Political Parties and the Tax Level in the American states: Two Regression Discontinuity Designs

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Political Parties and the Tax Level in the American states: Two Regression Discontinuity Designs *†

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Abstract

Our first regression discontinuity design shows that whether the majority in the House of Representatives is Republican or Democratic does not affect the tax level. This result goes against recent findings in the political economy literature. In another regression discontinuity design, we find that taxes are higher when governments are unified (both the Governor and the majority in the state House belong to the same party) than when they are divided. Another contribution of the paper is to investigate under which conditions slim majorities (as opposed to close election) are appropriate for a regression discontinuity design. (*JEL* D72, H71, R5)

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If parties play a role in policy making, one would expect their influence over policy to be related to the number of seats they hold in the state House and Senate, and the party identity of the Governor. In particular, voting rules in the Legislatures make it such that a party's influence should change discontinuously once it has the required majority to pass or block bills. In most Legislatures, a party with 50%+1 of the seats in either chamber has the power to both propose, modify, and block the budget, and also to propose and block changes to the tax level. This discontinuous change in party influence allows us to use a regression discontinuity design to try to identify whether there is a causal link between the majority in the Legislature and the state tax level.

The general idea of a regression discontinuity design in a political setting is that *close elections* can be regarded as random (see Lee (2008)). We propose that *slim majorities* in the state lower House can be regarded as random.[1] Since we are focusing on slim majorities instead of vote count, our design must pass an important test. For a slim majority of one seat to be considered as random, at least one seat out of all the seats won by the majority must have been won in a close election. If this is the case, the party identity of the majority itself can be considered as random as a close election. On the other hand, if every seat was won by a landslide majority, even an election result that delivers a majority of 50%+1 could not be considered as random. We have electoral return data at the state-district level and show in Section 2.2 that slim majorities of one or two seats do satisfy the condition of having at least one or two close district-level elections. Section 2.2 is a contribution on its own because it allows future research to use slim majorities in the states' Houses to identify other causal relations of interest.

Under the identifying assumption that slim majorities can be considered as random, we can therefore check whether there is a discontinuous increase in the tax level at the

[1] Every state's Legislature (except for that of Nebraska) has two legislative chambers: a state Senate and a state House. The Senate also plays an important role in writing and approving the budget, but, as we discuss below in Section 1.3, only the state House lends itself to a regression discontinuity design.

cutoff *Democratic control* = 50%. We define *Democratic control* as the percentage of seats held by the Democratic party in the state lower House. Above the cutoff, the Democrats have the majority in the state House; below the cutoff, the Republicans have the majority. If we observe a jump in the tax level at the 50% cutoff, we can assign the higher tax level to the Democrats holding the majority, and therefore interpret the jump as a causal relationship. The identifying assumption implies that all confounding factors, observable and unobservable, should on average be the same on both sides of the 50% cutoff, so that the difference in the outcome variable can only be attributed to the treatment effect. An interesting feature of the design is that we can test for discontinuities in observable covariates as a way to check whether our "randomization" has worked well. The limitation of such a design is that we are only able to identify a causal relation locally, at the 50% cutoff. The result is not generalizable to all the support.

We find two important results with our regression discontinuity designs. The first is that we find no discontinuity in the state tax level at the cutoff *Democratic control* = 50%. We describe this result in Section 3. The tests we perform indicate that our result is robust and valid as a quasi-experiment. We therefore interpret this result as evidence against a causal relationship between the partisan identity of the majority in the state House and the tax level. This result is in contrast with recent results in the political economy literature (see Besley and Case (2003) and Reed (2006)).[2]

On one hand, our first result is in line with what Ferreira and Gyourko (2009) find when studying U.S. cities. They also use a regression discontinuity design and find no evidence that the partisan identity of the Mayor has an effect on government size. On the other hand,

[2] Besley and Case (2003) find that the higher the fraction of seats held by the Democratic party in the state lower House, the higher the contemporaneous tax level. Their multivariate regression analysis includes state and year fixed effects and time-varying state level controls. Reed (2006) also controls for state and time fixed-effects but regresses five-year changes in the tax level on state characteristics and variables indicating political control. He finds that Democratic control over the Legislature, measured as the fraction of the five-year period in which Democrats controlled both state chambers, has a positive impact on the tax level.

our first result differs from what Pettersson-Lidbom (2008) finds for Sweden. He looks at the effects of the partisan control of the local legislative and find that left-leaning governments do spend more.

One of the contributions of this paper is that instead of focusing exclusively on either the legislative or the executive branch of government, we use regression discontinuity design to investigate how the alignment between branches influences the size of government[3].

We still use the identifying assumption that slim majorities can be regarded as random, but we now look at whether this "randomization" delivered an unified or a divided government. In order to measure the degree of alignment between the Governor and the state House, we use as our forcing variable the *Governor's strength*, which we define as the percentage of seats in the state House of Representatives that belong to the same party as the current Governor, whether they be Democrat or Republican. Above the 50% cutoff, the government is unified; below the cutoff, the government is divided.

The recent literature has found little evidence that the Governor's partisan identity has an effect on the tax level.[4] The Governor, however, plays an important role in setting the budget. In many states, for example, the Governor's office, or an independent agency usually linked to the office, prepares the first draft of the budget. This agenda-setting power may have some influence over the budget. Moreover, most Governors have more power over the state budget than the President has over the federal budget. This is the case because in most states the Governor may veto particular lines, items, or 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 (and a minority of Governors) has over a budget

[3]Other papers such as Egger and Koethenbuerger (2010) use regression discontinuity design to investigate the effect of council size on government expenditure.

[4]Besley and Case (2003), Reed (2006), and Leigh (2008) find no evidence that the party identity of the Governor affects the tax level. Besley and Case (1995) find evidence that a Governor facing term limits increases the tax level, but their result is not robust to extending the data set in time, as they do in Besley and Case (2003).

approved by Congress. The President only has the power to veto the federal budget as a block.

The second 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.[5] We present this result in Section 4.1. In Section 4.2 we present the result that there is no discontinuity in the tax level in the sample of states with the block veto.

In Section 1 we present the data. In Section 2 we discuss the design and our estimation methods. In Section 3 and Section 4 we present the results of our two regression discontinuity designs. We discuss our results in Section 5. Our interpretation of these results is that parties do matter, but not in the way we tend to think of them: big government Democrats and small government Republicans.

1 Data

Our full sample comprises 50 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).[6] We have updated their sample from 1960 to 1998 with data from 1999 to 2006. The source of the new data was the Census Bureau, Legislature websites, the website for the National Association of State Budget Offices (NASBO), and the website for the National Conference of State

[5]Two papers closely related to our second result are those of Holtz-Eakin (1988) and Besley and Case (2003). Holtz-Eakin (1988) uses a panel from 1966 to 1983 and runs 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, for both Democratic and Republican Governors. Besley and Case (2003) have a longer data set, from 1960 to 1998, and interact a dummy for the line item veto with a dummy for divided government (they also control for state and year effect). In their estimates, a divided government in a state with the line item veto is negatively correlated with tax revenues per capita. See also Poterba (1994) and Alt and Lowry (1994) for a panel analysis of the role of divided government and other institutional features on the American states.

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

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 17 observations with independent Governors. We exclude Minnesota because until 1972 it had a non-partisan Legislature and its Governors were either officially independent from 1982 to 2002 or are classified as such by Brandl (2000).[7] 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 at $66.\overline{6}\%$ of the seats in each chamber in the Legislature, and there is not enough data to reliably reproduce our estimation procedure at this cutoff. Our working sample has 43 states from 1960 to 2006: 2004 observations (not 2021 because independent Governors are excluded).

In our sample, the average tax level in the American states is around 5% of GDP. The tax level is defined as the sum of state income, sales, and corporate taxes divided by state GDP. We also have data on total state expenditure, which averages at 10% of GDP. Much of this expenditure is determined by Federal transfers and local programs, which are under the control of neither the state Legislature nor the Governor. We will abstain from discussing the role that the Federal and local governments have in state fiscal policy.[8]. Instead we focus solely on tax revenue from state taxes.

We also show results with an alternative measure for the tax level: state taxes per capita. However, taxes per capita seem to be more time dependent than tax revenues over GDP. This can be seen in Table 1. The average taxes per capita across states in 1982-dollars during the 1960s is $354. This jumps to $560 in the 1970s and continues to increase thereafter. Taxes

[7] 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. Jesse Ventura was the independent Governor from 1999 to 2002. For a detailed account of contemporary Minnesota political history, see Brandl (2000)).

