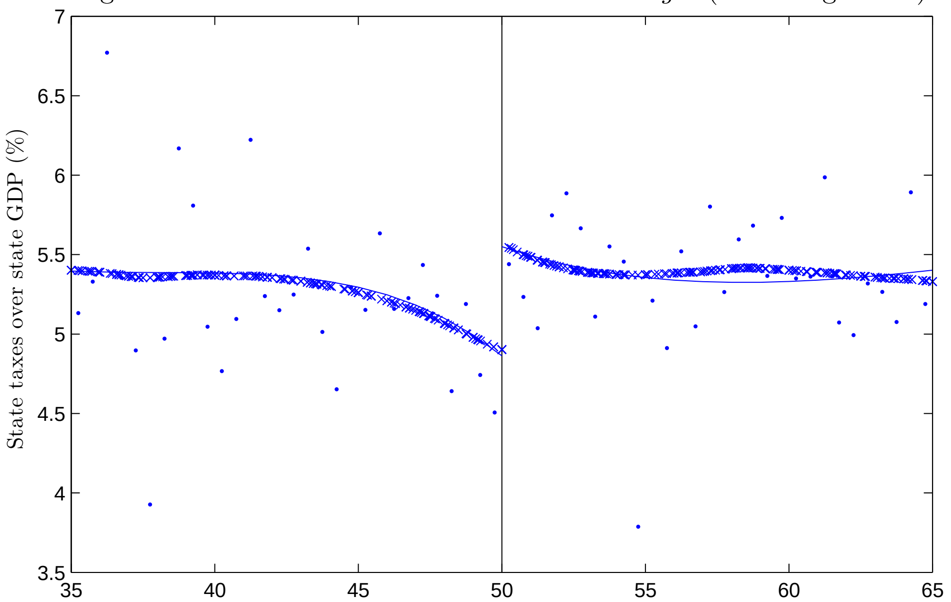
[26]Each new sample of residuals in the wild cluster bootstrap are the original residuals multiplied either by $\frac{(1-\sqrt{5})}{2} \simeq -0.618$ with probability $\frac{(1+\sqrt{5})}{2\sqrt{5}} \simeq 0.7236$, or by $1 - \frac{(1-\sqrt{5})}{2}$ with probability $1 - \frac{(1+\sqrt{5})}{2\sqrt{5}}$.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

Figure 1a: State tax level and *Governor's strength*



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

Figure 1b: State tax level and *Governor's strength* (detail Figure 1a)



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

Table 1: State tax level and *Governor's strength*

Method	Jump at 50%	Robust-SE	Bootstp mean	Cluster Robust-SE
4-degree polynomials	0.69	(0.21)***	-	(0.35)*
LLR(bandwidth 7)	0.66	(0.23)***	0.60	(0.36)*
LLR(bandwidth 15)	0.39	(0.15)***	0.35	(0.22)

Note: This sample is comprised of 1712 observations of states with line item 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 forcing variable is *Governor's strength*, which is the percentage of seats in the state House of Representatives that belong to the same party as the Governor. The discontinuity is estimated at *Governor's strength*=50%. The first row shows the results for a four-degree polynomial on each side of the cutoff. Theoretical heteroskedastic and cluster robust standard errors by state are in parenthesis. The last two rows show the results for a local linear regression specification with a triangular kernel and different bandwidths. Theoretical heteroskedastic robust standard errors are provided together with bootstrapped cluster robust standard errors (wild bootstrap with 10,000 draws each).

Our result could also have been driven by a particular state. To accomodate this, we also perform a robustness check excluding one state at a time. The discontinuity in the tax level remains significant and point estimates vary marginally. This is in-keeping with our main result, as can be seen in the Appendix: Section A.2, Table 12.

Since our estimation methods assume the existence of a cutoff point at 50% and estimate independent regressions on either side, it could be that our estimation methods (see Section 5.2) would show a significant discontinuity by construction. To check for this, we ran another robustness check looking for discontinuities at cutoff points at which we expect there to be no discontinuity, i.e. *Governor's strength*={45,46,47,48,49,51,52,53,54,55}. Even though these estimates are occasionally positive, none are statistically significant. See the Appendix: Section A.3, Table 14.

We also checked to see if our Table 1 results hold when using an alternative measure for the tax level. We use state tax revenues per capita in 1982-dollars. As in the case with taxes over GDP in Table 1, the estimated discontinuity is significant with heteroskedasticity robust standard errors for both the polynomial specification and the local linear regression. But when using cluster robust standard errors, we find that only the local linear regression with bandwidth 7 is significant. As can be seen in the Appendix: Section A.4, Table 15, depending on the specification the point estimates of the discontinuity vary from 62 to 142 dollars per capita. To the left of the cutoff, the average tax revenue per capita is around 700 dollars, implying a varying increase in the average tax level from 9% to 20%. This is in-keeping with our estimates of an increase of 13% in the tax level when using taxes over GDP as our dependent variable.

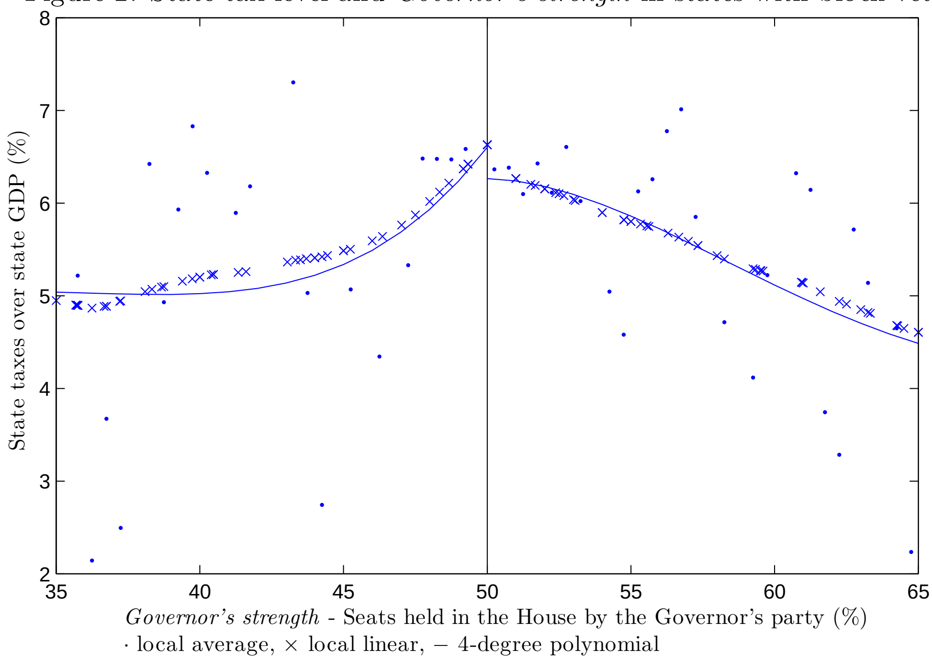
In order to conclude that this discontinuous jump in the tax level is caused by the switch from a divided to an aligned government, the relationship between *Governor's strength* and all other covariates around the cutoff point must be continuous. The identifying assumption is that the relationship between *Governor's strength* and the unobservable variables are also continuous around the cutoff point. Our next step is to check for discontinuities in the covariates. We do this in Sections 6.3.2 to Section 6.7.

