Relaxing Electoral Constraints in Local Education Funding

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Abstract

We study a policy that loosened constraints on local governments by lowering the share of votes required to pass school capital improvement bond referenda. We show that the policy change resulted in a doubling of approved spending, via larger tax proposals that received less support from voters. This effect is concentrated in more racially diverse jurisdictions. We develop an agenda-setter model of the interaction between local government officials and voters to illustrate potential mechanisms behind these results.

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1 Introduction

If voters do not like federal tax policy, they can elect new representatives. At the local level, though, voters can directly deny the tax increases their elected officials propose. All but three states have a limit on either the taxing or spending abilities of local government and, most commonly, state laws require that increases in local taxes receive a public referendum before they are enacted. (Mullins, 2010). In the November 2020 election, voters nationwide decided on the fate of $52.7 billion of proposed funding, down from $70 billion four years prior (Pierog, 2020).

Requirements that budgeting questions be put to a vote reduce the level of spending (Funk and Gathmann, 2011; Feld and Matsusaka, 2003). However, the rules that govern these votes vary in myriad ways. States differ in the types of taxes or spending the rules cover: some only allow proposals for capital spending, while others also include current expenditure spending. States also often limit the total amount of tax revenue or the tax rate governments can propose, and vary in whether they adjust for inflation, for changes in population, or for growth in the property tax base. Certain election rules limit the timing of when governments can put proposals on the ballot, since local governments may use this timing flexibility strategically (Anzia, 2011; Kogan, Lavertu and Peskowitz, 2018; Meredith, 2009). States also differ in the vote share required to approve the proposals, with many proposals requiring more than a simple majority. There is little empirical research, however, documenting how these differences in voting requirements may affect government budgets, local spending, and the provision of public goods and services. This is a significant gap in the literature, given the millions of dollars in funding at stake in each local referendum, and the billions at stake nationwide.

In this paper, we study a proposition in California that weakened the constraints on some local governments by lowering the vote share required to approve capital funding for schools and community colleges. We use a difference-in-differences design around this policy change and data for over 4,000 local elections across the state over two decades. We estimate the effects of this policy change on the proposals made by affected districts, their outcomes at the ballot box, and on the eventual funding outcomes.

We develop a theoretical model of the interaction between a school board and voters, building on the literature in local political economy (Romer and Rosenthal, 1982; Barseghyan and Coate,

2014; Coate and Ma, 2017). In our model, the school board makes a tax proposal that the voter can accept or reject. Thus, the school board has "agenda-setting" power to extract policies closer to its preferences than that of the voter. However, uncertainty in how residents will vote hinders the exercise of this agenda-setting power. We use this model to show how a change in the required vote share affects the size of the proposals and the vote outcomes, and to show how these effects depend on the divergence in preferences between voters and elected officials.

We study how the policy change affected the funding outcomes of local governments. We find that Proposition 39 led to an additional $57 per resident in approved local government bonds, a more than 100% increase. This is a large impact, and one that affects governments unequally. There were larger effects on funding outcomes in more racially and ethnically diverse districts. Similarly, we find larger effects in jurisdictions with moderate levels of poverty, moderate white population shares, and fewer older residents. These results shed light on the characteristics of places where funding is most constrained by referendum requirements. Our model shows that the extent of a community's responsiveness to a change in the vote share requirement depends on the extent of disagreement between voters and their elected representatives, as well as the level of uncertainty in referenda outcomes that the elected officials face. Thus, the empirical results show what types of communities have larger disagreements or more uncertain election outcomes.

There are two channels through which these effects could occur: the behavior of elected officials when proposing funding and of voters when voting on the proposals. We find that the policy change made treated districts no more likely to propose a bond relative to other jurisdictions. However, the size of the bond proposals increased substantially, by $48 per resident, or a 59% increase. Naturally, the larger bond proposals may result in lower vote shares. Conditional on proposing a bond, we find that the policy change resulted in bond proposals receiving a lower percentage of votes in favor. However, this decline was smaller than the 11.7 percentage point decrease in the vote share requirement. In other words, school boards and community college districts experienced declines in support for their proposals that were smaller than the full amount of the policy change. Thus, we observe no change in the probability that affected districts approved any kind of new funding, and large increases in the probability that they approved new bonds. Even though these districts submitted larger proposals that had less support from the electorate, they resulted in increases in the probability of success. These results – a positive effect on proposal

size and a negative effect on vote shares – are consistent with the politician preferring higher spending than the voters, when interpreted through the lens of our model.

Our paper contributes to several strands of research. First, we contribute to empirical evidence on the fiscal and policy effects of tax limits. This literature builds on the work of Romer and Rosenthal (1978, 1979, 1982) which model the constraint on government in contexts where government officials have agenda setting power. Balsdon, Brunner and Rueben (2003) applies the logic of these agenda-setting models to proposals of and voting on school bonds. The authors estimate a structural model of school boards and voters and find that school boards favor a higher level of spending than voters but are risk averse in their proposals. We extend this line of research by leveraging a policy change, and our finding that relaxing the voting threshold results in larger proposals is consistent with their result.

We also contribute to an empirical literature on the effects of tax limits on the quality of public services (Figlio and Rueben, 2001; Poterba and Rueben, 1995; Dye and McGuire, 1997; Rose, 2010). These papers study the effect of the existence of local tax limits. By contrast, in this paper we study a change in a particular characteristic of the limit itself. Romer, Rosenthal and Munley (1992) shares that aim and considers the effects of matching aid and supermajority requirements in the context of their structural model. However, their data do not contain any heterogeneity in the vote requirements. We show that the vote share required to pass public spending has large effects on the amount of spending both proposed and implemented.

While this paper is the first to our knowledge to study the effects of the change in the voting threshold, two papers have studied voting on the constitutional amendment that resulted in this policy change. Brunner and Ross (2010) develops a model of voter support for supermajority rules and show that voter support for the supermajority rules is related to the income distribution in their school district. Balsdon et al. (2005) shows that voters in metropolitan areas with a more fragmented set of school districts were more likely to vote for the reduction in the threshold. An existing literature studies supermajority voting rules in the context of legislative voting (Messner and Polborn, 2004; Crain and Miller III, 1989). Most related to our work is Knight (2000), which instruments for supermajority requirements with the ease of amending state constitutions and finds that supermajority requirements lead to lower taxes. This paper complements these analyses by examining the effect of a change in the severity of a supermajority requirement in the context of

public referenda.

The environment of voting on school financing and the effect of the resulting funding has received significant study. Cerdán and Rueben (2003) details the history of school funding referenda in California. While we study the process of the school votes themselves, Cellini, Ferreira and Rothstein (2010) studies the effects of the resulting capital investments on house prices and Cellini (2009) examines their effects on higher education. These papers are part of a broader literature that studies the effects of school construction; the evidence on its effect on student outcomes is mixed. Large school construction projects may lead to improved student outcomes (Aaronson and Mazumder, 2011; Conlin and Thompson, 2017; Duflo, 2001; Neilson and Zimmerman, 2014). However, studies using regression discontinuity approaches to study school capital improvement bond referenda, like those we study, find limited evidence of positive effects on student outcomes (Cellini, Ferreira and Rothstein, 2010; Martorell, Stange and McFarlin Jr, 2016; Choi, 2019). An exception is Hong and Zimmer (2016) which finds positive long-run effects on test scores in Michigan. Biasi, Lafortune and Schönholzer (2024) find generally positive effects of capital improvements on test scores, and Jackson and Mackevicius (2024) find generally positive effects of spending on student outcomes, as do studies that focus on particular targets of spending like air conditioning (Park et al., 2020). These studies consistently find positive, sometimes large, effects on house prices, suggesting that households care a great deal about school facilities and school quality.