[8] 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).

over GDP are much more stable across the same period. We choose taxes over GDP as our preferred dependent variable because it is potentially less vulnerable to outliers from the 1960s and to comparisons of estimates from observations of different decades. Even when using taxes over GDP, however, the 1960s is an outlier decade. Because of this, one of our robustness checks is to estimate our results excluding this period.

Table 1: Different measures of the states' tax level

Measure	1960s	1970s	1980s	1990s	2000s
state taxes per capita (1982-dollars)	334	572	646	811	900
state taxes over state GDP (%)	4.4	5.7	5.6	5.8	5.6

Note: This sample comprises 2004 observations of states with the line item veto and states with the block veto from 1960 to 2006. Each observation represents a state within a year. The tax level is measured as the total sum of a state's income, sales, and corporate taxes. Each entry is the average of all observations within a decade.

Table 2: Political parties and the adoption of income and/or corporate taxes

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

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

An alternative measure to tax revenues over GDP or per capita would be to look at the tax rates themselves. We do not have data on the changes in the tax rates, so we cannot follow such a strategy. We do have data on tax revenues, however. So if the revenue of a certain tax goes from zero to a positive number from one year to the next, this means a new tax has been adopted. As can be seen in Table 2, out of the eleven states that adopted either income alone or both income and corporate taxes in the period 1960 to 2006, five had a Democratic majority in the state House and six had a Republican majority in the state House. Also note that out of the seven states with the line item veto, six adopted the new taxes under an unified government. Out of the four states with the block veto, two adopted new taxes under an unified government and two under a divided government. The adoption of new taxes by different government configurations seems to be in line with the econometric results that we present in Sections 3.1, 4.1, and 4.2.

As we mentioned in the Introduction, we expect the effect of the House being unified with or in opposition to the Governor to be more evident in the states with the line item veto. We therefore split our sample between states with the line item veto and states with the block veto. Our sample has 34 states with the line item veto throughout the period 1960 to 2006. There are five states that have the block veto throughout as well: Indiana, North Carolina, New Hampshire, Nevada, and Vermont. And there are four states that adopted the line item veto during our sample period: Iowa, Washington, Virginia, and Maine.[9] The four states that changed status appear on the block veto subsample up to their adoption of the line item veto, and then they appear on the line item veto subsample. In the cases in which our forcing variable is *Democratic control*, there is no reason *a priori* to split the sample according to the differences in veto power, so we provide results for the combined sample as well.

We also have 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;

[9]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. (2003).

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. We follow standard practice and check these covariates for significant discontinuities around $Democratic\ control = 50\%$ and $Governor's\ strength = 50\%$.

Finally, we have data on state legislative election returns at the state district level from 1967 to 2003. These were provided by the ICPSR (Inter-University Consortium for Political and Social Research) and collected and organized by Carsey et al. (2008). We were unable to find state-district level data for the remaining years of our working sample. Also, as Carsey et al. (2008) point out, due to various reasons, there is about 18% of missing values for the variable that we are interested in: the margin of victory, defined as the difference between the percentage of the votes that the winner received and the percentage of the vote that the second-place candidate received in each state district. We end up with state-district level data for 714 state-years.[10]

2 Regression discontinuity design

2.1 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.[11] 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

[10]Our working sample (with both the states with the line item veto and the states with the block veto) has 2004 observations. An observation is a state in a year. Elections, however, only take place every two years, so we only have election results for 1002 observations. This number is the basis for a comparison with the number of observations for which we have state-district election returns data: 714.

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

discontinuous. [12] The main identifying assumption of the design is that the relation between any confounding factor and g must be continuous at the cutoff 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 the outcome variable is identified as being caused only by the variation 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 either *Democratic control* or *Governor's strength*, and the outcome variable is the state tax level. If the forcing variable is above 50%, the observation receives treatment. In the first design, the treatment is a Democratic controlled state House. In the second design, the treatment is an "unified government". At each period, a state is either assigned the treatment or not. For the observations in which the election for the state House delivered a slim majority, we argue that the assignment of treatment was as good as random. If this is the case, differences in the average tax level between the treated group and the control group are an estimation of the treatment effect.

2.2 Slim Majorities and Close Elections

Our regression discontinuity designs are based on the idea that slim majorities in state Legislatures can be interpreted as randomly assigned. The party identity of the majority in a Legislature, however, is not chosen in a single state-wide district in which the party with 50% +1 of the votes wins the majority. Instead, each state is divided into state-districts that choose a representative to the state Legislature by a first-past-the-post system.[13] Therefore,

[12] 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. In sharp design, treatment is known to depend in a deterministic way on some observed variables. In fuzzy design, there are also unmeasured factors that affect selection into treatment. Our case fits the sharp design.

[13] Some states have multi-member districts. We include in our data used in Table 3 and 4 the multi-member districts that have different candidates for each post. We exclude from our data the free-for-all multi-member districts, in which all candidates run together and those with the most votes win a seat.

an important condition for a slim majority to be considered random is that at least a few state-districts must have had close elections themselves.

The benchmark case is a legislative election in which each party has the same number of secure seats, only one seat is competitive. Whichever party wins that seat, wins the majority in the legislative chamber. If that seat was decided in a close election, then the assignment of which party holds the majority in the legislative chamber is as random as the election for the competitive seat itself. Lee (2008) discusses why close elections can be considered as random and are therefore appropriate for regression discontinuity designs. The rule-of-thumb definition of a close election by Lee (2008) is an election in which the margin of victory was less than 5% of the votes in a particular district.

In Table 3, row 1 we look at legislative elections that delivered majorities - for either Democrats or Republicans - of 1% of the seats (the average state House has 110 seats). In this interval, we have state-district level data for 33 election years in different states. In each of these legislative elections, we counted the number of seats that were won with a margin of victory of less than 5% of the votes. In all of these 33 legislative elections at least 1% of the seats were decided by close elections. The results in row 1 indicate that slim majorities of one or two seats can be regarded as random insofar as the district level election in the competitive seats can be regarded as random. This implies that the exercise of using slim majorities for a regression discontinuity design is a valid one. For majorities of one or two seats, there seems always to be enough close election to make the result of which party gains the majority random itself.

The other rows in Table 3 show what happens if we look at majorities of more seats. As an example, let's look at a majority of, say, 53% of the seats. If at least 3% of all seats were the result of close district-level elections, then we say that the identity of the majority in that election satisfies our randomness condition. Out of the 86 observations in that interval, 83% satisfy the condition. Note also that our condition implies that the winner of the majority

Table 3: Randomness condition for the state House

Democratic control (%)	Percentage of seats that must be close elections	Number of observations	Randomness condition (% of obs. in the interval)
49-51	1	33	100
48-52	2	59	93
47-53	3	86	83
46-54	4	117	73
45-55	5	132	67
44-56	6	161	59
43-57	7	203	53

Note: The data on election results by state district has been provided by Carsey et al. (2008). We have election results by state district for 726 state-years. Election returns at the state-district level are only available from 1967 to 2003, and within this periods there is about 18% of missing values. *Democratic control* is defined as the percentage of seats in the state House of Representatives that belong to the Democrats. We define the randomness condition for a majority in the state House to be that at least the percentage of seats above the 50% cutoff were close elections themselves at the state-district level. We define a close election to be an election won with a margin of victory of less than 5% of the votes. Column 4 indicates the percentage of the observations in that interval that satisfy the condition. Let's use row 2 as an example. In 93% of the 59 observations with a majority of up to 52% of the seats (Democratic or Republican) at least 2% of the district-level elections for state House representative had a margin of victory below 5% of the votes.

was uncertain. Our condition does not imply that the probability of gaining the majority is the same for both parties. If, for example, the Democrats are sure to win half of the seats by a landslide, they only need one of the close-election seats to go their way, whereas the Republicans would need all close-election seats to go their way.

Had we enough data, the simplest way to implement a regression discontinuity design would be to look at the difference between the average tax rate for the observations with *Democratic control* in the interval (50%, 51%] and with *Democratic control* in the interval (49%, 50%]. As we describe below in Section 2.4, we do present the results of this simple average estimation. The sample in this interval is small, however, and the estimation of the averages are subject to a large degree of sampling variability. In order to efficiently estimate the discontinuity at the 50% cutoff, we must include observations farther from the cutoff. This may seem restrictive, but it is a common feature of any regression discontinuity design. The design only claims to identify causality in the limit, at the cutoff. But in practice, observations that are not at the cutoff are also included in the estimation. We discuss our estimation procedures in Section 2.4 below.