6.2 States with block veto

In this section, we present our result that there is no discontinuity in the tax level in states with block veto.

One way to think of observations with block veto is as a control group, in which a treatment is applied. Due to the characteristics described in Section 3, however, we expect to find that the treatment will have no effect on the tax level. One problem with this interpretation is that we only have 292 observations for the states with block veto, unlike the states with line item veto, for which we have 1712 observations. Nevertheless, we apply the same estimation procedures to the observations with block veto. The results can be seen in Figure 2 and Table 2. These results are consistent with our model's prediction that there is no statistically significant discontinuity in the tax level in states with block veto[27].

Figure 2: State tax level and *Governor's strength* in states with block veto



6.3 Political parties and taxes

6.3.1 Partisan identity of the majority in the state's House of Representatives

In this section, we present our result that when we use the Democrat's seat share in the state's House of Representative as the forcing variable there is no discontinuity in the tax level in states with line item veto.

One of the main concerns for the validity of our research design is a conceptual one. An alternative partisan story could, a priori, be more appropriate to the data than the model we propose in Section 3. For example, one could conceive a model in which Democratic control of the Legislature leads to a higher tax level.

[27]The number of states in this sample (9) is too small to meaningfully estimate the variance-covariance matrix that allows for clustering by state. For example, in the parametric estimate, the number of clusters is the same as the number of covariates.

Table 2: State tax level and *Governor's strength* in states with block veto

Method	Jump at 50%	Robust-SE
4-degree polynomials	-0.34	(0.28)
LLR(bandwidth 7)	-0.21	(0.19)
LLR(bandwidth 15)	0.05	(0.17)
LLR(bandwidth 11)	-0.06	(0.17)

Note: This sample is comprised of 292 observations of states with block veto. IN, NC, NH, NV, and VT have block veto throughout the sample, 1960 to 2006. IA, WA, and WV switched from block veto to line item veto in 1969; ME switched in 1995. 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 forcing variable is *Governor's strength*, which is the percentage of seats in the state House of Representatives that belong to the same party as the Governor. The discontinuity is estimated at *Governor's strength*=50%. The first row shows the results for a four-degree polynomial on each side of the cutoff. Theoretical heteroskedastic robust standard errors are in parenthesis. The last three rows show the results for a local linear regression specification with a triangular kernel and different bandwidths. Theoretical heteroskedastic robust standard errors are provided.

To investigate this point further, we use an alternative forcing variable: the percentage of seats controlled by the Democratic party in the state House. The results of this investigation can be seen in Table 3 and Figure 3. In the y-axis, we have the state tax level. For comparative purposes, we have kept the scale the same as in Figure 1b. As the percentage of seats held by the Democrats moves from the left to the right of the 50% cutoff point, the Democrats gain control both over the budget and the tax level. If the partisan model held, we would expect a discontinuous jump at the cutoff. The result of our estimation shows no significant discontinuity.

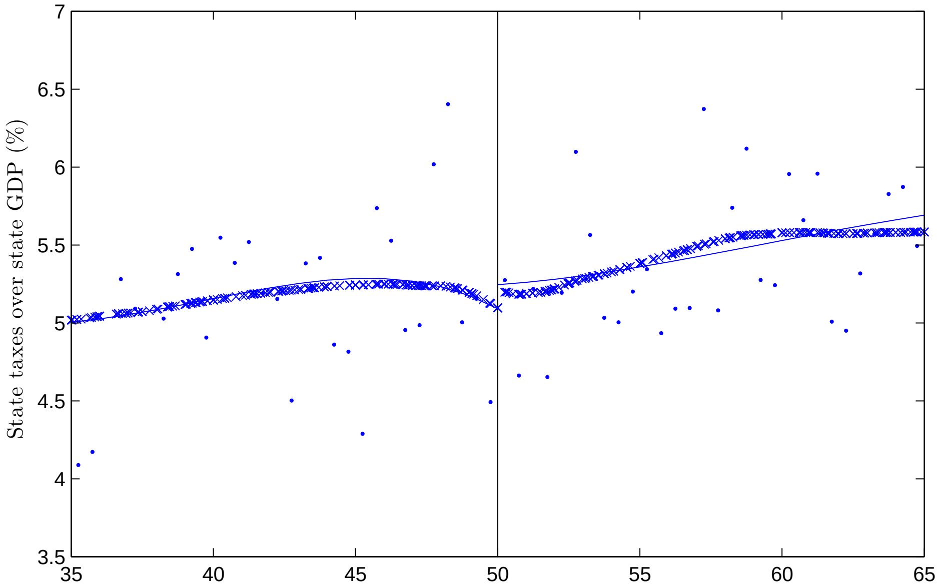
We do observe a positive correlation between Democratic control and a higher tax level. One possibility is to interpret this correlation as being caused by an unobservable variable, such as the preference of the electorate for a certain tax level. An electorate which prefers a higher tax level may be also more inclined to vote Democrat. This would imply that as the percentage of the electorate that prefers a higher tax level increases, so does the percentage of seats the Democrats hold in the state House. However, around the discontinuity, the electorate's preferences are assumed to be the same on both sides of the cutoff. The only variable that changes around the cutoff is the identity of the party holding the majority of the seats in the state House. As we find no discontinuity in the tax level, this result suggests that regardless of which party holds the majority, the resulting tax level is the same. This result is similar to the one that Ferreira and Gyourko (2009) find within American cities. They use regression discontinuity design to show that in American cities partisan identity has no effect on fiscal policy.

On the other hand, Reed (2006) uses a fixed-effect strategy and regresses five-year changes in the tax level on state characteristics, and on other variables indicating political control. He finds that Democratic control over the Legislature, measured as the percentage of the five year period in which Democrats controlled both state chambers, has a positive impact on the tax level[28].

Contrary to Reed (2006), the evidence reported here suggests that, at least when looking at slim majorities, the driving force for the change in tax level is the relationship between the Legislature and the Governor, i.e. are aligned or divided, and not the political identity of the Legislature.

[28] This result is similar to that of Pettersson-Lidbom (2008). He looks at Swedish local authorities and finds with a regression discontinuity design that left wing parties have an effect on fiscal policy.

Figure 3: State tax level and *Democratic control*



Democratic control - Seats held in the House by the Democratic party (%)
· local average, × local linear, − 4-degree polynomial

Table 3: State tax level and *Democratic control*

Method	Jump at 50%	Robust-SE	Bootstp mean	Cluster Robust-SE
4-degree polynomials	0.15	(0.22)	-	(0.34)
LLR(bandwidth 7)	0.11	(0.23)	0.00	(0.30)
LLR(bandwidth 15)	-0.07	(0.15)	-0.05	(0.26)
LLR(bandwidth 13)	-0.07	(0.17)	-0.08	(0.24)

Note: This sample is comprised of 1712 observations of states with line item 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 forcing variable is *Democratic control*, the percentage of seats in the state House of Representatives that belongs to the Democracts. The discontinuity is estimated at *Governor's strength*=50%. The first row shows the results for a four-degree polynomial on each side of the cutoff. Theoretical heteroskedastic and cluster robust standard errors by state are in parenthesis. The last three rows show the results for a local linear regression specification with a triangular kernel and different bandwidths. Theoretical heteroskedastic robust standard errors are provided together with bootstrapped cluster robust standard errors (wild bootstrap with 10,000 draws each).