Lastly, we contribute to a literature on the support for public goods in diverse communities. We show how the effects of the loosened electoral constraint differ by the racial makeup of the jurisdiction. A broad literature has found that diversity is related to decreased support for government (Alesina, Baqir and Easterly, 1999; Dahlberg, Edmark and Lundqvist, 2012). However, some of these findings are not robust to alternative specifications (Boustan et al., 2013). Closely related to our work is Rugh and Trounstine (2011), that shows that more diverse cities propose fewer, larger municipal bonds than less diverse cities but end up authorizing similar levels of debt. The strategic proposals they document could drive the differential response to the policy change we study. Recent work has shown that increased diversity among local elected officials results in less spending on public goods (Beach and Jones, 2017). Our results suggest that in more diverse places, elected officials would prefer a higher level of spending than the voters.

The remainder of the paper is organized as follows. In the following section, we provide further detail about local government funding and the policy change we study; in section 3 we describe our model; in section 4 we describe the data we use; in section 5 we explain the empirical method; in section 6 we describe our results; and in section 7 we conclude.

2 Background

Our study focuses on funding for capital investments in local governments in California. Local governments with the power to tax include cities, school districts, community college districts, counties, and special districts that provide a particular service, such as airports, parks, water, and transit. In this section, we outline the options for these governments in generating revenue for investments.

2.1 Local government funding

California local governments are restricted from increasing property taxes but can generate additional revenue by increasing other taxes or issuing bonds. The available instruments vary depending on the type of government.

With property tax increases unavailable, local governments can adjust sales taxes, business taxes, utility taxes, and parcel taxes.[1] All these tax increases require voter approval. However, sales, business, and utility taxes are available only to counties and cities, not school districts. While taxes can be used for regular annual expenses, bonds can only be issued to fund capital investments and can be either revenue bonds or general obligation (GO) bonds. Revenue bonds, which do not require voter approval, must fund investments in revenue-generating assets, such as toll highways. These bonds are only useful for local governments with such assets to fund. In contrast, GO bonds require voter approval, are backed by the full faith and credit of the issuing government, and are repaid with property taxes over many years. California school districts primarily rely on GO bonds rather than parcel taxes, possibly because parcel taxes are less lucrative than GO bonds (Brunner,

[1] Parcel taxes, which are available to all forms of local governments, are a flat tax on each real estate parcel, unlike property taxes which are ad valorem taxes on the value of the properties.

2001).[2]

The state also plays a prominent funding role in school capital expenditures. State funds typically come from statewide GO bonds, which require a statewide vote. At the time of the vote on Proposition 39, the state typically paid 50% of the cost of new K-12 school facilities and 80% of the cost of modernizing existing facilities. The local district would then pay the remaining amount out of bonds passed via referendum.[3] Beginning in 1998, the state revised its system for approving and funding K-12 school facility projects and expanded funding for the program. This increased the availability of state matching funds for school construction. In addition, in 2002 the state created the Critically Overcrowded Schools program to make it easier and less costly for districts with schools that were deemed overcrowded to fund facilities.[4] We discuss the impact of these programs on our estimates in Section 6.6.

K-12 school districts are not the only local education jurisdictions that can raise additional revenue. There are 73 community college districts in the state, representing 114 individual colleges and comprising the largest public postsecondary system in the country. These districts have the ability to fund their capital investments through the same restrictions as school districts. That is, community college districts can issue GO bonds and parcel taxes, though in practice they tend to rely on GO bonds for the same reasons as school districts. The state funds 100% of community college facilities when the legislature specifically authorizes the project, but otherwise the district can use local bonds to pay the full cost of any projects.

2.2 Proposition 39

In California, a series of court decisions and the passage of the Proposition 13 amendment to the state constitution in 1978 drastically limited the ability of school districts to fund education using local resources, placing greater responsibility on the state government. It was difficult for local school districts to fund school facility investments during this time so spending on capital investments plummeted. In 1984, the passage of Proposition 46 allowed school districts to issue general obligation (GO) bonds to finance school construction projects. Local school boards could

[2]For more information on the scope of local finance in California across different types of jurisdictions, see Cerdán and Rueben (2003).
[3]In some "hardship cases" the state would pay the entire cost of new facilities or modernization.
[4]See Brunner (2006) for a detailed description of California K-12 school facility funding during this period

propose a bond and put it on the ballot in a referendum, where it required a two-thirds majority to prevail. Around the same time, school districts began using parcel taxes, which also required a two-thirds majority, to fund operations.

Following concerns that school facilities were not receiving enough investment under this system, California voters considered two consecutive propositions in 2000, which would have made it easier for proposed bonds to win the approval of voters. First, in March 2000, California voters rejected Proposition 26, which would have decreased the voting threshold from a two-thirds super-majority to a simple majority. Then, in November 2000, voters approved Proposition 39, which lowered the threshold needed to pass a general obligation bond to 55 percent for K-12 districts and community college districts.[5] It was accompanied by legislation that placed additional requirements on school bonds to qualify for the 55 percent level. Most notably, it required that bond referenda occur during a statewide election or regularly scheduled local election rather than a special election. In addition, it required a two-thirds majority of the governing board approve the proposal (rather than a majority) and set a maximum amount for the tax rate levied to repay the bond.[6] Bond proposals that did not meet these requirements would not qualify for the lower 55% vote requirement. It did not alter the vote requirements to pass parcel taxes. Following the passage of the proposal, the new voting threshold and rules went into effect in 2001.[7]

While Proposition 39 brought a variety of changes to the proposal and approval process, two features are likely to be most important – the change in vote share that we focus on and the election timing requirement.

Panel a) of Figure 1 shows the distribution of the vote shares in favor of proposed education bonds separately before and after the change in vote requirement. The two vertical lines show the required vote share before and after the passage of Proposition 39. It is clear that the distribution of vote shares shifted downward over this time frame. Moreover, this shift seems to have occurred at all parts of the distribution, with the median at approximately 70% of votes in favor in the years prior to the change and approximately 64% of votes in favor following the change. This

[5] Balsdon et al. (2005); Brunner and Ross (2010) study what can be inferred from the difference in votes on Propositions 26 and 39.

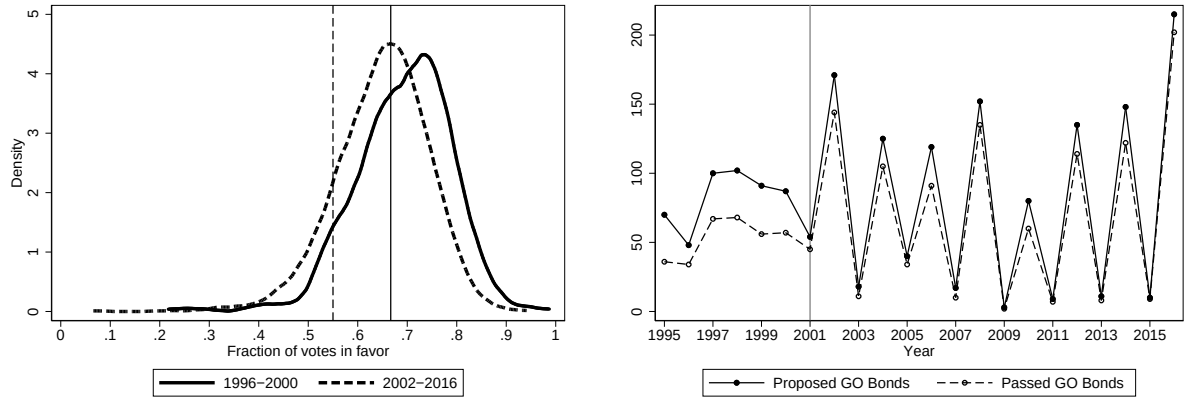
[6] The proposition itself also required that the bond funds only be used for facilities or equipment investments, the proposals include a specific list of school projects to be funded, and the district conduct annual independent audits on the use of the funds.