Table 4: Randomness condition for the state Senate

Democratic control in the Senate(%)	Percentage of seats that must be close elections	Number of observations	Randomness condition (% of obs. in the interval)
49-51	1	19	89
48-52	2	46	86
47-53	3	73	79
46-54	4	94	71
45-55	5	130	61
44-56	6	149	56
43-57	7	176	51

Note: The data on election results by state district has been provided by Carsey et al. (2008). We have election results by state senate districts for 679 state-years. Election returns at the state-district level are only available from 1967 to 2003, and within this periods there is about 18% of missing values. *Democratic control in the Senate* is defined as the percentage of seats in the state Senate that belong to the Democrats. We define the randomness condition for a majority in the state House to be that at least the percentage of seats above the 50% cutoff were close elections themselves at the state-district level. We define a close election to be an election won with a margin of victory of less than 5% of the votes. Column 4 indicates the percentage of the observations in that interval that satisfy the condition. Let's use row 2 as an example. In 86% of the 46 observations with a majority of up to 52% of the seats (Democratic or Republican) at least 2% of the state Senate elections had a margin of victory below 5% of the votes.

Our randomness condition is defined according to an arbitrary threshold that defines as close an election won by a margin of victory below 5% of the votes. Different thresholds would imply different values for column 4 in Table 3. The broad picture would remain the same, however. Slim majorities of a few seats can more easily be considered as the result of a random process than majorities of many seats.

For any given "randomness condition", one could estimate the discontinuity with the methods described in Section 2.4 by restricting the sample to observations that satisfy the condition. We have experimented with this alternative. We have estimated the discontinuities in this paper with the restricted sample that satisfies our randomness condition. The significance and direction of the results do not change. We have therefore omitted them here. They are available on request.

In Table 4 we look at the state Senates instead. Even in row 1, we observe elections that do not satisfy the randomness condition. A possible explanation for this difference between the state Senates and Houses is the sheer number of seats. The state Houses have many more seats up for election in any given electoral year than the state Senates. The state Houses have an average of 110 seats and all seats are contested every two years. The state Senates have an average of 40 seats and staggered elections, and only half of the seats are contested at each biennial election. It is easier for all of the seats in a particular election for the state Senate to have predictable results.

2.3 Forcing Variables

As we showed in the previous section, some slim majorities do not satisfy the randomness condition. This is particularly a problem for the state Senates. If the party identity of the majority is not random at the cutoff, this implies that voters can manipulate our forcing variable even at the cutoff. To test for this, we look at the the density of our potential forcing variables and check how they behave around the 50% cutoff.

Figures 1 and 2 (particulary Figure 1) suggest that voters are able to manipulate the composition of the Senate. In Figure 1 we can see that there are almost 50% more observations immediately to the left of the cutoff compared with the number of observations immediately to the right. This seems to suggest that voters are able to prevent slim Democratic majorities from controlling the state Senate. And if the voters are able to manipulate the composition of the state Senate at the 50% cutoff, we cannot interpret slim majorities in the Senate as random. Figure 2 shows a less stark but similar picture.

In Figure 3 we can see that there is almost no difference between the number of observations in a Democratic controlled House and a Republican controlled House at the 50% cutoff. In Figure 4 we have similar results. In particular, the number of observations with a

Figure 1: Histogram of forcing variable - *Democratic control in the Senate*

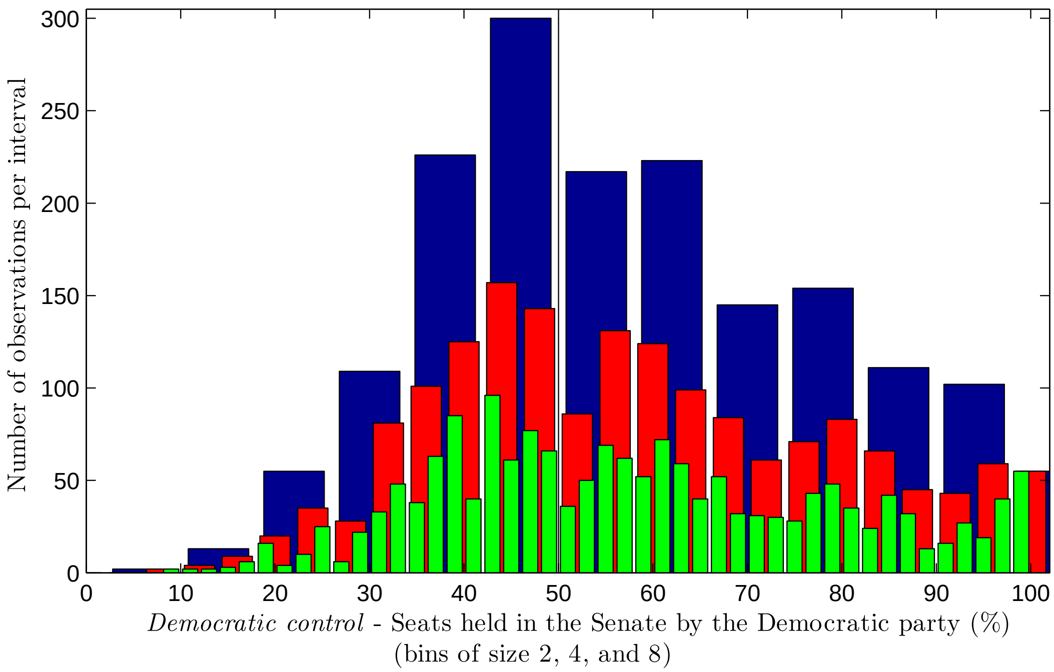
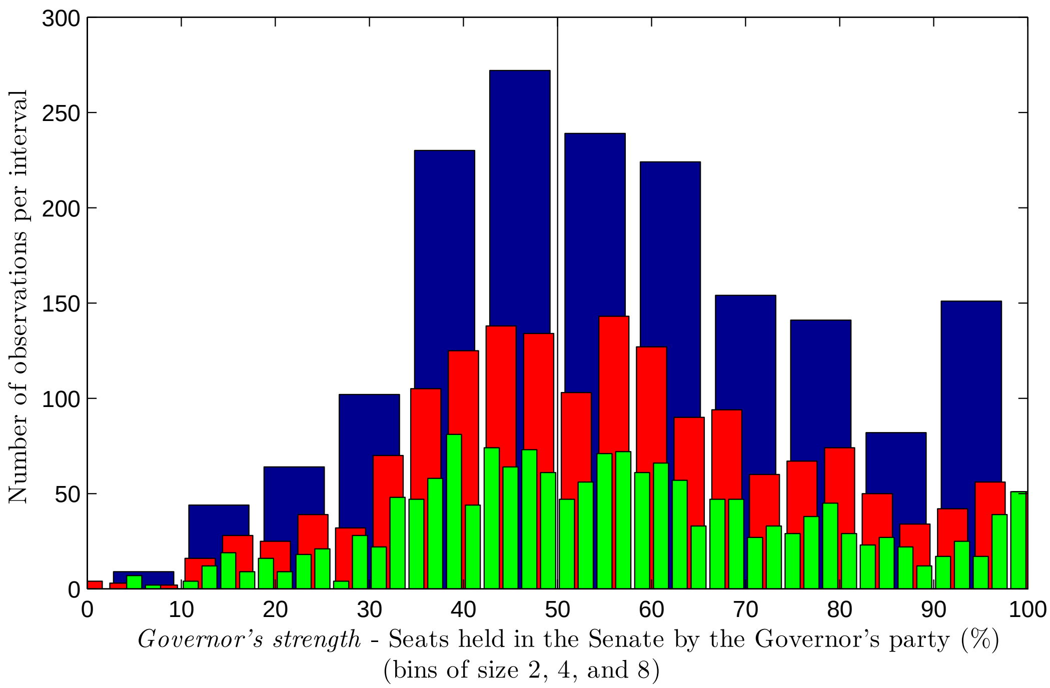
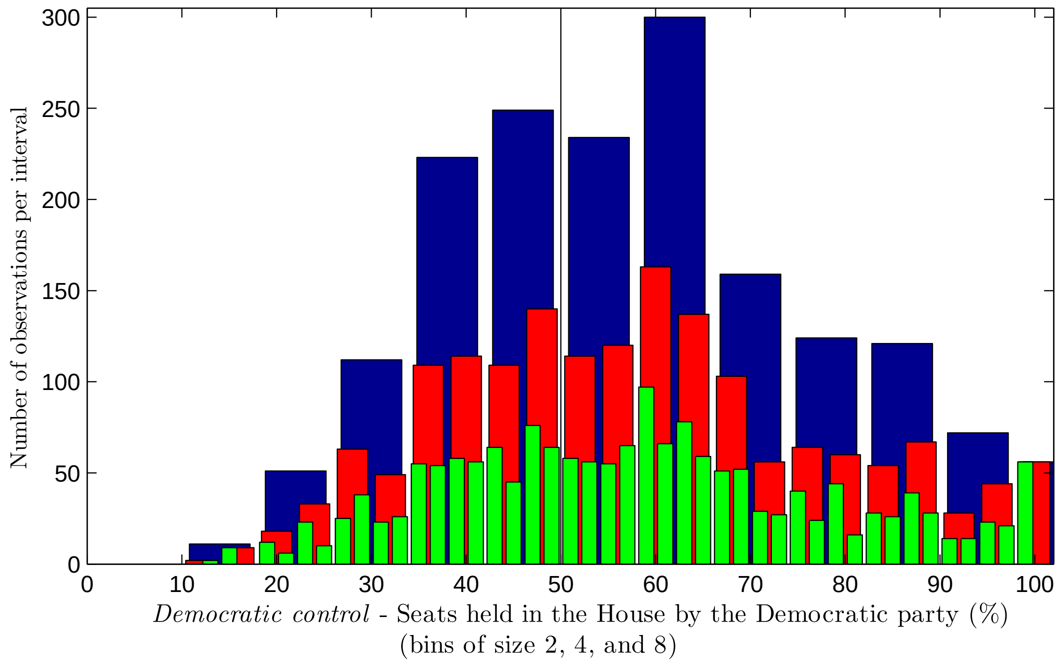