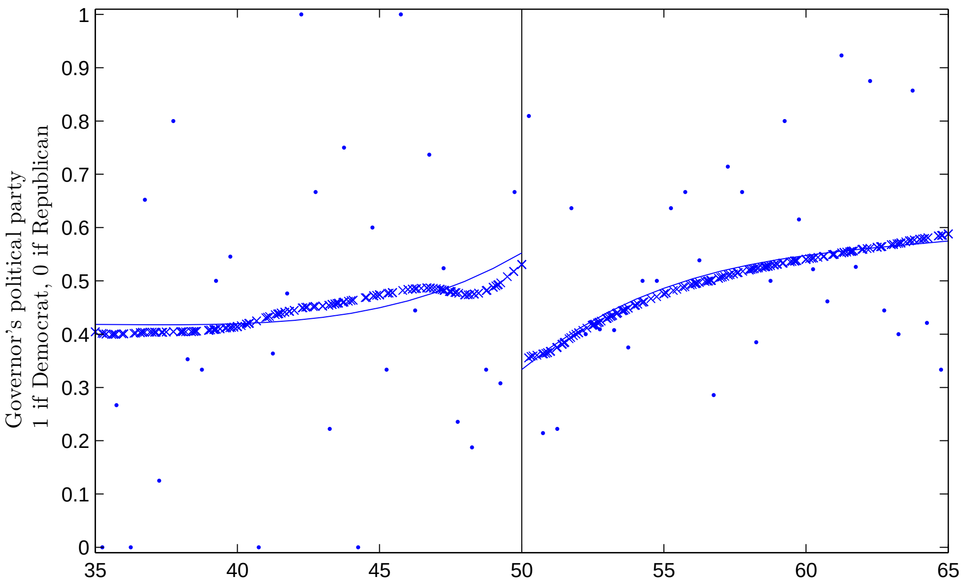
6.3.2 The Governor's political party

In this section we begin to test our main result, described in Section 6.1, by examining whether our forcing variable, *Governor's strength*, is associated with discontinuities in other covariates at the same 50% cutoff point.

In the first test, we treat the partisan identity of the Governor as a covariate. The results can be seen in Table 4 and Figure 4. In the y-axis we have an indicator variable taking value 1 if the Governor is a Democrat and 0 if the Governor is a Republican. We estimate a discontinuity, albeit not significant when allowing for clustering by state. The result indicates that divided governments, i.e. those to the left of the cutoff, are equally likely to have a Democratic or Republican Governor. The estimated value for the indicator variable to the left of the cutoff is 0.5. On the right side of the discontinuity, the point estimate is 0.35. This suggests that aligned governments are more likely Republican.

Counter to common beliefs and the causal interpretation of our main result, this result could indicate that aligned Republican governments deliver a higher tax rate than Democratic governments. But we must stress that this result is not significant when we allow for clustering by state in the error term. Moreover, the local average to the immediate right of the discontinuity is higher than the local average to its immediate left. This suggests, contrary to the direction of the estimation results, that close to the discontinuity, aligned governments are more likely to be Democratic. Overall, we do not regard the estimation results in Table 4 and Figure 5 as strong indicators of a discontinuity.

Figure 4: Governor's political party



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

Table 4: Governor's political party and *Governor's strength*

Method	Jump at 50%	Robust-SE	Bootstp mean	Cluster Robust-SE
4-degree polynomials	-0.21	(0.10)**	-	(0.14)
LLR(bandwidth 7)	-0.18	(0.11)*	-0.16	(0.14)
LLR(bandwidth 15)	-0.14	(0.07)**	-0.12	(0.09)
LLR(bandwidth 14)	-0.14	(0.07)**	-0.12	(0.09)

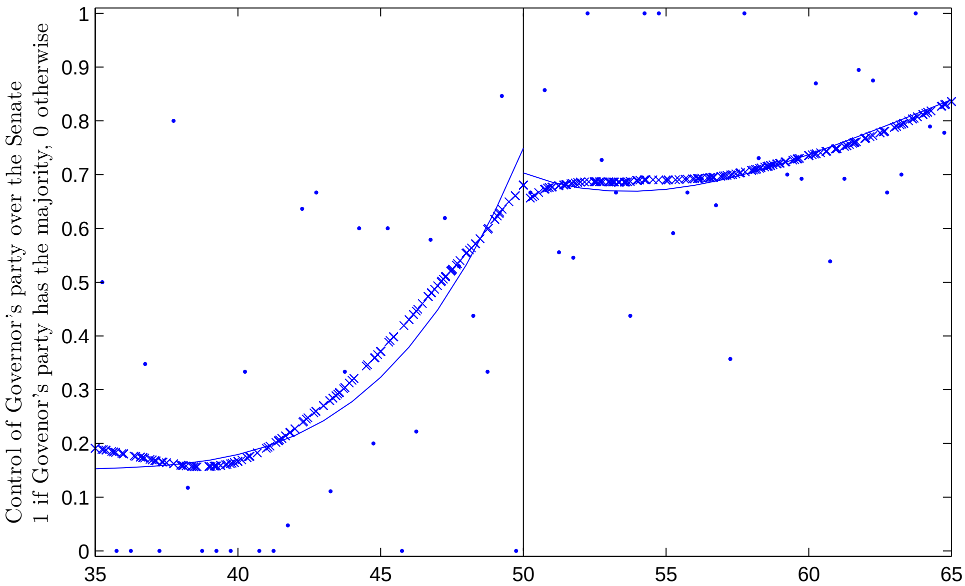
Note: This sample is comprised of 1712 observations of states with line item veto from 1960 to 2006. Each observation represents a state within a year. The dependent variable takes value 1 if the Governor is a Democrat and 0 if Republican. We have excluded 18 observations with independent Governors. The forcing variable is *Governor's strength*, which is the percentage of seats in the state House of Representatives that belong to the same party as the Governor. The discontinuity is estimated at *Governor's strength*=50%. The first row shows the results for a four-degree polynomial on each side of the cutoff. Theoretical heteroskedastic and cluster robust standard errors by state are in parenthesis. The last two rows show the results for a local linear regression specification with a triangular kernel and different bandwidths. Theoretical heteroskedastic robust standard errors are provided together with bootstrapped cluster robust standard errors (wild bootstrap with 10,000 draws each).

6.3.3 Control of the state Senate

In decisions regarding the budget and the tax level, the state Senate's role is equally important as that of the state House. The organization of the Senate, however, is different to that of the House. There are fewer senators (an average of 44) than House representatives (an average of 110), and senators have four-year mandates. In a typical election year, usually only half of the Senate's seats are up for election. In order to describe a slim majority as a random event, one of the assumptions needed is that a few individual seats in the race are close elections themselves (see Section 5.1). The small number of election in the average state Senate race makes it easy for this assumption to be violated. Because of this, the use of a regression discontinuity design to study the effect of the political control over the Senate on the tax level may be inappropriate. Consequently we do not look for a discontinuity in the relationship between the tax level and the degree of alignment between the Governor and the Senate.