[7] In the first year under the new rule, many referenda did not qualify for the new lower level and operated under the old two-thirds threshold.

drop of 6 percentage points is less than the drop in the required vote share—11.7 percentage points—dictated by the policy. Relatedly, there was an increase in the share of proposed bonds that passed, seen as the increase in the mass of the curves above their respective vote share thresholds. Appendix Figure A1 shows the cumulative density functions of vote shares separately by year and shows a clear jump following the 2001 legislation.

Panel b) of Figure 1 shows the number of local education-related general obligation bonds proposed and passed under these provisions each year. There is a clear change in 2001, after the new policy took effect: the number of proposed and passed bonds increases and they become more concentrated in even years.[8] This is consistent with the accompanying legislation that restricts when the referendum could occur. Since most statewide and regularly scheduled local elections take place in even years, most education bonds are proposed in even years to qualify for the reduced threshold. Of those proposed in odd years after Proposition 39, most, but not all, are in regularly scheduled local elections and are eligible for the reduced threshold.

Figure 1: Vote Share Density and Number of Proposed and Passed Education GO Bonds, 1995-2016



Notes. Panel (a) includes general obligation bonds by K-12 school districts and community colleges. Each line represents the density function for measures in the stated year range. The solid vertical bar, at 0.67, represents the vote threshold for the measures in 1996-2000, the solid curve. The dashed vertical bar, at 0.55, represents the vote threshold for the measures after 2001 due to the passage of Proposition 39. Panel b) shows general obligation bonds by K-12 school districts and community colleges from data described in section 3.

Since general elections have much larger turnout than primary and special elections, the shift to general elections may have substantially altered the composition of voters. Proposition 39's

[8]Appendix Figure A2 shows proposed and passed bonds among non-education governments, analogous to Figure 1, with no clear change around the time of the policy. Appendix Figure A3 shows proposed and approved dollars of bond funding, for both types of governments, with similar conclusions. Appendix Figure A4 shows the mean vote share for GO bonds across treated and control groups.

requirements only applied to education-related bonds and not other measures, so the effects we present in this paper include the effects of the change in the threshold and the change in voter composition.

The change in the composition of voters could have affected the level of approved spending and the vote share that any given proposal would receive, but it is not clear in which direction. On the one hand, if moving to a general election had a positive effect on votes for referenda, then officials would have had an incentive to put measures on general election ballots even before the policy change. However, we observe many referenda in primary and special elections prior to the policy change. On the other hand, as Kogan, Lavertu and Peskowitz (2018) note, there are competing theories regarding the effects of low-turnout elections on support for public spending. Consequently, elected officials may have had differing opinions. They show that referenda in general elections in California were more likely to prevail than those in other elections. Our data confirm this when limited to the period prior to Proposition 39, when the vote threshold did not vary with the timing. Thus, the shift to general elections may have influenced voting outcomes in either direction. We return to this question when we discuss our results in Section 6.4.

3 Conceptual Framework

Before describing the quantitative estimates of the effect of Proposition 39, we turn to a disagreement voting model to explore the implications of the policy change. The model shows how a change in the vote share required to pass a funding referendum can change the funding amounts that local politicians will propose, the probability that those referenda will prevail, and the resulting funding. In this section, we outline the model and describe the main results. Derivations and further details of the model are in Appendix Section A2.

Our model builds on the framework developed by Romer and Rosenthal (1979, 1978, 1982), who study the interaction between a bureaucrat with agenda setting powers and voters who must approve their decisions in referenda. We extend this model by studying the role of the voting thresholds that referenda are required to achieve. In this, our model is similar to Brunner and Ross (2010) who study voting behavior on Proposition 39 itself.[9]

[9]However, since their model concentrates on voter preferences over the proposition, it abstracts from how the resulting change would affect the proposal and voting process on particular proposals. Instead, Brunner and Ross (2010)

Our model considers the interaction between voters and a representative politician in setting a local government's expenditure on a public good. There is a status quo level of funding, denoted g. The politician has the option to make a proposal for additional spending on the public good. If the politician makes no proposal or if the proposal fails to receive the required support among voters, the status quo level of funding is implemented.

The voters desire a certain level of funding, denoted θ. The voter utility reflects their opinion on the value of the public good and the cost of the taxes that would be necessary to fund it. We assume voter utility declines symmetrically as the funding level diverges from the ideal point, with quadratic distance policy preferences given by $-(g-\theta)^2$.

We assume the politician's ideal funding is at least as much as what the voter's desire. The politician's ideal level is $\theta + b$, where b represents the disagreement between the politician and the voters. We assume that b is non-negative, which is consistent with the common justification of referendum requirements, that limiting the politician's authority will lower spending. When b is equal to zero there is no disagreement. As with the voters, the politician has preferences, $-(g-\theta-b)^2$ that are symmetric in the distance of the funding level from their ideal level of funding.

The sequence of events in the model is as follows. First, the politician chooses whether to propose a referendum to adopt a public good level g' rather than the reversion level, g. Should they decide against proposing a referendum, the reversion level is adopted. Conversely, if they propose a referendum, the voters then vote yes or no. If at least v share of voters vote in favor then g' is adopted, where v is the vote share requirement, the focus of this paper. Otherwise, the status quo g is adopted. We assume that v is at least one half. Further, we assume that the politician's preferred level of the public good, $\theta + b$, exceeds g. In order to introduce uncertainty in the outcomes of proposals, and hence allow the model to rationalize failed proposals, we assume that there are shocks to the voter preferences that the politician does not know at the time they make proposals. The probability that proposal g' will prevail given the vote share required is $p(g';v)$. Since politicians are uncertain whether any proposal they make would pass, they will choose their proposal so as to maximize their expected utility over the possible outcomes.

The policy change we study empirically is equivalent to a change in the vote requirement, v.

summarize the model with two parameters that capture the difference in preferences between voters at differing points in the distribution. We directly model the proposal and referendum process under differing voting thresholds.

We are interested in how changing v alters the proposed level of investment ($g' - g$), its likelihood of success ($p(g'; v)$), and the resulting public good levels, which we describe as the expected level of investment, $p(g'; v)(g' - g)$.[10]

Table 1: Effect of decreased voteshare with varying disagreement between politician and voters

Outcome	Zero disagreement	Positive disagreement
Proposed investment ($g' - g$)	0	+
Expected vote share in favor	0	-
Probability of Passage ($p(g'; v)$)	+	+
Expected investment ($p(g'; v)(g' - g)$)	+	+

Note: Positive disagreement implies that the politician prefers higher levels of spending than the voter. Zero disagreement implies that they prefer the same level. As described in the text, we assume that the politician always prefers at least as much spending as the voters.

Table 1 describes the effect of a decrease in the vote requirement on each outcome when there is and is not disagreement between voters and the politician on the optimal level of provision. When the politician and voters prefer the same level of spending, a decrease in the threshold does not change the proposal or the fraction of votes in favor. Nevertheless, the probability of the proposal prevailing will increase and, as a result, the expected level of investment will also increase. When the politician prefers higher spending than the voter, a decrease in the threshold will result in larger proposals and, consequently, lower vote shares in favor. However, since the threshold is lower, the probability that the proposal prevails increases, leading to an increase in investment.