Figure 2: Histogram of forcing variable - *Governor's strength in the Senate*



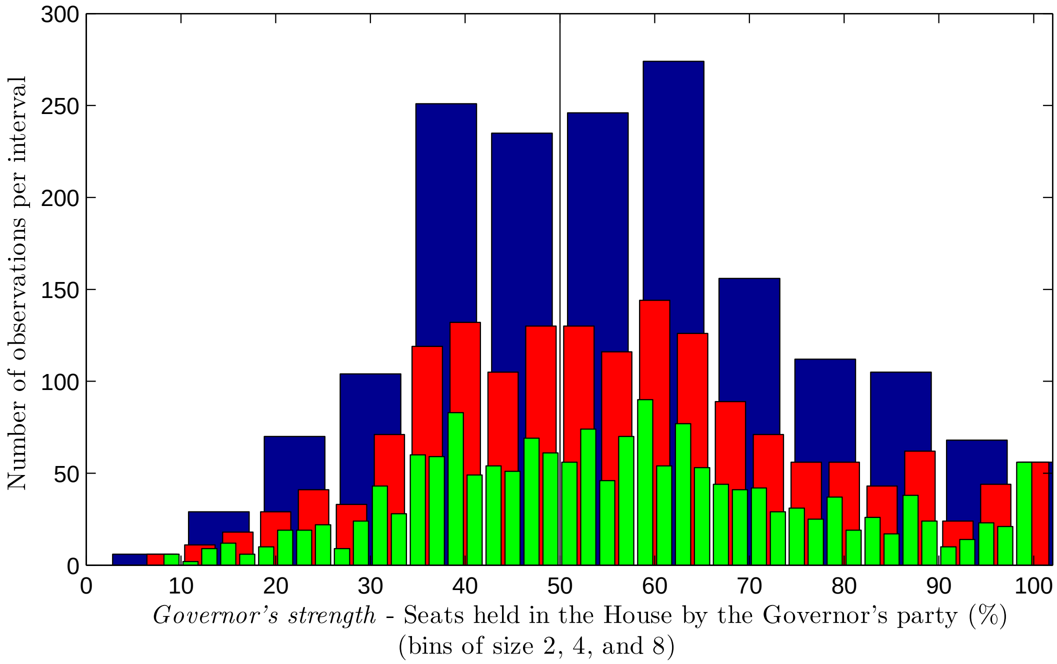
divided government in the interval (46, 50] is the same as the number of observations with an unified government in the interval (50,54]. Figures 3 and 4 give us no reason to believe in the manipulation of the composition of the lower House around the cutoff.

Figure 3: Histogram of forcing variable - *Democratic control in the House*



Given what we observe in Figures 1 to 4 we limit ourselves to using the party control of seats in the state House as a source for our forcing variables. Since, however, the House and the Senate have similar powers over the budget, we must look into whether the political control of the state Senate may be influencing our results. Specifically, we show that the likelihood of the state Senate being controlled by the Democrats is continuous around the cutoff at *Democratic control* = 50%, and that the likelihood of the state Senate being unified with the Governor is continuous around the cutoff *Governor's strength* = 50%. Therefore, our main results in Sections 3.1 and 4.1 can not be driven by differences in the political control of the Senate in either side of the cutoff. The interpretation of our results in Sections 3.1 and 4.1 is the effect of a change in the political control of the state House keeping

Figure 4: Histogram of forcing variable - *Governor's strength in the House*



everything else constant, including the political control of the state Senate and the partisan identity of the Governor.

2.4 Estimation Methods

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 3.1 and 4.1.

The discontinuity at the cutoff can in practice be estimated in a number of ways. The simplest approach is just to compare the average outcomes in a small neighborhood on either side of the treatment cutoff. The problem with this approach is that it may generate imprecise estimates since the regression discontinuity method is subject to a large degree of sampling variability. To rely solely on this approach would require a very large sample size.

In all of the figures in this paper, we present local averages in intervals of width 0.5. These intervals are constructed so that the interval immediately to the left of the 50% cutoff is $(49.5, 50]$. The interval immediately to the right is $(50, 50.5]$. The local average estimates are a crude estimate of the discontinuity, but they are a good indicator of the variability of the data. This can be seen in Figure 5 and 6, where the local averages are similar to the estimates from the regression methods around the cutoff, which is also the interval with the highest density.

An equivalent but more efficient method is to estimate two functions: one with observations to the left of the cutoff 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 cutoff.[14] The advantage of this method is that both estimating the discontinuity and calculating the standard errors are straightforward. One of our main concerns is that some of our results are sensitive to the polynomial degree and that 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.

Another equivalent alternative is a nonparametric approach.[15] This method does not impose any constraints on the functional form. We follow the standard nonparametric approach and use local linear regressions with a triangular kernel.[16] The local linear regression

[14]We have experimented with other polynomial degrees and found similar results to our main specification when allowing for a third-degree polynomial or higher. These results are available on request.

[15]By "equivalent" we mean that conditional on the sample being large enough, all three methods should estimate the same discontinuity.

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

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

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

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

method, as argued in Hahn et al. (2001), fairs relatively better at the boundaries than other methods and therefore is the most appropriate to use with regression discontinuity design. A local linear regression estimates a regression function at a particular point by using only data within a bandwidth surrounding this point. The kernel function gives more weight to the data that are 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. Because most of our data seem to be concentrated around the 50% cutoff (see Figures 3 and 4), we apply their method to the data within the medians of the samples to the left, and to the right of the 50% cutoff. The optimal bandwidth for the subsample between the two medians is 7 with either *Democratic control* or *Governor's strength* as the forcing variable.[17] At each estimation point, the predicted value by the local linear regression is denoted by $\times$.

For the parametric estimates of the discontinuities at the cutoff, we present Huber-White standard errors robust to clustering by state. To estimate cluster robust standard errors for the nonparametric estimate, we use the wild cluster bootstrap. This does not require the residuals to be i.i.d.; nor does it require each cluster to have the same size.[18] Cameron et al. (2008) use Monte Carlo simulations to show that the wild cluster bootstrap works well, particularly when the number of clusters is small. As is shown in our results, the theoretical

[17] 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 441 observations, making up 26% of the sample. Out of the 38 states with line item veto, 32 are present. Out of 32, 26 states have observations with both Democratic and Republican majorities in the state House, and 24 have observations with both Republican and Democratic Governors. Only four states have only one type of government: Idaho (Democratic unified), Kentucky (Republican unified), Texas (Republican Governor, Democratic House), and West Virginia (Republican Governor, Democratic House). We have experimented with other bandwidths and the results do not change much with bandwidths of 3 to 7.