Instead, we look at the control of the Governor's party over the Senate as another covariate represented as an indicator variable with value 1 if the Senate majority belongs to the same party as the Governor, and 0 if otherwise. Had we found a discontinuity in this indicator variable with the point estimate to the right of the cutoff being higher than the point estimate to the left, it would have implied that the Senate is more likely to be aligned with the Governor when the House is also aligned. But as is shown in Figure 5 and Table 5, we find no discontinuity. Observations to the left of the cutoff are as likely to have the Senate aligned with the Governor as those to the right of the cutoff, meaning that the control of the Senate cannot be driving our main result in Section 6.1.

Figure 5: Control of Governor's party over the state Senate



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

Table 5: Control of Governor's party over the state Senate and *Governor's strength*

Method	Jump at 50%	Robust-SE	Bootstp mean	Cluster Robust-SE
4-degree polynomials	-0.05	(0.09)	-	(0.14)
LLR(bandwidth 7)	-0.03	(0.10)	-0.01	(0.18)
LLR(bandwidth 15)	-0.01	(0.07)	0.05	(0.10)
LLR(bandwidth 10)	0.00	(0.08)	0.00	(0.14)

Note: This sample is comprised of 1712 observations of states with line item veto from 1960 to 2006. Each observation represents a state within a year. The dependent variable takes value 1 if the Senate is controlled by the Governor's party and value 0 otherwise. The forcing variable is *Governor's strength*, which is the percentage of seats in the state House of Representatives that belong to the same party as the Governor. The discontinuity is estimated at *Governor's strength*=50%. The first row shows the results for a four-degree polynomial on each side of the cutoff. Theoretical heteroskedastic and cluster robust standard errors by state are in parenthesis. The last two rows show the results for a local linear regression specification with a triangular kernel and different bandwidths. Theoretical heteroskedastic robust standard errors are provided together with bootstrapped cluster robust standard errors (wild bootstrap with 10000 draws each).

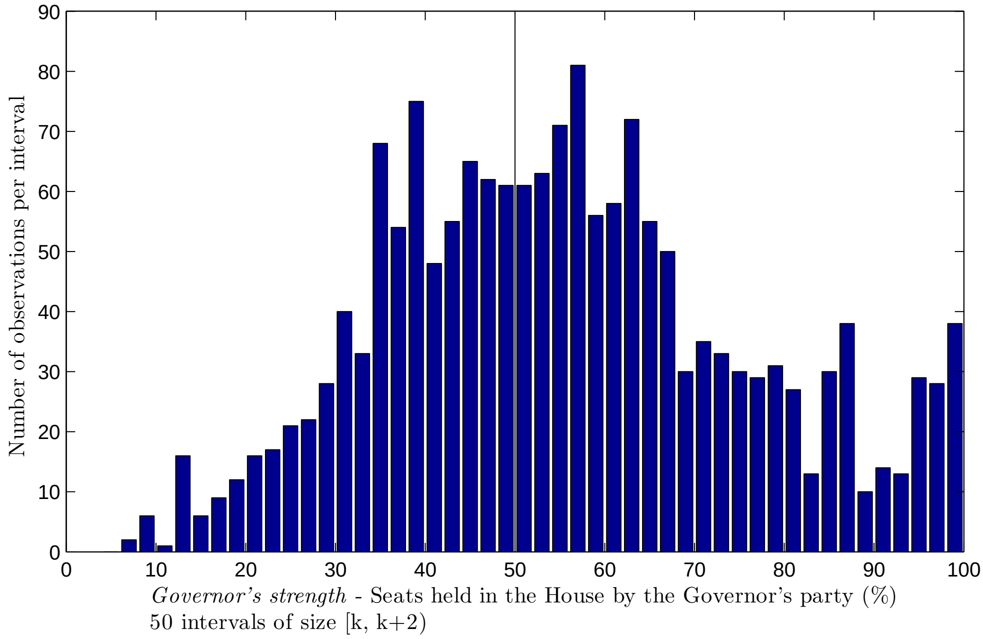
6.4 Checking for the manipulation of the forcing variable

6.4.1 Density of the forcing variable

A potential threat to our research design is the possibility that voters may manipulate the forcing variable (*Governor's strength*) to such extent that the final election result is no longer random. Consider a scenario where voters both prefer and are able to deliberately select a divided government, even during elections that seem close. In this case, we would expect there to be more observations to the left of the cutoff than to the right. In order to check for the manipulation of *Governor's strength* around the cutoff, we first look at its density. A discontinuity at the 50% cutoff could indicate that our forcing variable is being manipulated at the cutoff.

The histogram in Figure 6 indicates the number of observations in intervals of size 2 of the *Governor's strength* variable. The density is highest in the interval around the discontinuity, in fact, 70% of the data is within interval [30,70]. Of particular note in this sample is that there are the same number of observations in the interval [48, 50) as there are in the interval [50,52). The lack of a discontinuity in the density suggests that agents are not manipulating the forcing variable around the cutoff point.

Figure 6: Histogram of forcing variable



6.5 Checking for discontinuities in other covariates

In Table 6, we show that there are no significant discontinuities for the following covariates: turnout at last election, state population, state GDP in 1982-dollars, state unemployment rate, local property taxes, and in two indicator variables: one for whether an election was midterm or simultaneous, and one for whether a state has tax and expenditure limitations or not. We present the results only from our parametric estimations, as the graphical and nonparametric estimates produce similar results[29].

The fact that we do not find any discontinuities in variables such as turnout, and on the indicator variable for midterm elections re-assures us that our forcing variable is not being manipulated around the cutoff by voters. As Table 6 demonstrates, elections on both sides of the cutoff are equally as likely to be midterm or simultaneous, and have the same average turnout.

Table 6: Other covariates and *Governor's strength* - quartic-polynomial specification

Variable	Jump at 50%	Robust-SE	Cluster Robust-SE
Turnout	-0.03	(0.02)	(0.03)
Midterm election	-0.09	(0.10)	(0.11)
Population	0.75	(0.91)	(1.67)
Income per capita	0.19	(0.60)	(0.84)
Unemployment rate	0.00	(0.37)	(0.44)
Local property taxes	-0.12	(0.24)	(0.37)
Tax and expenditure limitations	-0.05	(0.08)	(0.13)

Note: This sample is comprised of 1712 observations of states with line item veto from 1960 to 2006. Each observation represents a state within a year. *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 0 if if the Governors 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 the state GDP. *Tax and expenditure limitations* takes value 1 if the state has a tax limitation rule on that year, and 0 otherwise. The dependent variable takes value 1 the Senate is controlled by the Governor's party and value 0 otherwise. The forcing variable is *Governor's strength*, which is the percentage of seats in the state House of Representatives that belong to the same party as the Governor. The discontinuity is estimated at *Governor's strength*=50% with a four-degree polynomial on each side of the cutoff. Theoretical heteroskedastic and cluster robust standard errors by state are in parenthesis.

Discontinuities in variables such as population, income per capita, and the unemployment rate could indicate that observations on both sides of the cutoff are not comparable. If, for example, states to the right of the cutoff were richer than states to the left, that in itself could explain the discontinuity in the tax level that we found in Section 6.1, since taxes are progressive. But because we do not find any discontinuity in these variables, as can be seen in Table 6, we are confident that our design has worked well, i.e. the differences in these characteristics cannot be the driving force behind the discontinuity in the tax level.