In sum, the model presents a framework for understanding the effect of a change in the vote requirement on the behavior of local politicians and voters. It shows how the policy change that we study affects the proposals made by politicians and how voters will vote on them. It has clear predictions for the importance of disagreement between voters and elected politicians.

4 Data

We combine various sources of administrative and publicly available data on all public schools in California over the past two decades. Our main source of data is the set of all election results

[10] In this context, $g' - g$ is the proposed investment and g is the depreciated existing capital stock that would exist if the proposal fails

for all local measures in California between 1995 and 2016. These data, similar to what Cellini, Ferreira and Rothstein (2010) and others have used, come from the California Election Data Archive (CEDA), a project of the Center for California Studies at California State University, Sacramento. We include elections from counties, municipalities, community college districts, and K-12 school districts. Our set of measures includes all those that would have authorized new, increased, or renewed taxes. Our main estimates are limited to only general obligation bonds, but we include other funding measures in robustness checks.[11]

For each measure in the CEDA dataset, we observe the full text of the ballot question, which includes the proposed dollar amounts for general obligation bonds. We also observe whether the measure passed and the number of votes for and against, from which we calculate the share of voters who voted for passage. During the period we study there were 4,520 tax-related measures. There are ten different types of measures included among these: GO bonds, other bonds, business taxes, overrides of the Gann limit, Mello/Roos bonds, parcel taxes, sales taxes, transient occupancy (hotel) taxes, and utility taxes. Of all the measures, 2,075 (46%) were for GO bonds, which are the main measure we focus on in the primary analyses.

We complement the CEDA dataset with other sources of publicly available information. We use school and district-level information on student demographics and proficiency on standardized tests from the Common Core of Data. We use Decennial Census information from 2000 for population counts, demographics, and socioeconomic characteristics of each local jurisdiction. Counts from the Census are readily available for counties, municipalities, and school districts. Census tabulations are not available for community college districts, however. To produce counts of the number of residents in a community college district, we overlaid their current boundaries, available from the Foundation for California Community Colleges, with a map of Census tracts. We then estimated the proportional overlap of tract-level population with the college districts.[12]

In sum, we create two analysis datasets. The first is a "jurisdiction-level" panel dataset. This panel consists of 1,589 jurisdiction-year observations from 1995 to 2016, comprising 977 K-12

[11] A notable omission from this dataset is the set of elections at special districts. These are available from another source, the California Debt and Investment Advisory Commission (CDIAC), but this dataset omits odd year elections prior to 2001, making it unusable for studying the effects of Proposition 39.

[12] Community college districts are not coterminous with Census tracts. Tracts that overlap multiple districts contribute population to the districts in proportion to the area in each district. A limitation of this approach is that large differences in population density within a tract would produce measurement error in district populations.

districts, 482 cities, 72 community college districts, and 58 counties. For each observation, we observe the number of relevant elections held and passed, the number of GO bonds proposed and approved, and the amount of GO funding per capita proposed and approved.

The second dataset is an "election-level" dataset with the full set of 4,520 elections between 1995 and 2016. For these, we observe the jurisdiction, purpose, and vote share. Notably, this dataset includes GO bonds as well as the nine other types of measures.

Table 2 shows summary statistics of the jurisdiction-level panel, by jurisdiction type, prior to the passage of Proposition 39. Between 1995 and 2000, almost half of the school districts proposed a GO bond, as did one fifth of community college districts. The other jurisdictions in the sample—cities and counties—were much less likely to propose this type of funding. This makes sense given that these jurisdictions have a wider set of fundraising tools than school and community college districts. On the other hand, cities and counties were much more likely to put other types of funding proposals, primarily changes in parcel taxes, on the ballot. Passage rates of GO bonds and other elections did not vary across jurisdiction type. Education-related GO bonds tended to be much larger than the GO bonds proposed by counties and cities.

Table 2: Summary Statistics

	(1) School Districts	(2) Community Colleges	(3) Cities	(4) Counties
Proposed GO Bond	0.401	0.194	0.0543	0.0517
Passed GO Bond	0.306	0.0972	0.0397	0.0172
Proposed Other Funding Election	0.0655	0	0.436	0.707
Passed Other Funding Election	0.0440	0	0.255	0.397
Proposed Bond Size ($million)	3.837	4.918	0.691	2.603
Proposed Bond Size ($ per Resident)	90.76	9.171	4.559	3.949
Passed Bond Size ($million)	2.091	1.744	0.535	1.869
Passed Bond Size ($ per Resident)	39.56	4.236	3.322	2.406
Population (1,000)	44.54	470.3	57.89	584.0
Count	977	72	479	58

Note: Data for election behavior spans 1995-2000. GO Bonds refer to general obligation bonds. Population data come from the 2000 Census. Counts of the number of residents in a community college district were constructed by overlaying their current boundaries with a map of Census tracts, and then calculating the proportional overlap.

5 Empirical Approach

In this section, we describe our strategy to empirically investigate the effect of the change in vote requirements on the spending proposals made by the governments, the support the spending proposals received from voters, and the resulting capital spending of local governments. We use a difference-in-differences strategy to identify all effects. However, they require two different types of datasets. We first describe the unconditional approach, which we use to answer the questions regarding government proposals and funding outcomes. We then describe the approach we use to answer questions regarding voting, which conditions on local governments that proposed a bond.

5.1 Estimating effects on government behavior and funding outcomes

The reduced vote requirement applied to school districts and community college districts. Other types of local governments that can issue bonds and levy taxes—counties, municipalities, and special districts—were unaffected. The primary empirical specification takes the regression form

$$Y_{it} = \alpha + \beta(education_i * post_t) + \nu_t + \gamma_i + \varepsilon_{it}, \tag{1}$$

where Y_{it} is the outcome in government i, in year t, $education_i$ is a binary variable indicating whether the government is an education provider and hence affected by the policy change, $post_t$ is a binary variable equal to one when the year is 2001 or later, ν_t represents year fixed effects, and γ_i represents government fixed effects. Some specifications replace the year fixed effects with separate year fixed effects for each county. Under the typical difference-in-differences common trends assumption that absent the policy change, the outcome would have evolved the same in school and community college districts as it did in counties and municipalities, β represents the causal effect of the reduction in the vote requirement. In this setting, the common trends assumption requires that educational districts on average experience the same year to year shocks that drive capital investment as counties and municipalities. If the demand for public services in general drives these shocks, perhaps due to population growth, then this would be a reasonable assumption. Specifications containing separate year fixed effects for each county restrict this comparison to within each county. We discuss threats to this assumption in Sections 6.4 and 6.6 when we present

results.

We consider this an *unconditional* analysis because the specification in Equation 1 includes all jurisdictions, whether or not they made a proposal that year. We use this specification to estimate the effect of the policy change on the likelihood of proposing and passing GO bonds following the policy change, as well as the total amount of proposed and approved funding per capita. To estimate these effects, we use our jurisdiction-level panel, described earlier, which has data on 1,589 jurisdictions from 1995 to 2016.

5.2 Estimating effects on election outcomes

In order to examine the mechanism through which these changes are occurring, we also estimate several models which condition on a referendum being held. In these models, we continue to employ a difference-in-difference design, but the level of observation is a proposed tax-related measure rather than a government. These take the similar regression form,

$$Y_{imt} = \alpha + \gamma(education_m * post_t) + \xi_t + \zeta_i + u_{imt}, \tag{2}$$

where Y_{imt} is the outcome for voted measure m which took place in government i and year t, $education_m$ is a binary variable equal to one if measure m took place in a school district or community college and all other variables are the same as in Equation 1. Again, standard errors permit clustering at the government level to allow for serial correlation.