[18] 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).

cluster robust standard errors in the parametric estimates are similar to those estimated by the wild bootstrap procedure with a local linear regression.

3 *Democratic Control* and the Tax Level

3.1 First Result

In this section, our forcing variable is the percentage of seats controlled by the Democratic party in the state House, which we call *Democratic control*. We can see the results in Figures 5. On the y-axis, we have the state tax level. As the percentage of seats held by the Democrats moves from the left to the right of the 50% cutoff point, the Democrats gain a majority in the state lower House. Our estimation shows no significant discontinuity in the tax level even though we have estimated two independent functions, each using data on only one side of the 50% cutoff. This is our first result. Our regression discontinuity design indicates no causal relationship between the partisan identity of the party controlling the state lower House and the tax level. As we mentioned in the Introduction, this result goes against the recent literature that has looked at the question of whether partisan identity has a causal effect on the tax level in the American states (Reed (2006); Besley and Case (2003)). On the other hand, this result is similar to the Ferreira and Gyourko (2009) findings regarding American Mayors in U.S. cities.

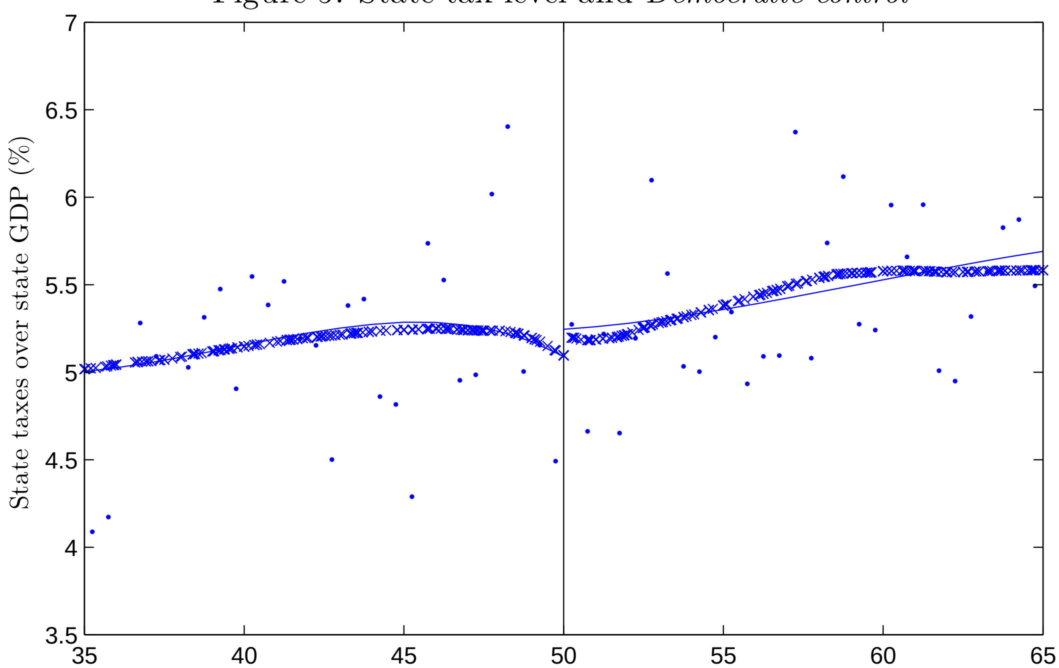
Our result of no discontinuity holds both for the subsample of states with the line item veto and for the combined sample including both the states with the line item veto and the states with the block veto. In the main text we present the results for the subsample of states with the line item veto. We do so to make the comparison with our results in Section 5 easier. In the Appendix, Section A.1 we show results for the combined sample that are are equivalent to the results in Table 5 and Table 6.

Table 5: State tax level and *Democratic control*

Method	Jump at 50%	Bootstp mean	SE
4-degree polynomials	0.15	-	(0.34)
LLR(bandwidth 7)	0.11	0.00	(0.30)

Note: This sample comprises 1712 observations of states with the line item veto from 1960 to 2006. Each observation represents a state within a year. The dependent variable is the total sum of a state's income, sales, and corporate taxes divided by state GDP and is shown as a percentage. The forcing variable is *Democratic control* - the percentage of seats in the state House of Representatives that belongs to the Democrats. The discontinuity is estimated at *Democratic control* = 50%. Row 1 shows the results for a 4-degree polynomial on each side of the cutoff. Row 2 shows the result for a local linear regression specification with a triangular kernel and a bandwidth of 7. Theoretical cluster robust standard errors are provided for the polynomial regression together with bootstrapped cluster-robust standard errors by state for the nonparametric regression (wild bootstrap with 10,000 draws each).

Figure 5: State tax level and *Democratic control*



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

3.2 Robustness checks

As we mentioned in Section 2 (see Table 1), the 1960s had a considerably lower average tax level than the other decades. The first robustness check we implement is to exclude all of the observations from the 1960s. We then continue and exclude one decade at a time. As can be seen in the Appendix, Section A2 Table 13, the result is robust to each exclusion.

Our result could also have been driven by a particular state. To accommodate this, we also perform a robustness check excluding one state at a time. The exclusion of no particular state changes our result; we find no significant discontinuity in the tax level. This result can be seen in the Appendix, Section A3, Table 15.

We also check to see if the results in Table 5 hold when we use 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 5, we find no significant discontinuity. This result can be seen in the Appendix, Section A4, Table 17.

3.3 Checking the Validity of the Design

As we showed in Section 2.3 the number of observations on either side of the cutoff is very similar. This suggests that our forcing variable is not being manipulated at the cutoff. Another check for the validity of our design is to see whether any other variable is discontinuous at the 50% cutoff. If this were the case, it could indicate that our "randomization" does not work, that is, that observations on both sides of the cutoff are not similar and therefore we cannot read our results as the lack of a causal link between *Democratic control* and the tax level. As we can see in Table 6 we find no significant discontinuity in any of the other covariates.[19]

Row 1 in Table 6 shows that observations on both sides of the cutoff are as likely to have

[19] In Table 6 we only show the results for the parametric specification. The nonparametric specification and the local averages give the same result. These are available on request.

the Senate controlled by the Democratic party. This is an important result. Even though the Senate role in setting the budget is as important as that of the House, around the cutoff at least, the discontinuous change in political control comes from the House only. Row 2 shows a similar result for a variable indicating the partisan identity of the Governor.

Table 6: Covariates and *Democratic Control* - States with the line-item veto (4-degree polynomial)

Variable	Jump at 50%	SE
Democratic control Senate	-0.02	(0.15)
Democratic Governor	-0.07	(0.19)
Turnout	-0.02	(0.05)
Midterm election	0.11	(0.12)
Population	0.82	(1.37)
Income per capita	0.44	(1.04)
Unemployment rate	0.03	(0.46)
Local property taxes	-0.14	(0.33)
Tax and expenditure limitations	0.03	(0.13)
Supermajority requirements	-0.04	(0.08)
State tax level lagged twice	0.19	(0.34)

Note: This sample comprises 1712 observations of states with the line item veto from 1960 to 2006. Each observation represents a state within a year. *Democratic control Senate* takes value 1 if the state Senate is controlled by the Democratic party, and value 0 otherwise. *Democratic Governor* takes value 1 if the Governor is a Democrat, and value 0 otherwise. *Turnout* is defined as the fraction of the population that turned out to vote in the last election. *Midterm election* takes value 1 if the election for that observation was a midterm election, and 0 if the Governor was also chosen in that election. *Population* is the state population in millions for a given year. *Income per capita* is the state income per capita in thousands of 1982-dollars. *Unemployment rate* is the state unemployment rate in a year. *Local property taxes* is the percentage of a state average property tax in a year divided by state GDP. *Tax and expenditure limitations* takes value 1 if the state has a tax limitation rule in that year, and value 0 otherwise. *Supermajority requirements* takes value 1 if the state in that year requires a supermajority to vote for a tax increase. The forcing variable is *Democratic control*, which is the percentage of seats in the state House of Representatives that belongs to the Democratic party. The discontinuity is estimated at *Democratic control* = 50% with a 4-degree polynomial on each side of the cutoff. Theoretical cluster-robust standard errors by state are in parentheses.

Finding no discontinuities in variables such as turnout and on the indicator variable for midterm elections reassures 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 likely to be midterm or simultaneous, and have the same average turnout.