The states' local property taxes is an interesting covariate to look at, since property taxes are set by local authorities and not by the state Legislature. Suppose we had found a discontinuity in the average local property taxes similar to the discontinuity we found in Section 6.1 using state-wide taxes. Such a result would have been an indication that what is driving the discontinuity in Section 6.1 is a variable that influences all taxes, both local and state wide. And not the mechanisms we propose in our model in Section 3. As can be seen in Table 6, we find no significant discontinuity in the local property tax.

In the last row of Table 6 we look at an institutional feature that has been adopted by some of the states in our sample, tax and expenditure limitations. The majority of these limitations restrict expenditure growth to increases in income per capita or, in some cases, to inflation and population growth. Some of these limitations also restrict the size of appropriations to a

[29]The graphical and nonparametric estimates are available on request.

percentage of state income; whereas some have statutory bounds on expenditures growth rates[30]. Our data has an indicator variable, which takes value 1, should such a rule be in place within a state during that year and 0 otherwise. If the observations immediately to the left of *Governor's strength*=50% had had a higher fraction of state-years with tax and expenditure limitations than those observations immediately to the right, then this would have raised concerns regarding our results of a lower tax level to the left of *Governor's strength*=50% being at least in part driven by the incidence of tax and expenditure limitations. As shown in Table 6, however, we estimate no significant discontinuity.

6.5.1 Supermajority requirement

Another institutional feature we investigate is the supermajority requirement for bills that imply an increase in tax level[31]. In principle, when such a requirement is adopted it is no longer enough to hold 50% of seats to formally raise the tax level, which makes dealing with the observations that have supermajority requirements more problematic than dealing with other covariates.

One option for dealing with the 240 observations with supermajority requirements would be to drop them entirely. We explore this alternative in the Appendix: Section B, Table 16. There you can see that the discontinuity has a slightly higher point estimate than, and the same level of significance as, the results in Table 1.

We prefer to keep the observations with supermajority requirements. Firstly, not all supermajority requirements apply to all forms of taxation. Secondly, a state's tax level may increase either due to its economic growth or to increased efforts to counter tax evasion, even without a formal tax hike. In addition, tax cuts do not require a supermajority.

In Figure 7 and Table 7, we treat the incidence of supermajority requirements as another covariate and check for a significant difference in the fraction of observations with supermajority requirements to the left and right of *Governor's strength*=50%. If we were to find that this fraction is lower to the right of the cutoff, then this could go some way to explaining the discontinuity in the tax level. The results in Figure 7 and Table 7 are conflicting.

The parametric quartic specification indicates a significant discontinuity, but the nonparametric local linear regression indicates no discontinuity. Furthermore, the local average measured at the interval immediately to the left of the discontinuity does not contain any observations with supermajority requirements. This casts doubt on the parametric estimate at the left of the discontinuity.

The conflicting results between parametric and non parametric estimation may derive from a combination of the infrequency of the supermajority indicator variable and the parametric specification giving weight to observations far from the cutoff point. We do not consider the parametric estimates in this case to have enough reliance to affect the validity of our results.

[30] For more details, see Waisanen (2008).

[31] Supermajority requirements were mostly adopted in the 1990's. Most supermajority requirements include all taxes, but some are less restrictive, for details see Waisanen (2008).

Figure 7: Supermajority requirements for a tax increase

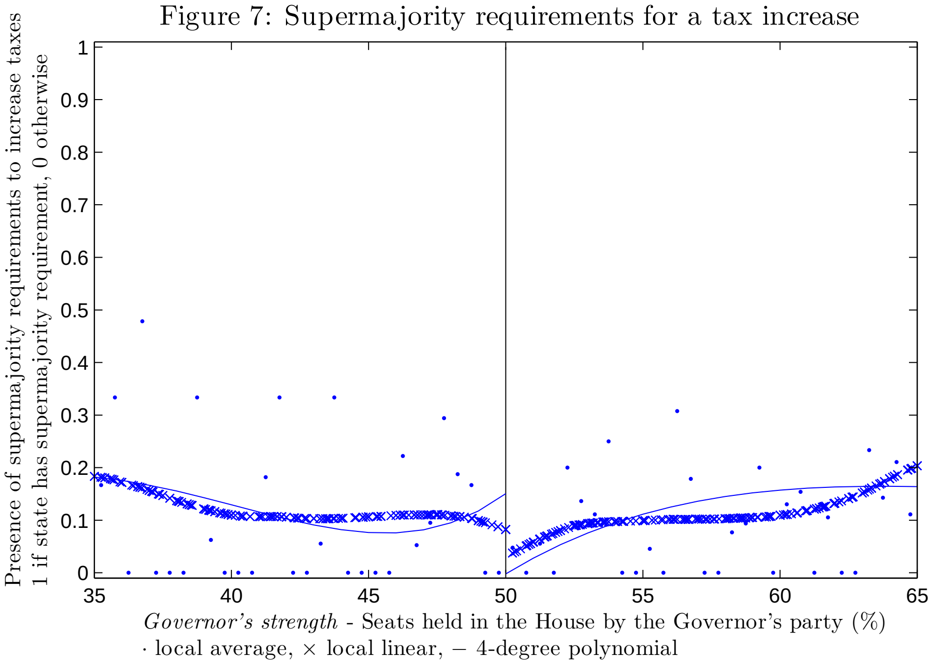


Table 7: Supermajority requirements and *Governor's strength*

Method	Jump at 50%	Robust-SE	Bootstp mean	Cluster Robust-SE
4-degree polynomials	-0.15	(0.05)***	-	(0.09)*
LLR(bandwidth 7)	-0.05	(0.04)	-0.04	(0.04)
LLR(bandwidth 15)	-0.03	(0.04)	-0.02	(0.05)

Note: This sample is comprised of 1712 observations of states with line item veto from 1960 to 2006. Each observation represents a state within a year. The dependent variable takes value 1 if the state has a supermajority requirement for a tax increase (240 observations), and 0 if otherwise. The forcing variable is *Governor's strength*, which is the percentage of seats in the state House of Representatives that belong to the same party as the Governor. The discontinuity is estimated at *Governor's strength*=50%. The first row shows the results for a four-degree polynomial on each side of the cutoff. Theoretical heteroskedastic and cluster robust standard errors by state are in parenthesis. The last two rows show the results for a local linear regression specification with a triangular kernel and different bandwidths. Theoretical heteroskedastic robust standard errors are provided together with bootstrapped cluster robust standard errors (wild bootstrap with 10,000 draws each).

6.6 Including covariates

The allocation of treatment in regression discontinuity design is regarded as random. This makes the identification of a causal effect independent of the inclusion of controls. Consequently, checking whether our main result is robust to the inclusion of covariates could be an indication of the validity of our design, as well as being a mechanism through which we can improve the precision of the estimates.

In Table 8, we separate out the different sets of covariates and also show all these controls combined in the final set of four rows. Both the inclusion of covariates and making inference on the discontinuity is straightforward when using parametric specifications. For the local linear regression specifications, we estimate a semiparametric procedure in which the covariates enter linearly, but the forcing variable *Governor's strength* enters nonparametrically[32]. We use bootstrapping to estimate standard errors in the semiparametric setting, continuing to use the wild cluster bootstrap to estimate cluster robust standard errors. In order to calculate heteroskedastic robust standard errors, we resample the residuals of the semiparametric model with replacement 10,000 times.

Our main result is robust to the inclusion of covariates, and estimates for the size of the discontinuity alter little from our original results with no controls in Table 1.