We use this conditional analysis to examine the effect of the policy change on two outcomes: the vote share in favor of the bond and the probability that a bond passes. However, because officials may respond to the policy change by proposing bonds in situations that they would not have prior to the change (in fact this is part of what we test in the unconditional analysis), care must be taken in interpreting them. It would be inappropriate to interpret this analysis as the effect of the policy change on the level of support for increased spending. Instead, it is the effect of the change on the level of support for the proposals that the officials choose to make.

6 Results

We organize the results into three sections. First, we examine whether Proposition 39 changed the proposal behavior of school boards and community college districts in terms of their likelihood of proposing a GO bond, and the size of the proposals. This uses the methods described in Section 5.1. Second, we ask whether the performance of GO bonds from educational jurisdictions changed as a result of Proposition 39. This uses the methods described in Section 5.2. Third, we study the overall effects of Proposition 39 on funding outcomes, which combines the effect on government behavior and the effect on voting outcomes. This again uses the methods described in Section 5.1. After discussing the main results we then move to heterogeneity analysis across jurisdiction types, and robustness checks.

6.1 Government Behavior

We first present the effect of the policy change on the prevalence and size of proposals made by jurisdictions. Table 3 displays the results from regressions of the form described in Equation 1, using the jurisdiction-level panel. The coefficients shown in the table are the differences-in-differences estimates: the interaction between indicators for being an education-related jurisdiction and the post-Proposition 39 years. The first two columns show the effect of Proposition 39 on the likelihood that a jurisdiction would propose a GO bond. The regression shown in column 1 includes year fixed effects and a full vector of government-level fixed effects, while column 2 replaces the year fixed effects with separate year fixed effects for each county to narrow the comparison to within county differences between education and non-education governments. In both columns, the estimate is small and not statistically significant: overall, education jurisdictions were not more likely than other jurisdictions to propose bonds after 2001.

Panel a) of Figure 2, however, shows that the story is more complicated. There are large changes in the timing of when GO bonds are proposed. The figure shows estimates of a generalized differences-in-differences model, plotting the difference in the outcome across treated and untreated jurisdictions in each calendar year, and controlling for jurisdiction fixed effects. One of the stipulations of Proposition 39 is that to qualify for the lower vote threshold, governments could not hold votes in special elections. Since regularly scheduled elections are typically in even years,

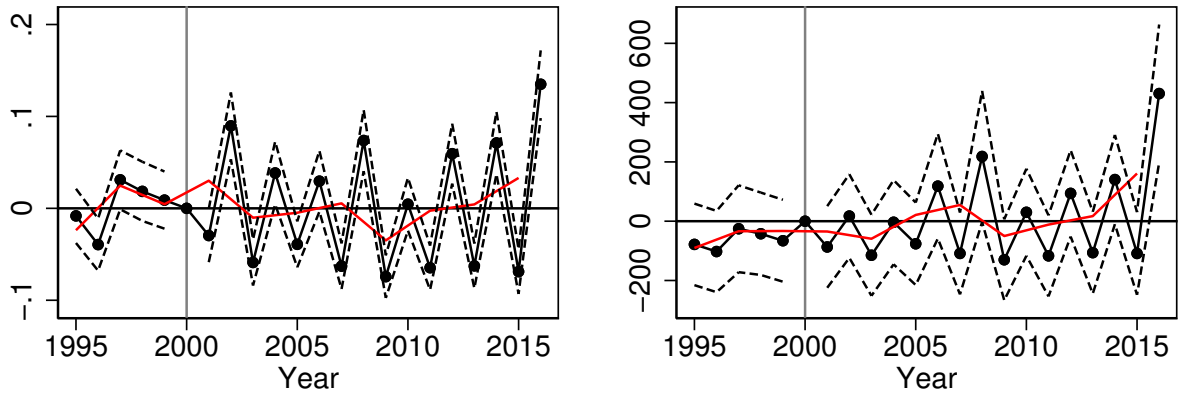
Table 3: Effect of Proposition 39 on Jurisdiction-Level Proposal Behavior

	(1)	(2)	(3)	(4)
	Proposed Bond		Proposed $/Resident	
Post x Treat	0.00205	0.000753	48.44*	64.69***
	(0.00424)	(0.00458)	(22.21)	(17.83)
Y-Mean	0.0549	0.0547	82.27	82.28
N	34892	34826	34672	34606
R-sq	0.110	0.147	0.0732	0.122
Govt. FE	X	X	X	X
Year FE	X		X	
Year X County FE		X		X

Note: Estimates of the effect of decreasing the vote share requirement estimated according to Equation 1. Each observation represents a government in a particular year. The outcome in columns 1 and 2 is an indicator for whether the government proposed a GO bond that year. The outcome in columns 3 and 4 is the dollar amount the government proposed that year divided by the jurisdiction's population in 2000 (zero when no bond is proposed). Standard errors allow for clustering at the government level. * $p < .05$ ** $p < .01$ *** $p < .001$

the jagged shape of the figure is consistent with affected school and community college boards switching the timing of their GO bond proposals in order to qualify for the lower threshold.[13]

Figure 2: Effect on Government Bond Proposal Behavior



a) Proposed bond

b) Proposed $/resident

Note: Estimates of dynamic treatment effect of decreasing the vote share requirement estimated according to Equation 1 but allowing β to differ by year while constraining it to zero in 2000. The outcome in panel a) is an indicator for whether the government proposed a GO bond that year. The outcome in panel b) is the dollar amount of GO bonds the government proposed that year divided by the jurisdiction's population in 2000 (zero when no bond is proposed). The dashed lines illustrate 95% confidence intervals which allow for clustering at the government level.

[13]These effects could come from the treated jurisdictions changing their behavior, but could also come from the untreated jurisdictions also strategically timing their elections. We see no obvious evidence that the pattern of when non-education jurisdictions timed their bonds changed after 2001, as shown in Appendix Figure A2.

Columns 3 and 4 of Table 3 shows the effect of Proposition 39 on the amount of GO bond funding proposed by jurisdictions. The estimate here is statistically significant and large, implying a 59 percent increase in column 3 and a 79 percent increase in column 4.

Panel b) of Figure 2 shows estimates of a generalized differences-in-differences model, plotting the difference in the outcome across treated and untreated jurisdictions in each calendar year, and controlling for jurisdiction fixed effects. The figure again shows the pattern of even and year elections following the policy change. The effect on proposed funding per resident is not significant in most years. In a robustness exercise, described in section 6.6 we show that, omitting all years since 2007, the overall effect on proposed funding does not appear significant.

These estimates combine two opposing effects on the proposal behavior of governments. On the one hand, the policy change makes bonds more likely to pass and hence more attractive to propose. On the other hand, when bonds fail, governments often propose new bonds in subsequent years, so if bonds are more likely to pass it may take fewer proposals before one is passed. These results show that the sum of these two effects resulted in treated jurisdictions proposing a greater sum of total capital spending while being no more or less likely to propose a GO bond. The former effect is, empirically, quite large.

6.2 Election Outcomes

Next, we present results showing the effect of the policy change on the performance of the elections that are proposed. For this analysis we rely on estimates of Equation 2. We use the election dataset, which consists of every election for a funding purpose across the different types of jurisdictions. Treated elections are GO bonds proposed by school and community college districts, and control elections are GO bonds at other districts. The reported estimates show whether the performance of GO bonds differentially changed following the passage of Proposition 39 for education districts relative to funding proposed by other jurisdictions.