Discontinuities in variables such as population, income per capita, unemployment rate, and average local property taxes could indicate that observations on both sides of the cutoff are not comparable. Let's focus on income as an example. Since taxes are progressive, richer states tend to have a higher tax level. If they were disproportionately allocated to the left of the cutoff, this could drive the average tax level up on the left of the cut off. Such a discontinuity on income per capita would be able to explain why we find no discontinuity in the tax level. 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.

In row 9 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 percentage of state income; whereas some have statutory bounds on expenditure growth rates.[20] We use an indicator variable that takes value 1 should such a rule be in place within a state during that year, and 0 otherwise. As shown in Table 4 the incidence of observations with such rules is on average similar on both sides of the cutoff.

In row 10, we look at another institutional feature: supermajority requirement for bills that imply an increase in tax level.[21] In principle, when such a requirement is adopted, it is no longer enough to hold 50% of seats to formally raise the tax level, which makes dealing with the observations that have supermajority requirements more problematic than dealing with other covariates. One option for dealing with the 240 observations with supermajority requirements is to drop them entirely, which does not change the results.[22] Another option would be to define the forcing variable as the distance from the cutoff so that the 66.6% cutoff

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

[21] Supermajority requirements were mostly adopted in the 1990s. Some supermajority requirements include all taxes, but most are less restrictive. For details see Waisanen (2008). For an analysis of their adoption and the effect on the tax level, see Knight (2000).

[22] These results are available on request.

is pooled with the 50% cutoff. However, in the states with supermajority requirements, the budget is still approved by a simple majority. The two cutoff points are not directly comparable. We prefer to keep the observations with supermajority requirements and treat them as another covariate for three reasons. Firstly, not all supermajority requirements apply to all forms of taxation. Secondly, a state's tax level may increase either due to economic growth or due to increased efforts to counter tax evasion, even without a formal tax hike. Finally, tax cuts do not require a supermajority. As we can see in row 10, we find no discontinuity in the incidence of observations with a supermajority requirement.

In Row 11, we treat the lagged tax level as another covariate. We lag the tax level twice. This means that for an observation at the current year t, we look at the tax level at year $t-2$. We do so because of the nature of our data. Each election cycle for the state House of representatives is two years. Our political variables therefore only change every two years, whereas the tax level changes every year. This means that regressing the current *Democratic control* on the tax level lagged once $(t-1)$ will for half of our observations be the same as regressing the current *Democratic control* on the current tax level. Such an estimation would be partly a repetition of the contemporaneous regression and therefore would not be a good test of the validity of our design. Finding no discontinuity in the lagged tax level is an indication that our design works well, and that we can interpret the lack of a contemporaneous discontinuity in the tax level as the lack of a causal relationship between *Democratic control* and the tax level.

4 *Governor's Strength* and the Tax Level

4.1 States with the Line Item Veto

Our second result is summarized in Figures 6 and Table 7. We look at the relationship between the tax level and *Governor's strength*, which we define as the percentage of seats in the state House of Representatives that belong to the same party as the current Governor. We estimate a statistically significant jump in the tax level around the cutoff point: *Governor's strength* = 50%. To the right of the cutoff point, the government is unified; to the left, the government is divided. The parametric quartic specification and the local linear regression yield very similar results: a discontinuity of around 0.67. This is significant at the 1% level with heteroskedastic robust standard errors, and significant at the 10% level with standard errors robust to clustering by state. For presentation purposes we only report the cluster-robust standard errors in the paper. An estimate of 0.67 implies an increase in the average tax level from 5% to 5.67% of GDP - a 13% increase.

Table 7: State tax level and *Governor's strength*

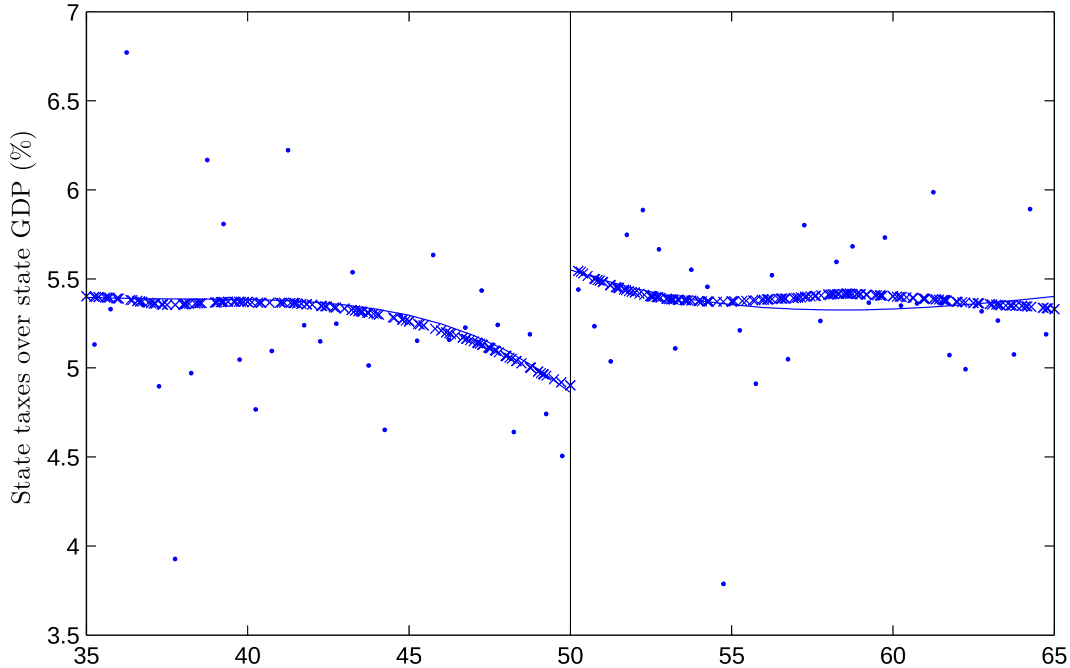
Method	Jump at 50%	Bootstp mean	SE
4-degree polynomials	0.69	-	(0.35)*
LLR(bandwidth 7)	0.66	0.60	(0.36)*

Note: This sample comprises 1712 observations of states with the line item veto from 1960 to 2006. 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%. Row 1 shows the results for a 4-degree polynomial on each side of the cutoff. Row 2 shows the result for a local linear regression specification with a triangular kernel and a bandwidth of 7. Theoretical cluster robust standard errors are provided for the polynomial regression together with bootstrapped cluster-robust standard errors by state for the nonparametric regression (wild bootstrap with 10,000 draws each).

In Figure 6, we focus on the data surrounding the discontinuity. One can see the statistical strength of the estimated discontinuity: the parametric and nonparametric estimates to the left of the cut off point lie below all of the local averages to its right in the interval (50, 65], with one exception. The outlier local average at the 55% mark is due to two observations: Ohio in 1965 with a tax level of 2.8%, and Ohio in 1966 with a tax level of 2.8%. Similarly, the estimate to the right of the cutoff is higher than most of the local averages to the left, with the exception of a few that are far from the cutoff. [23]

[23] A puzzling aspect of Figure 6 is the negative slope to the left of the 50% cutoff. The paper

Figure 6: 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

4.2 States with the Block Veto

Before we discuss the robustness checks and the tests of the validity of our design, we present in this subsection our result that there is no discontinuity in the tax level in states with the block veto.

We have only 292 observations for the states with the block veto, unlike the states with the line item veto, for which we have 1712 observations. Nevertheless, we apply the same estimation procedures. The results can be seen in Table 8.[24] These are in line with the hypothesis we mentioned in the Introduction that the Governor's influence should be less in the states with the block veto. In the Appendix, Section A5 we show that there are no

de Magalhães and Ferrero (2011) provides a rational for such a negative slope. For a given governor, as the size of the opposition increases in the Legislature, the degree of alignment between the Governor and the majority in the Legislature increase (more people will have voted for both the Governor and the opposing majority), and so does the amount of transfers.

[24]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.

significant discontinuities in the covariates, with the exception of the state population. This is a sign that within the subsample of states with the block veto the regression discontinuity design is not as robust. The significant discontinuity in state population could be a sign of the lack of validity of this design for the sample of states with the block veto, or simply a reflection of a small sample problem.