6.7 Lagged tax level

In this section, we treat the lagged tax level as another covariate and look for a discontinuity at the cutoff on the current *Governor's strength.* If treatment at each period is assigned completely at random, then we should observe no discontinuity. Yet Table 9 shows a discontinuity of similar size and as significant as the contemporaneous one in Table 1. This result is the main objection to the validity of our design, as it could imply that the treatment around the discontinuity is not being assigned completely at random.

The nature of our data itself would make us expect to find a significant discontinuity in the once-lagged tax level regressed on the current *Governor's strength.* Our forcing variable *Governor's strength* changes only every two years, while the tax level varies every year. If we lag the tax level once, the lagged tax level$(t-1)$ will be regressed on *Governor's strength*(t). For half of the observations, however, *Governor's strength*(t) is equal to *Governor's strength*$(t-1)$, because *Governor's strength* only changes every two years. So, for half of our observations we would still be running a contemporaneous regression. For this reason in Figure 8 and Table 9, we lag the tax level twice$(t-2)$, but we still find a significant discontinuity.

In principle, we only need to look at observations at the discontinuity. Due to feasibility constraints however, we must include observations away from the discontinuity as well. As our observations are far from the cutoff, assignment of treatment is less likely to be random overtime. Slim majorities of one or two competitive seats are much more likely to be overturned in an election than majorities of more seats. Once a strong divided government is in place, e.g. with *Governor's Strength*=55%, it is probable that it will last for more than two years. Therefore each observation with a divided government is likely to have had the same status during more than two preceding periods. Even if we lag the tax level twice, we are still likely to be relating the twice-lagged tax level to a divided government, albeit one with a different value of *Governor's Strength.*

Our conjecture is that if we were able to restrain our estimation to data at the cutoff, then the estimated discontinuity in the twice-lagged tax level would disappear. This conjecture, however, is not testable because there is not enough data to estimate the discontinuity with such as small

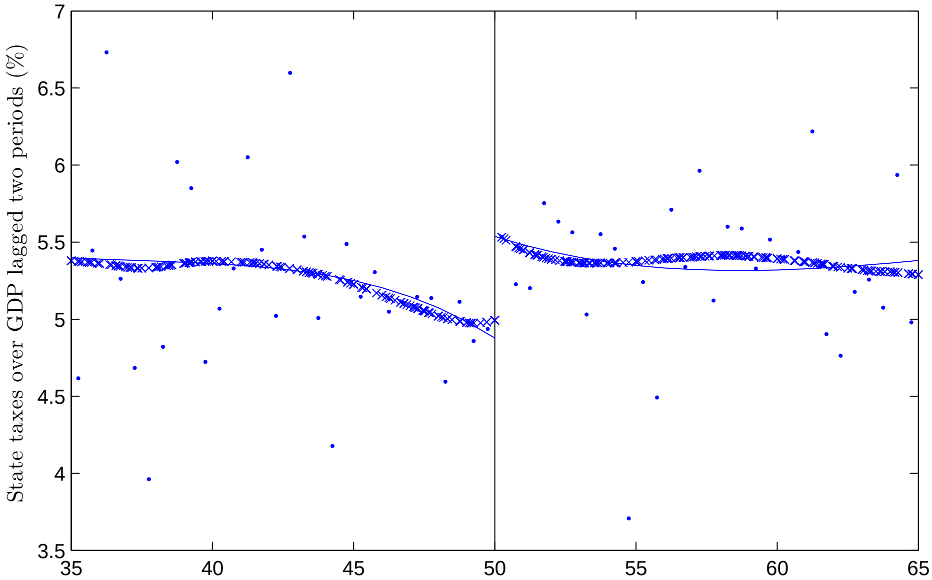
[32] For details of the procedure see the Appendix, Section C.

Table 8: State tax level, *Governor's strength*, and Controls

Method	Jump at 50%	Bootstp mean	Robust-SE	Bootstp mean	Cluster Robust-SE
Controls: dummy for Governor's party, dummy for Senate controlled by Governor's party					
4-degree polynomials	0.67	-	(0.21)**	-	(0.35)*
LLR(bandwidth 7)	0.63	0.57	(0.25)**	0.59	(0.38)
LLR(bandwidth 15)	0.39	0.36	(0.16)**	0.36	(0.23)
Controls: dummy for midterm election, turnout for last election					
4-degree polynomials	0.71	-	(0.28)***	-	(0.38)*
LLR(bandwidth 7)	0.53	0.52	(0.26)**	0.53	(0.38)
LLR(bandwidth 15)	0.36	0.31	(0.16)*	0.33	(0.23)
Controls: dummy supermajority requirements, dummy for tax limitations					
4-degree polynomials	0.69	-	(0.21)***	-	(0.33)**
LLR(bandwidth 7)	0.67	0.61	(0.26)**	0.61	(0.35)*
LLR(bandwidth 15)	0.40	0.35	(0.18) *	0.35	(0.21)*
Controls: population, income per capita, unemployment					
4-degree polynomials	0.71	-	(0.19)***	-	(0.30)**
LLR(bandwidth 7)	0.70	0.64	(0.23)***	0.64	(0.31)**
LLR(bandwidth 15)	0.42	0.37	(0.16)**	0.37	(0.19)**
Controls: All of the above					
4-degree polynomials	0.62	-	(0.18)***	-	(0.29)**
LLR(bandwidth 7)	0.61	0.59	(0.24)**	0.59	(0.32)*
LLR(bandwidth 15)	0.38	0.33	(0.15)**	0.34	(0.19)*

Note: This sample is comprised of 1712 observations of states with line item 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 forcing variable is *Governor's strength*, which is the percentage of seats in the state House of Representatives that belong to the same party as the Governor. The discontinuity is estimated at *Governor's strength*=50%. For each set of results, different linear controls are used. The first row in each set shows the results for a four-degree polynomial on each side of the cutoff. Theoretical heteroskedastic and cluster robust standard errors by state are in parenthesis. The last two rows in each set show the results for a local linear regression specification with a triangular kernel and different bandwidths. Theoretical heteroskedastic robust standard errors are provided together with bootstrapped cluster robust standard errors (wild bootstrap with 10,000 draws each).

Figure 8: State tax level lagged two periods and *Governor's strength*



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

Table 9: Lagged state tax level and *Governor's strength*

Method	Jump at 50%	Robust-SE	Bootstp mean	Cluster Robust-SE
Dep. var. State taxes over GDP lagged once				
4-degree polynomials	0.71	(0.21)***	-	(0.35)*
LLR(bandwidth 7)	0.64	(0.21)***	0.59	(0.34)*
LLR(bandwidth 15)	0.44	(0.15)***	0.40	(0.21)*
Dep. var. State taxes over GDP lagged twice				
4-degree polynomials	0.66	(0.21)***	-	(0.35)*
LLR(bandwidth 7)	0.55	(0.22)***	0.52	(0.32)
LLR(bandwidth 15)	0.41	(0.15)***	0.38	(0.20)*

Note: This sample is comprised of state-years with line item veto from 1960 to 2006. There are 1678 observations for the lagged-once set of regressions and 1644 observations for the lagged-twice set. The dependent variable is the total sum of a state's income, sales, and corporate taxes divided by state GDP, lagged once for the first set of regressions, and lagged twice for the second set. The forcing variable is *Governor's strength*, which is the percentage of seats in the state House of Representatives that belong to the same party as the Governor. The discontinuity is estimated at *Governor's strength*=50%. In each set of regressions, the first row shows the results for a four-degree polynomial on each side of the cutoff. Theoretical heteroskedastic and cluster robust standard errors by states are in parenthesis. The last two rows show the results for a local linear regression specification with a triangular kernel and with different bandwidths. Theoretical heteroskedastic robust standard errors are provided together with bootstrapped cluster robust standard errors (wild bootstrap with 10,000 draws each).

bandwidth reliably. In Table 10, we show how the estimation of the discontinuity with the current tax level, and the estimation of the discontinuity with the twice-lagged tax level are sensitive to restricting the bandwidth to data very close to the cutoff.