Columns 1 and 2 of Table 4 show a decline in vote share, of approximately 5 percentage points. Notably, the confidence interval does not include a decline of 11.7 percentage points, the amount that the vote requirement declined when Proposition changed the requirement from 2/3 to 55 percent. As shown in the previous table, the policy change causes governments to propose more spending, which may decrease the fraction of voters that are willing to support it. However,

the change in the size of proposals—and any other features of the proposal that may have also changed—are not sufficient to drive the vote share down by the full amount of the policy change.

Table 4: Effect of Proposition 39 on Election-Level Results

	(1)	(2)	(3)	(4)
	Election Vote Share		Election Approved	
Post x Treat	-0.0518*	-0.0516*	0.214*	0.214*
	(0.0251)	(0.0254)	(0.0928)	(0.0930)
Y-Mean	0.653	0.653	0.742	0.742
N	2037	2037	2037	2037
R-sq	0.0853	0.0877	0.0823	0.0824
Year FE	X	X	X	X
Govt Type FE		X		X

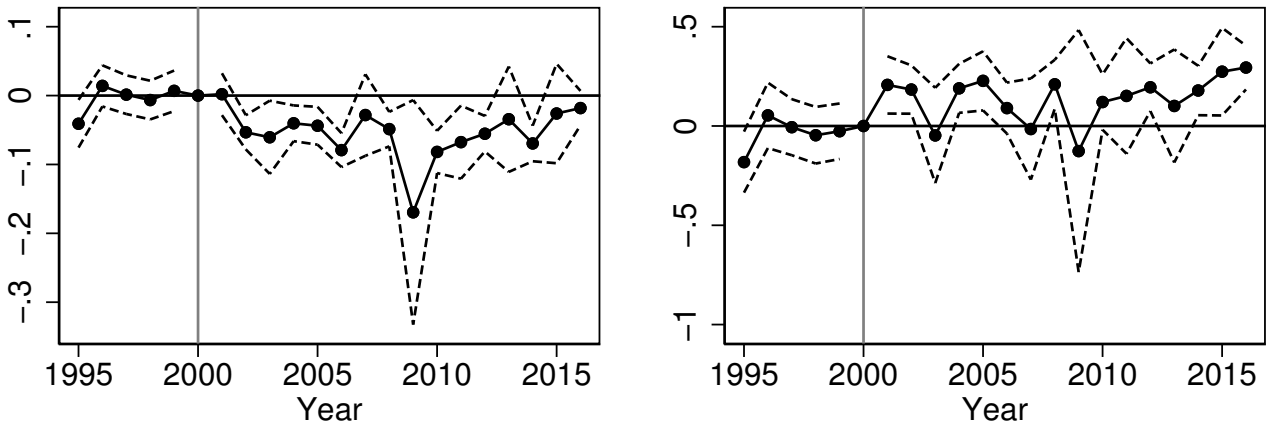
Note: Estimates of the effect of decreasing the vote share requirement estimated according to Equation 2. Each observation represents a proposed GO bond. The outcome in columns 1-3 is the vote share that the bond received. The outcome in columns 4-6 is whether the voters approved the bond. Standard errors allow for clustering at the government level. * $p < .05$ ** $p < .01$ *** $p < .001$

Panel a) of Figure 3 shows the year-by-year progression of vote shares, separately estimating the difference-in-differences coefficient each year in an event study framework. There is a flat trend in the years prior to the passage of Proposition 39, followed by a decrease in 2001 that continues in later years. Apart from a large spike in 2009, a year in which there were few GO bonds proposed, the estimated effect on the vote shares is never larger than the 11.7 percentage point decline in the vote requirement. In fact, the lower bound of the 95% confidence interval is never below the decline either.

The next two columns of Table 4 show the effect of Proposition 39 on the likelihood that a GO bond would pass. We find that an education GO bond was 21 percentage points more likely to pass relative to GO bonds in other jurisdictions. This result is consistent with the decline in the election vote shares being less than the decline in the vote share requirement dictated by Proposition 39. Panel b) of Figure 3 shows the year-by-year progression of passage rates. Again, there is a flat trend in the years prior to the passage of Proposition 39, followed by an increase in 2001 that continues in most years.

Combining these results with those from the previous section, we find that the likelihood of bonds being proposed in the post period remains unchanged, while the probability of their passing (once proposed) has increased. This suggests that the interval between successful bonds is shorter

Figure 3: Effects on Vote Share and Pass Rates of Proposed Bonds



a) Vote Share

b) Pass Rate

Note: Estimates of dynamic treatment effect of decreasing the vote share requirement estimated according to Equation 2 but allowing β to differ by year while constraining it to zero in 2000. The dashed lines illustrate 95% confidence intervals which allow for clustering at the government level.

on average under the new policy. Bonds are proposed just as often, but they are now more likely to pass. This is consistent with the politicians favoring a higher level of spending than the voters do.

6.3 Funding Outcomes

The final set of main results shows the effects of Proposition 39 on fiscal outcomes. How did the change in vote share required to pass an education-related GO bond affect education funding? How did this differ across different governments? Here we turn once again to the jurisdiction-level panel and are interested in outcomes at the jurisdiction level.

The first two columns of Table 5 show that, following the policy change, affected jurisdictions are slightly more likely to pass GO bonds than before. However, panel a) of Figure 4 shows that this small positive effect hides strong positive and negative effects caused by the shifting of GO bond proposals to even-year elections. Overall, however, the effect of jurisdictions changing the timing of their GO bond proposals is a small change in overall GO bond passage rates.

Columns 3 and 4 of Table 5 show that Proposition 39 had a large positive effect on school funding outcomes. We find that bond funding in treated jurisdictions increased by $58-$66 per student, a more than 100% increase. This effect is larger than our estimate of the amount of

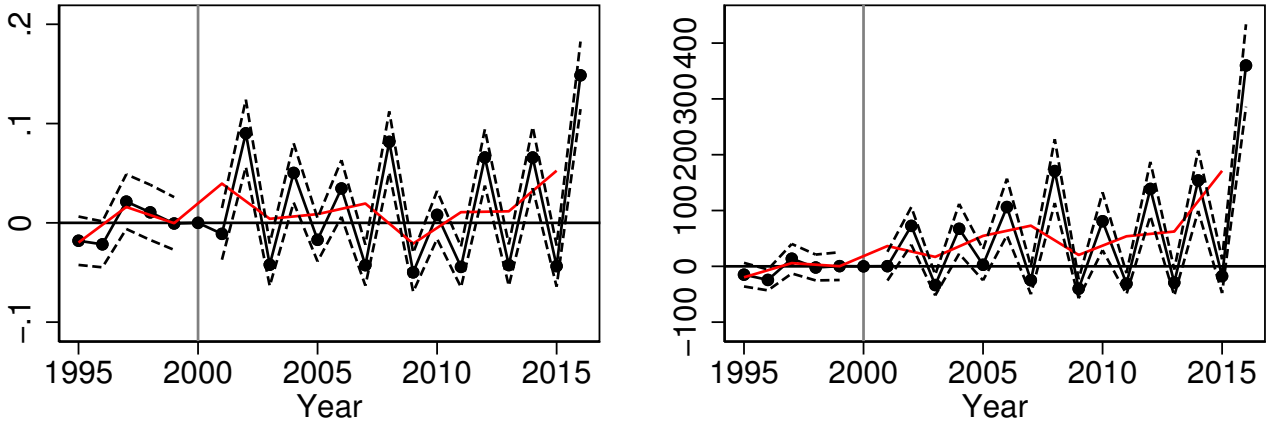
proposed GO bond funding because of the added effect of the increased likelihood of approval. Once again, Panel b) of Figure 4 shows that this positive effect on overall education funding is concentrated in elections occurring in even years.