Table 8: State tax level and *Governor's strength* in states with the block veto

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

Note: This sample comprises 292 observations of states with the block veto. Indiana, North Carolina, New Hampshire, Nevada, and Vermont have the block veto throughout the sample from 1960 to 2006. Iowa, Washington, and Wyoming switched from the block veto to the line item veto in 1969; Maine 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%. Row 1 shows the results for a 4-degree polynomial on each side of the cutoff. Theoretical heteroskedastic robust standard errors are in parentheses. Row 2 shows the results for a local linear regression specification with a triangular kernel. Theoretical heteroskedastic robust standard errors are provided.

4.3 Robustness Checks

From this subsection onward, we look at the robustness checks and the validity tests for the results regarding the states with the line item veto in Section 4.1.

Regression discontinuity design and local linear regression estimates are particularly sensitive to outliers, such as Ohio in 1965 and 1966. As mentioned in Section 1 (see Table 1), the average tax level in our sample was much lower in the 1960s than in any other decade. The estimated discontinuity could have been driven by a few observations from the 1960s to the left of the cutoff. In order to eliminate any doubt, we run the same robustness check as in Section 3.2. We exclude the 1960s and then we exclude one decade at a time. As we show in the Appendix, Section A2, Table 13, the result is robust to each exclusion.

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 2.4) would show a significant discontinuity by construction. To check for this, we run 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 tend to be positive, none is statistically significant. See the Appendix, Section A6, Table 20.

We also check to see if our Table 7 results hold when using an alternative measure for the tax level. We use state tax revenues per capita in 1982-dollars. 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 a bandwidth of 7 is significant. As can be seen in the Appendix, Section A4, Table 18, depending on the specification, the point estimates of the discontinuity vary from $92 to $144 per capita. To the left of the cutoff the average tax revenue per capita is around $700. The discontinuity then implies an increase in the average tax level that may vary from 13% to 20%. This is in keeping with our estimate of an increase of 13% in the tax level when using taxes over GDP as our dependent variable.

Because of the small sample around the cutoff, our result could be dependent on a particular outlier state. To accommodate this, we also perform a robustness check excluding one state at a time. As can be seen in the Appendix, Section A3, Table 16, the discontinuity in the tax level remains significant.

4.4 Checking the Validity of the Design

In this section, we check the validity of the result described in Section 5.1 by examining whether our forcing variable, *Governor's strength*, is associated with discontinuities in other covariates at the same 50% cutoff point. In Table 9, we show that there are no significant discontinuities for most of the covariates.[25]

One result is worth discussing in more detail. The states' local 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 that we found in Section 4.1 using state-wide taxes. Such a result would have been an indication that the discontinuity in Section 4.1 is driven by an unobservable variable that influences all taxes, both local and state wide, and not by the alignment between the state lower House and Governor. As can be seen in Table 9, we find no significant discontinuity in the local property tax.

We do find a significant discontinuity for two covariates: in the indicator variable for a supermajority constraint and in the lagged tax level. In both cases the discontinuity is not significant when the nonparametric estimation method is used. This can be see in Tables 10 and 11.

In Table 10 the conflicting results between parametric and nonparametric estimation may derive from a combination of the infrequency of the supermajority indicator variable and the parametric specification, which gives more 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. We also note that the results in Section 4.1 are robust to the exclusion of the 240 observations with supermajority requirements.

In Table 11 we investigate the statistical significance of the discontinuity for bandwidths close to the cutoff. Our main concern with the parametric estimate is that it relies on data far from the cutoff. We find that the estimated discontinuity on the the twice-lagged tax level is not significant when we restrict the data to around the cutoff. We see these results as an indication that the discontinuity estimated by the polynomials is not robust.

[25]The nonparametric estimates are available on request.

Table 9: Other covariates and *Governor's strength* - quartic-polynomial specification

Variable	Jump at 50%	SE
Governor's party control over the Senate	-0.05	(0.14)
Democratic Governor	-0.21	(0.14)
Turnout	-0.03	(0.03)
Midterm election	-0.09	(0.11)
Population	0.75	(1.67)
Income per capita	0.19	(0.84)
Unemployment rate	0.00	(0.44)
Local property taxes	-0.12	(0.37)
Supermajority requirements	-0.15	(0.09)*
Tax and expenditure limitations	-0.05	(0.13)
State tax level lagged twice	0.66	(0.35)*

Note: This sample comprises 1712 observations of states with the line item veto from 1960 to 2006. Each observation represents a state within a year. *Governor's party control over the Senate* is an indicator variable taking value 1 if the majority in the Senate belongs to the Governor's party, and value 0 otherwise. *Democratic Governor* takes value 1 if the Governor is a Democrat, and value 0 otherwise. *Turnout* is defined as the fraction of the population that turned out to vote in the last election. *Turnout* is defined as the fraction of the population that turned out to vote in the last election. *Midterm election* takes value 1 if the election for that observation was a midterm election, and value 0 if the Governor was also chosen in that election. *Population* is the state population in millions for a given year. *Income per capita* is the state income per capita in thousands of 1982-dollars. *Unemployment rate* is the state unemployment rate in a year. *Local property taxes* is the percentage of a state average property tax in a year divided by state GDP. *Supermajority requirements* takes value 1 if the state in that year requires a supermajority to vote for a tax increase. *Tax and expenditure limitations* takes value 1 if the state has a tax limitation rule on that year, and value 0 otherwise. The 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 4-degree polynomial on each side of the cutoff. Theoretical cluster-robust standard errors by state are in parenthesis.

Table 10: Supermajority requirements and *Governor's strength*

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

Note: This comprises 1712 observations of states with the line item veto from 1960 to 2006. Each observation represents a state within a year. The dependent variable takes value 1 if the state has a supermajority requirement for a tax increase (240 observations), 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%. Row 1 shows the results for a 4-degree polynomial on each side of the cutoff. Theoretical cluster robust standard errors are provided for the polynomial regression together with bootstrapped cluster-robust standard errors by state for the nonparametric regression (wild bootstrap with 10,000 draws each).

Table 11: Tax level and lagged tax level on *Governor's strength* - different bandwidths

Method	Jump at 50%	Bootstp mean	SE
Current tax level on current *Governor's strength*			
LLR(bandwidth 3)	0.61	0.65	(0.40)
LLR(bandwidth 4)	0.67	0.68	(0.37)*
LLR(bandwidth 5)	0.69	0.69	(0.37)*
LLR(bandwidth 6)	0.68	0.64	(0.38)*
LLR(bandwidth 7)	0.66	0.60	(0.36)*
Tax level lagged twice on current *Governor's strength*			
LLR(bandwidth 3)	0.43	0.47	(0.38)
LLR(bandwidth 4)	0.50	0.51	(0.35)
LLR(bandwidth 5)	0.52	0.55	(0.34)
LLR(bandwidth 6)	0.57	0.54	(0.33)
LLR(bandwidth 7)	0.55	0.52	(0.32)

Note: This sample comprises state-years with the 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. Bootstrapped cluster-robust standard errors by are provided in parenthesis (wild bootstrap with 10,000 draws each).

5 Concluding remarks

Lee et al. (2004) find that voters elect policy instead of affecting policy choices by politicians. They find no evidence for convergence of policy platforms as would be predicted by the median voter model. Our first result could at face value go against theirs: we find that the tax level is the same whether the Democrats or the Republicans control the state House. Others (Besley and Case (2003); Reed (2006); and Leigh (2008)) find that the tax level is the same whether the Governor is a Democrat or a Republican. Interestingly, though, we find that the alignment between a Governor and the majority in the state House leads to an increase in the tax level. This alignment is measured by party affiliation. Parties are important for our second result. Our conjecture is that parties matter insofar as they represent a constituency and that when unified, both Governor and Legislature are able to cater to the preferences of their specific constituency with government transfers.[26] Such a model would be in line with Glaeser and Ward (2006), who argue that partisan differences are mostly based on religion and culture and less oriented along economic issues.

If the Legislature and the Governor respond to the same constituency, they have no institutional restraints on raising taxes for everyone and targeting transfers mostly to their supporters. The incentives to do this are the same whether the unified government is Democratic or Republican. The type of expenditure, however, may still be partisan. In another paper, de Magalhães and Ferrero (2011) develop this idea further in a simple model of separation of powers, parties, and redistribution.

[26]It is not straightforward to identify what these transfers may be and how they divide between party lines. They could be partisan neutral pork-barrel or they could be expenditures with partisan connotation, such as school vouchers versus higher salaries to teachers. They must be present in most states and have the same partisan association in every state. We were unable to find specific expenditure measures that would allow us to test our conjecture that the composition of expenditure may change whether Democrats or Republicans are in power.