We can see in Table 10 that the estimated discontinuity on the the twice-lagged tax level only becomes significant when using a bandwidth of 4 or higher, whereas the estimated discontinuity on the current tax level becomes significant with a bandwidth of 3 or higher. Moreover, the estimated discontinuity on the the twice-lagged tax level is never significant when allowing for clustering by state in the error term. Whereas the estimated discontinuity on the current tax level becomes significant when allowing for clustering by state in the error term with a bandwidth of 4 or higher. We see this comparison as an indication that our conjecture may hold and therefore, do not see the results in Table 9 and Figure 8 as a threat to the validity of our design[33].

Table 10: Tax level and lagged tax level on *Governor's strength* - different bandwidths

Method	Jump at 50%	Robust-SE	Bootstp mean	Cluster Robust-SE
Current tax level on current *Governor's strength*				
LLR(bandwidth 1)	0.76	(0.53)	0.74	(0.68)
LLR(bandwidth 2)	0.71	(0.45)	0.64	(0.53)
LLR(bandwidth 3)	0.61	(0.35)*	0.65	(0.40)
LLR(bandwidth 4)	0.67	(0.30)**	0.68	(0.37)*
LLR(bandwidth 5)	0.69	(0.27)**	0.69	(0.37)*
LLR(bandwidth 6)	0.68	(0.25)***	0.64	(0.38)*
LLR(bandwidth 7)	0.66	(0.23)***	0.60	(0.36)*
Tax level lagged twice on current *Governor's strength*				
LLR(bandwidth 1)	0.63	(0.43)	0.57	(0.63)
LLR(bandwidth 2)	0.45	(0.35)	0.41	(0.47)
LLR(bandwidth 3)	0.43	(0.30)	0.47	(0.38)
LLR(bandwidth 4)	0.50	(0.28)*	0.51	(0.35)
LLR(bandwidth 5)	0.52	(0.26)**	0.55	(0.34)
LLR(bandwidth 6)	0.57	(0.23)***	0.54	(0.33)
LLR(bandwidth 7)	0.55	(0.22)***	0.52	(0.32)

Note: This sample is comprised of state-years with line item veto from 1960 to 2006. There are 1644 observations for the set of regressions using the tax level lagged twice, and 1712 observations for the set of regressions using the current tax level. The dependent variable is the total sum of a state's income, sales, and corporate taxes divided by state GDP, current for the first set and twice-lagged for the second set of regressions. The forcing variable is *Governor's strength*, which is the percentage of seats in the state House of Representatives that belong to the same party as the Governor. The discontinuity is estimated at *Governor's strength*=50%. Each row shows the results for a local linear regression specification with a triangular kernel and with different bandwidths. Theoretical heteroskedastic robust standard errors are provided together with bootstrapped cluster robust standard errors (wild bootstrap with 10,000 draws each).

[33]Other papers have looked explicitly at the dynamic nature of similar data, albeit not by using regression discontinuity design. Alt and Lowry (1994) and Poterba (1994) are interested in how governments respond to recession driven deficits. Their findings are that unified governments tend to respond faster and to be more dependent on tax increases than on expenditure cuts.

7 Concluding remarks

Close elections and slim majorities are good examples of a quasi-random assignment of treatment. The political economy literature has a lot to gain from using regression discontinuity design. An example of this is that we found that the partisan identity of the Legislature's majority party does not seem to have a causal effect on the tax level. Instead, it is the alignment between the Governor and the Legislature's majority, independent of party identity, that drives the discontinuity in the tax level.

Our model describes the budget in the states that have block veto as a take-it-or-leave-it offer made by the Legislature. Since the Governor finds the outside option too costly, the Legislature can approve whichever budget and whatever tax level it wants, completely independent of the Governor. In particular, the Legislature uses any increase in tax revenues to target transfers to its supporters. The Legislature is the residual claimant of a tax increase and therefore, it has every interest in increasing the tax level.

In states with line item veto, the budget is not a take-it-or-leave-it offer. Once the budget has been approved by the Legislature, the Governor can trim the budget and even cut entire items. The 'sting' of the line item veto is to enable the Governor to cut the budget whenever he deems it appropriate. Having said that, the Governor will only do this, if his interests are not aligned with those of the Legislature. When the interests are not aligned, the Legislature cannot use an increase in tax revenues to target transfers to its supporters. The Legislature is not the residual claimant of a tax increase, and therefore there is no point in increasing the tax level. The budgetary separation of powers is only effective when the agent proposing the tax level (the Legislature) is not the residual claimant of a tax increase.

Two empirical findings corroborate our theoretical model. Firstly, in states with line item veto, we identify a statistically significant discontinuous rise of 13% in the tax level, when there is a switch from a divided to an aligned government. Secondly, in states with block veto, we find no discontinuity when the government switches from divided to aligned.

We have chosen a static approach for both our modeling and empirical strategy. This approach facilitates a straightforward adaptation of the regression discontinuity design method to our data. A next step in this line of research would be to model the time structure within our data set and allow for path dependence of some of our variables.

In this paper, we have focused on a novel way to look for discontinuities in variables that relate to political control in states, countries, or other polities with a separation of powers. When looking for the effects of political control on fiscal or policy variables, our results suggest that focusing on discontinuous changes in the degree of alignment between powers, such as a switch from divided to aligned government, could be as important as looking for discontinuous changes in party control over agenda setting powers. This approach has the potential to shed light on how the composition of state spending varies, on how transfer from the federal government may be affected, on how the composition of taxation changes, and we hope, on other policy relevant questions.

A Robustness check

A.1 Excluding decades

Table 11: Tax level and *Governor's strength*. Four degree polynomial specification on each side of the cutoff, excluding one decade at a time

Excluded decade	Jump at 50%	Cluster Robust-SE
60's	0.69	(0.33)**
70's	0.71	(0.39)*
80's	0.79	(0.39)*
90's	0.69	(0.40)*
00's	0.64	(0.37)*

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

A.2 Excluding one state at a time

Table 12: Tax level and *Governor's strength*. Four degree polynomial specification on each side of the cutoff, excluding one state at a time

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

Note: This sample is comprised of state-years with line item veto from 1960 to 2006. Each regression is run with 1665 observations. The exceptions are: CT with 1669 observations, as Connecticut had fours years with an independent Governor dropped; IA, WA, WV each with 1674 observations, as they adopted the line item veto in 1969. The dependent variable is the percentage of the sum of income, sales, and corporate taxes in a state divided by state GDP and shown as a percentage. The forcing variable is *Governor's strength*, the percentage of seats in the state House of Representatives that belong to the same party as the Governor. The discontinuity is estimated at *Governor's strength*=50%. In each entry we exclude from the sample the state in columns 1 or 3. Each row shows the results for a four-degree polynomial on each side of the cutoff. Theoretical cluster robust standard errors by state are in parenthesis.