Table 5: Effect of Proposition 39 on Jurisdiction-Level Funding Outcomes

	(1)	(2)	(3)	(4)
	Approved Bond		Approved $/Resident	
Post x Treat	0.0170***	0.0172***	57.56***	65.63***
	(0.00325)	(0.00361)	(4.929)	(5.406)
Y-Mean	0.0426	0.0425	53.23	53.24
N	34892	34826	34672	34606
R-sq	0.0963	0.133	0.0766	0.112
Govt. FE	X	X	X	X
Year FE	X		X	
Year X County FE		X		X

Note: Estimates of the effect of decreasing the vote share requirement estimated according to Equation 1. Each observation represents a government in a particular year. The outcome in columns 1 and 2 is an indicator for whether the government proposed *and passed* a GO bond that year. The outcome in columns 3 and 4 is the dollar amount the government proposed *and passed* that year divided by the jurisdiction's population in 2000 (zero when no bond is passed). Standard errors allow for clustering at the government level. * $p < .05$ ** $p < .01$ *** $p < .001$

Figure 4: Effect on government level outcomes



a) Bond passed

b) Approved $/Resident

Note: Estimates of dynamic treatment effect of decreasing the vote share requirement estimated according to Equation 1 but allowing β to differ by year while constraining it to zero in 2000. The outcome in panel a) is an indicator for whether the government proposed *and passed* one or more GO bonds that year. The outcome in panel b) is the dollar amount of bonds proposed *and passed* divided by the jurisdiction's population in 2000 (zero when no bond passed). The dashed lines illustrate 95% confidence intervals which allow for clustering at the government level.

6.4 Interpretation of Main Results

In the preceding sections we show that the policy affected several outcomes. There was no effect on whether a bond was proposed, but an increase in the total amount of funding proposed. For those places that did make proposals, the vote share declined but the probability of passage rose. These effects combined to result in an increase in bonds approved and an increase in total funding approved.

Overall, our results are consistent with the decreased vote share requirement being the primary mechanism driving the effects. As discussed in Section 2.2, Proposition 39 changed the vote share requirement but only if the referenda did not occur during a spcial election, which had been common previously. The resulting change to the timing of the referenda likely affected the composition of voters in referenda. This could have either increased or decreased the desired spending of the voters voting on the proposals. If the level of spending voters were willing to approve declined, then vote shares, passage rates, proposed funding and approved funding would all decline, and vice versa. That is inconsistent with the effects we find, which are not all in the same direction.

In Appendix Table A1, we include controls for the timing of the election itself. The first two and last two columns of the table replace the year fixed effects in the unconditional sample with dummies for whether a year was a midterm or a presidential year, with the omitted category being odd years, with very similar results.[14] Columns 3-6 of the table accounts for election timing in the conditional sample in two different ways: by replacing the year effects with midterm and presidential dummies, and by keeping the year effects and adding a dummy for whether the election was in November. Once again, the results are quite similar.

However, the results presented in the preceding sections are consistent with the anticipated effects of a change in the vote share when school boards prefer higher spending than voters. Our estimates show that vote shares decreased following the change, even as funding increased. Our results fit these predictions: we see an increased in proposed investment, a decrease in vote shares, an increase in the probability of passage, and an increase in approved investment.

[14] Because the unconditional jurisdiction-level sample aggregates elections to the annual level, we cannot differentiate between general elections and special or primary election timing.

6.5 Heterogeneity in Responses to the Policy Change

We next turn to examining heterogeneity in the effects across jurisdictions with different characteristics. We do not have a way to causally estimate the effect of any particular jurisdiction characteristic on the extent of response to Proposition 30. Nevertheless, we believe this exercise serves two primary aims.

First, our theoretical model suggested that the responsiveness of a jurisdiction to a decrease in the vote share threshold varies by the extent of the disagreement between voters and their representatives, as well as with the magnitude of the elected official's uncertainty over how the citizens will vote. Thus, studying the heterogeneity of effects tells us what types of jurisdictions have relatively large disagreement and uncertainty. Note that the disagreement between voters and representatives is not necessarily the same as party affiliation or political ideology. Rather, we are interested in the extent to which there is diversity within the jurisdiction.

Second, from a practical policy perspective this analysis tells us in what types of jurisdictions residents experienced the largest change in funding due to the policy change. This indicates places in which restraints on the decision-making of elected officials decrease spending the most. We show heterogeneity results based on the race and ethnicity of residents, the poverty rate, the fraction of older residents, and the level of funding under the prior policy regime.

The first type of heterogeneity we investigate is racial and ethnic diversity in the jurisdiction. Alesina, Baqir and Easterly (1999) argue that diverse places create disagreement over the type of public goods desired and as a result disagreement over the amount of any particular type of public goods. Once a bond has been proposed, the types of public goods have effectively been decided, so this theory suggests that more diversity may result in more disagreement between voters and officials. As a measure of a jurisdiction's diversity, we focus on the racial and ethnic fractionalization of its population (Alesina et al., 2003). This type of measure is commonly used in the literature (Boustan et al., 2013), and is meant to reflect the probability that two randomly chosen people in a jurisdiction will belong to different groups. Fractionalization is defined as

$$F_i = 1 - \sum_{j=1}^{N} s_{ij}^2, \tag{3}$$

where s_{ij} is the share of group j in jurisdiction i. We construct our measure using the shares of the jurisdiction that were white, Black, Latino, and Asian, as well as the combined share of all other groups, based on the 2000 Census.

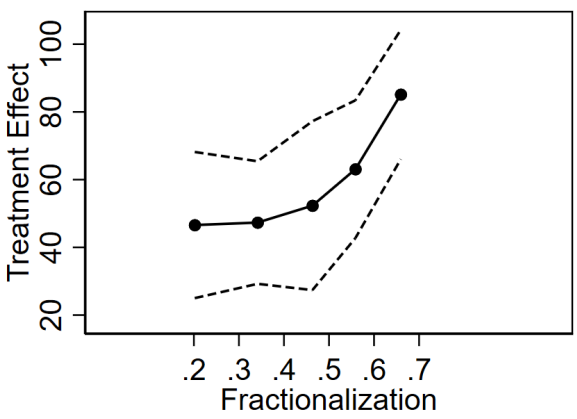
We are interested in whether the effects of Proposition 39 differ by the fractionalization of the jurisdiction. We re-estimate Equation 1, the effect of Proposition 39 on unconditional jurisdiction-level outcomes, and allow the treatment effect on the level of funding to differ with quintiles of the fractionalization index measured in the year 2000. Panel a) of Figure 5 plots the coefficient estimates for each quintile, with the horizontal axis being the mean fractionalization in that quintile. The upward slope suggests that districts with the lowest fractionalization—the most homogeneous districts—are the ones where the likelihood of bond passage and funding was least affected by the loosening of the electoral constraint.

On the other hand, the most fractionalized districts had the highest treatment effects. Jurisdictions in the highest quintile of fractionalization saw almost $40 per resident larger increases in funding due to Proposition 39.[15] Appendix Table A2 shows similar results, where the effect differs only by whether the jurisdiction's fractionalization index was above or below the median level in the year 2000. The results show no statistically significant difference between high and low fractionalization jurisdictions in the effect on proposing bonds, but the policy change had a larger effect on the amount of funding approved by high fractionalization places. These results suggest that the effects shown in the previous sections are in general concentrated in districts with high fractionalization.