A Robustness Check

A.1 *Democratic Control* and the State Tax Level: All States

Table 12: State tax level, Covariates, and *Democratic Control*: all states (4-degree polynomial)

Variable	Jump at 50%	SE
State tax level	-0.19	(0.30)
State taxes per capita	-36.15	(69.82)
Democratic control Senate	-0.05	(0.12)
Democratic Governor	-0.08)	(0.15)
Turnout	-0.01	(0.03)
Midterm election	0.11	(0.11)
Population	-1.11	(1.39)
Income per capita	-0.16	(0.84)
Unemployment rate	0.09	(0.38)
Local property taxes	-0.05	(0.31)
Tax and expenditure limitations	0.00	(0.11)
Supermajority requirements	-0.09	(0.07)
State tax level lagged twice	-0.16	(0.29)

Note: This sample comprises 2004 observations of states with both the line item veto and the block veto from 1960 to 2006. Each observation represents a state within a year. *State tax level* is the total sum of a state's income, sales, and corporate taxes divided by state GDP in percentage terms. *State taxes per capita* is the total sum of a state's income, sales, and corporate taxes per capita in 1982-dollars. *Democratic control Senate* takes value 1 if the state Senate is controlled by the Democratic party, and value 0 otherwise. *Democratic Governor* takes value 1 if the Governor is a Democrat, and value 0 otherwise. *Turnout* is defined as the fraction of the population that turned out to vote in the last election. *Midterm election* takes value 1 if the election for that observation was a midterm election, and value 0 if the Governor was also chosen in that election. *Population* is the state population in millions for a given year. *Income per capita* is the state income per capita in thousands of 1982-dollars. *Unemployment rate* is the state unemployment rate in a year. *Local property taxes* is the percentage of a state average property tax in a year divided by state GDP. *Tax and expenditure limitations* takes value 1 if the state has a tax limitation rule on that year, and value 0 otherwise. *Supermajority requirements* takes the value 1 if the state in that year requires a supermajority to vote a tax increase. The forcing variable is *Democratic control*, which is the percentage of seats in the state House of Representatives that belongs to the Democratic party. The discontinuity is estimated at *Democratic control* = 50% with a 4-degree polynomial on each side of the cutoff. Theoretical cluster-robust standard errors by state are in parentheses.

A.2 Excluding decades

Table 13: Tax level and *Democratic control*: one decade excluded at a time (4-degree polynomial)

Excluded decade	Jump at 50%	SE
1960s	0.13	(0.31)
1970s	0.23	(0.38)
1980s	0.01	(0.40)
1990s	0.24	(0.41)
2000s	0.24	(0.35)

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

Table 14: Tax level and *Governor's strength*: one decade excluded at a time (4-degree polynomial)

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

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

A.3 Excluding One State at a Time

Table 15: Tax level and *Democratic control*: one state excluded at a time (4-degree polynomial)

Excluded	Jump at 50%	Cluster robust-SE	Excluded	Jump at 50%	SE
AL	0.16	(0.35)	AZ	0.12	(0.34)
CO	0.22	(0.35)	CT	0.23	(0.35)
DE	0.16	(0.35)	FL	0.11	(0.34)
GA	0.16	(0.35)	IA	0.22	(0.35)
IL	0.05	(0.37)	KS	0.15	(0.35)
KY	0.17	(0.35)	LA	0.16	(0.35)
MA	0.06	(0.34)	MD	0.17	(0.34)
MI	0.07	(0.36)	MO	0.10	(0.35)
MS	0.19	(0.35)	MT	0.10	(0.36)
ND	0.20	(0.35)	NJ	0.05	(0.34)
NM	0.21	(0.35)	NY	0.26	(0.34)
OH	0.12	(0.35)	OK	0.23	(0.34)
OR	0.25	(0.34)	PA	0.23	(0.40)
SC	0.12	(0.35)	SD	0.15	(0.31)
TN	0.14	(0.36)	TX	0.17	(0.35)
UT	0.13	(0.35)	VA	0.11	(0.35)
WA	0.20	(0.36)	WI	0.18	(0.35)
WV	0.09	(0.34)	WY	0.22	(0.35)

Note: This sample comprises tate-years with line item veto from 1960 to 2006. Each regression is run with 1665 observations. The first exception is the regression excluding Connecticut, that has 1669 observations, as Connecticut had fours years with an independent Governor dropped. The regressions excluding Iowa, Washington and West Virginia have 1674 observations each, as these states adopted the line item veto in 1969. The dependent variable is the percentage of the sum of income, sales, and corporate taxes in a state divided by state GDP and shown as a percentage. The forcing variable is *Democratic control*, the percentage of seats in the state House of Representatives that belong to the Democratic party. The discontinuity is estimated at *Democratic control* =5 0%. In each entry, we exclude from the sample the state in columns 1 or 3. Each row shows the results for a 4-degree polynomial on each side of the cutoff. Theoretical cluster-robust standard errors by state are in parentheses.

Table 16: Tax level and *Governor's strength*: one state excluded at a time (4-degree polynomial)

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

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

A.4 Alternative Measure: State Taxes Per Capita

Table 17: Taxes per capita and *Democratic control*

Method	Jump at 50%	Bootstp mean	SE
4-degree polynomials	30.75	-	(86.56)
LLR(bandwidth 7)	43.93	39.27	(68.82)

Note: This sample comprises 1712 observations of states with the line item veto from 1960 to 2006. Each observation represents a state within a year. The dependent variable is the total sum of a state's income, sales, and corporate taxes per capita in 1982-dollars. The forcing variable is *Democratic control*, which is the percentage of seats in the state House of Representatives that belong to the Democratic party. The discontinuity is estimated at *Democratic control* = 50%. Row 1 shows the results for a 4-degree polynomial on each side of the cutoff. Theoretical cluster robust standard errors are provided for the polynomial regression together with bootstrapped cluster-robust standard errors by state for the nonparametric regression (wild bootstrap with 10,000 draws each).

Table 18: Taxes per capita and *Governor's strength*

Method	Jump at 50%	Bootstp mean	SE
4-degree polynomials	92.2	-	(69.7)
LLR(bandwidth 7)	143.8	116.4	(64.1)*

Note: This sample comprises 1712 observations of states with the line item veto from 1960 to 2006. Each observation represents a state within a year. The dependent variable is the 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%. Row 1 shows the results for a 4-degree polynomial on each side of the cutoff. Theoretical cluster robust standard errors are provided for the polynomial regression together with bootstrapped cluster-robust standard errors by state for the nonparametric regression (wild bootstrap with 10,000 draws each).

A.5 *Governor's Strength* and Covariates: States with the Block Veto

Table 19: Other covariates and *Governor's strength*: states with the block veto (4-degree polynomial)

Variable	Jump at 50%	Robust-SE
Governor's party control over the Senate	-0.17	(0.18)
Democratic Governor	-0.15	(0.17)
Turnout	-0.03	(0.04)
Midterm election	-0.12	(0.20)
Population	0.20	(0.10)**
Income per capita	-0.30	(1.54)
Unemployment rate	0.84	(0.53)
Local property taxes	-0.53	(0.50)
Tax and expenditure limitations	-0.07	(0.16)
Supermajority requirements	-0.08	(0.06)
State tax level lagged twice	-0.30	(0.30)

Note: This sample comprises 292 observations of states with the block veto from 1960 to 2006. Each observation represents a state within a year. *Governor's party control over the Senate* is an indicator variable taking value 1 if the majority in the Senate belongs to the Governor's party, and value 0 otherwise. *Democratic Governor* takes value 1 if the Governor is a Democrat, and value 0 otherwise. *Turnout* is defined as the fraction of the population that turned out to vote in the last election. *Midterm election* takes value 1 if the election for that observation was a midterm election, and value 0 if the Governor was also chosen in that election. *Population* is the state population in millions for a given year. *Income per capita* is the state income per capita in thousands of 1982-dollars. *Unemployment rate* is the state unemployment rate in a year. *Local property taxes* is the percentage of a state average property tax in a year divided by state GDP. *Tax and expenditure limitations* takes value 1 if the state has a tax limitation rule on that year, and value 0 otherwise. *Supermajority requirements* takes value 1 if the state in that year requires a supermajority to vote a tax increase. 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 4-degree polynomial on each side of the cutoff. Theoretical heteroskedastic robust standard errors are in parentheses.

A.6 Uniqueness of Discontinuity

Table 20: Tax level and *Governor's strength* - alternative cutoff points (4-degree polynomial)

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

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

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