A.2.1 Including Minnesota

Minnesota is an outlier in many ways. Firstly, until 1972 Minnesota had an officially non-partisan Legislature. We therefore, do not have data on *Governor's strength* for Minnesota before 1973.

Secondly, from 1982 to 1998, Minnesota's Governors were not the candidates chosen by their own parties in the primaries. Democrat Rudy Perpich entered and won the race for Governor in 1981 running directly against the Democratic candidate chosen in the primaries. Republican Arne Carson lost in all but one of the 87 state-district primaries, but his name was replaced in the ballot after a scandal forced the chosen Republican candidate to step down, and he became Governor in 1989 (for a detailed account of contemporary Minnesota political history see Brandl (2000)). Since our model depends on the alignment of interests between Governor and the Governor's party in the Legislature, we have decided to treat these Governors as independents and have excluded them from the data. We did the same with Jesse Ventura, who was the independent Governor of the State from 1999 to 2002. After all these exclusion we thought best to drop Minnesota completely.

The third reason why Minnesota is an outlier in our data is that it has the highest average tax revenue in our sample, i.e. 7.89%, compared to an average across the sample of 5.4%.

Nevertheless we could, in practice, include the data from Minnesota from 1972 to 1998 and from 2003 to 2006. There are many observations around the cutoff and with such high average taxes the inclusion of these outliers make our results less stable, as we can see in Table 13.

Table 13: Tax level and *Governor's strength*-Including Minnesota

Method	Jump at 50%	Robust-SE	Bootstp mean	Cluster robust-SE
4-degree polynomials	0.42	(0.23)**	-	(0.42)
LLR(bandwidth 7)	0.53	(0.25)**	0.43	(0.39)
LLR(bandwidth 15)	0.23	(0.16)	0.22	(0.27)

Note: This sample is comprised of 1741 observations of states with line item 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 forcing variable is *Governor's strength*, which is the percentage of seats in the state House of Representatives that belong to the same party as the Governor. The discontinuity is estimated at *Governor's strength*=50%. The first row shows the results for a four-degree polynomial on each side of the cutoff. Theoretical heteroskedastic and cluster robust standard errors by state are in parenthesis. The last two rows show the results for a local linear regression specification with a triangular kernel and different bandwidths. Theoretical heteroskedastic robust standard errors are provided together with bootstrapped cluster robust standard errors (wild bootstrap with 10,000 draws each).

A.3 Uniqueness of discontinuity

Table 14: Tax level and *Governor's strength* - quartic-polynomial specification, alternative cutoff points

Cutoff point	Jump	Robust-SE	Cluster robust-SE
45%	0.29	(0.76)	(1.22)
46%	0.36	(0.68)	(0.81)
47%	0.27	(0.44)	(0.66)
48%	0.00	(0.30)	(0.37)
49%	0.35	(0.25)	(0.36)
50%	0.69	(0.21)***	(0.35)*
51%	0.35	(0.22)	(0.42)
52%	0.36	(0.27)	(0.34)
53%	0.27	(0.30)	(0.51)
54%	0.34	(0.44)	(0.80)
55%	0.66	(0.54)	(0.96)

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

A.4 Alternative measure: state taxes per capita

Table 15: Taxes per capita and *Governor's strength*

Method	Jump at 50%	Robust-SE	Bootstp mean	Cluster robust-SE
4-degree polynomials	92.2	(46.3)**	-	(69.7)
LLR(bandwidth 7)	143.8	(50.8)***	116.4	(64.1)*
LLR(bandwidth 15)	61.2	(33.8)*	58.7	(43.5)
LLR(bandwidth 16)	62.2	(32.7)*	59.6	(42.3)

Note: This sample is comprised of 1712 observations of states with line item 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 per capita in 1982-dollars. The forcing variable is *Governor's strength*, which is the percentage of seats in the state House of Representatives that belong to the same party as the Governor. The discontinuity is estimated at *Governor's strength*=50%. The first row shows the results for a four-degree polynomial on each side of the cutoff. Theoretical heteroskedastic and cluster robust standard errors by state are in parenthesis. The last two rows show the results for a local linear regression specification with a triangular kernel and different bandwidths. Theoretical heteroskedastic robust standard errors are provided together with bootstrapped cluster robust standard errors (wild bootstrap with 10,000 draws each).

B Excluding observations with supermajority requirements

Table 16: Tax level and *Governor's strength*- observations with supermajority requirement excluded

Method	Jump at 50%	Robust-SE	Bootstp mean	Cluster Robust-SE
4-degree polynomials	0.81	(0.23)***	-	(0.40)**
LLR(bandwidth 7)	0.74	(0.24)***	0.65	(0.39)*
LLR(bandwidth 15)	0.43	(0.16)***	0.37	(0.24)

Note: This sample is comprised of 1472 observations of states with line item veto from 1960 to 2006. Each observation represents a state within a year. We have excluded the observations with supermajority requirements for a tax increase. The dependent variable is the total sum of a state's income, sales, and corporate taxes divided by the state GDP as a percentage for that year. The forcing variable is *Governor's strength*, which is the percentage of seats in the state House of Representatives that belong to the same party as the Governor. The discontinuity is estimated at *Governor's strength*=50%. The first row shows the results for a four-degree polynomial on each side of the cutoff. Theoretical heteroskedastic and cluster robust standard errors by state are in parenthesis. The last two rows show the results for a local linear regression specification with a triangular kernel and different bandwidths. Theoretical heteroskedastic robust standard errors are provided together with bootstrapped cluster robust standard errors (wild bootstrap with 10,000 draws each).

C Semiparametric procedure

We implement a semiparametric estimation similar to that presented Robinson (1988)[34]. In this procedure he proposes, one of the covariates enters the model nonlinearly. The model is estimated without the need of making parametric assumptions on the shape of the nonlinear relation. We reproduce his procedure with the exception that we allow for a discontinuity at the cutoff at the stage in which the the function is estimated nonparametrically.

The model we are estimating is:

$$tax\ level_{st} = X'\beta + f(g_{st}) + \epsilon_{st},$$

where X is the matrix with the covariates. The function $f(g_{st})$ is the non-linear part of the model, and $g =$*Governor's strength*.

The first step is to estimate the correlation between g and all the other variables. We estimate each correlation non parametrically with a local linear regression.

The βs are estimated by the following OLS regression:

$$\hat{\beta} = (\overline{X}'\overline{X})^{-1}\overline{X}'\overline{\tau},$$

where each column of the matrix $\overline{X}$ is the fitted errors of the local linear regression of each column of X on g. The vector $\overline{\tau}$ is the fitted errors of a local linear regression of *tax level* on g.

Once we have the $\hat{\beta}$s we retrieve the fitted errors:

$$\overline{tax\ level} = ttax\_GDPp - X'\hat{\beta}.$$

The shape of $f(g)$ is identified by running another local linear regression of $\overline{tax\ level}$ on *Governor's strength*. But since we are allowing for a discontinuity, we estimate one for *Governor's strength*≤ 0.5, and one for *Governor's strength*> 0.5.

[34]For a summary of the procedure and applications, see also Ichimura and Todd (2006).

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