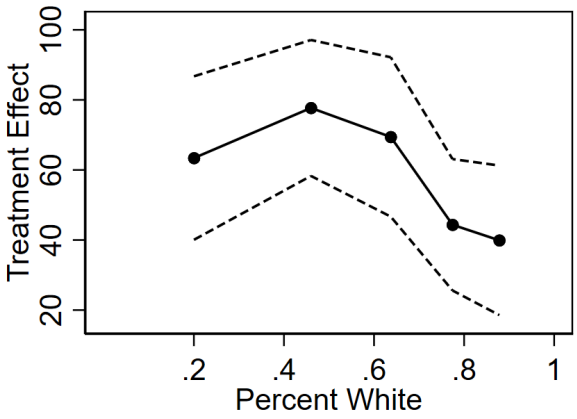
Fractionalization measures diversity, but it does not differentiate between homogeneous jurisdictions of different races or ethnicities, which may have had very different funding experiences. The second panel of Figure 5 shows results by quintiles of the non-Hispanic white share of the population. Jurisdictions in the top quintile necessarily have low levels of fractionalization, but those in the bottom quintile could have low or high levels of fractionalization, depending on whether one group comprises the majority of the non-white population. The figures show that the largest effects of Proposition 39 are in jurisdictions in the middle of the distribution of the white population share. Since these jurisdictions must have relatively high fractionalization, these two

[15] We present the heterogeneity analysis where the outcome is the dollar amount of approved bond funding. Appendix Figure A6 shows the same analysis, where the outcome variable is instead whether the jurisdiction passed any bond funding. The patterns are similar.

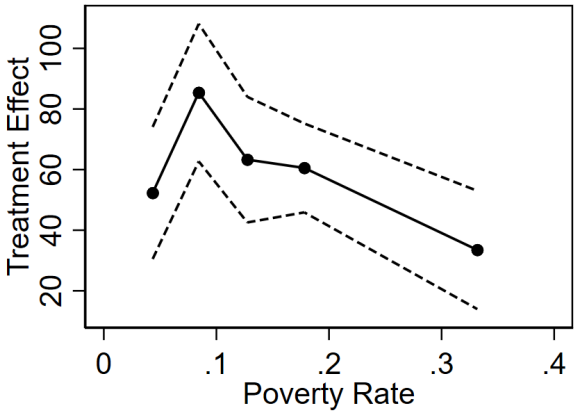
Figure 5: Heterogeneity in Effect of Proposition 39 on Jurisdiction-Level Approved Capital Funding Per Resident



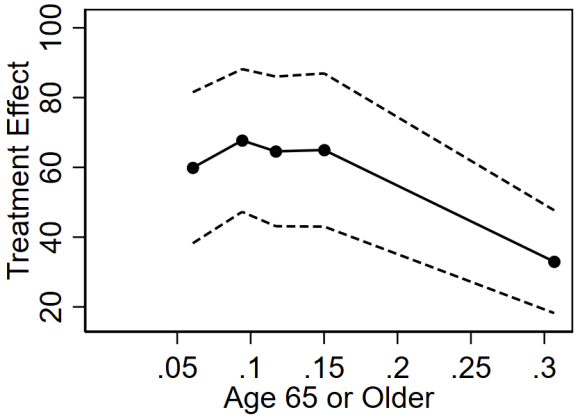
a) Racial Fractionalization



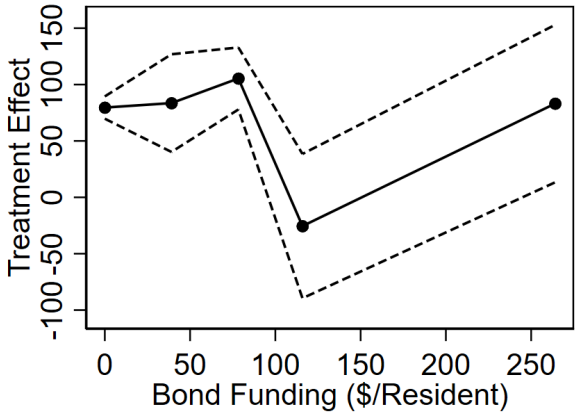
b) Percent White



c)Poverty Rate



d) Percent Age 65+



e) Pre-2001 Bond Funding

Note: Estimates of the effect of decreasing the vote share requirement on the dollar amount of bonds passed divided by the jurisdiction's population in 2000 (zero when no bond passed), estimated according to Equation 1 but where β is allowed to differ by the characteristic corresponding to that panel. In panels a) through d) β is allowed to differ by quintiles of the characteristic (measured in 2000) while in panel e) it is allowed to differ by quartile of 1995-2001 bond funding, if positive, or zero bond funding. The average values of the characteristic within each group are shown on the horizontal axes. The dashed lines illustrate 95% confidence intervals which allow for clustering at the government level.

sets of results are consistent. [16]

Panel c) of Figure 5 shows estimates of Equation 1 at quintiles of the poverty rate.[17] Proposition 39 had the largest effect on jurisdictions with moderate levels of poverty. The difference between the first and second quintiles is statistically significantly different for both outcomes.

Another facet of heterogeneity we consider is in the age distribution of the jurisdiction. Older and senior citizens consistently have the highest rates of voter turnout (McDonald, 2017). These voters tend to be more fiscally conservative, and since they are less likely to have children in school might also be less likely to vote for taxes aimed at expensive school construction projects. On the other hand, this effect could be counteracted by the fact that school improvements can be capitalized into higher housing prices. Panel d) of Figure 5 shows how estimates of Equation 1 vary by quintiles of the share of the jurisdiction that is over 65. There is a downward trend, with the oldest jurisdictions experiencing smaller treatment effects. The difference between the first and fifth quintiles is statistically significant.

In the final heterogeneity analysis, shown in panel e), we explore whether Proposition 39 had larger effects among jurisdictions with lower levels of capital spending prior to the policy change. Because many jurisdictions did not approve any funding in the years of data we have, we grouped jurisdictions with positive levels of approved bond funding into quartiles, and the zero funding jurisdictions as the remaining group. The panel e) of Figure 5 shows these results. There is no clear relationship between pre-existing funding levels and the effects of Proposition 39.

An alternative way of approaching this question is to ask whether Proposition 39 narrowed the funding gap between the groups described by panels a) through d) of Figure 5. Appendix Figure A7 shows the means by quintile of approved funding in the period prior to the policy change. In that time, there is no clear relationship between the amount of funding passed and fractionalization. So, while Proposition 39 led to a larger increase in funding in diverse areas, these are not in general jurisdictions with particularly low funding. Turning to the heterogeneity by poverty rate, low poverty jurisdictions were the most likely to pass bonds and approve the largest amount of spending prior to the policy change. Since the policy change's effects were smallest among the

[16] Appendix Figures A8-A10 show analogous figures for the Black, Latino, and Asian populations. The figure for the Latino population has a similar hump shape as for the white population. The figures for Black and Asian populations are less conclusive, most likely because there are few jurisdictions with majority Black or Asian populations.

[17] Unfortunately, measures of income inequality, which would be more directly tied to the hypothesis about funding diversity, are not available for all the geographies in our sample.

highest poverty jurisdictions, it did nothing to reduce the approximately $50 per resident gap between the highest-poverty and lowest-poverty jurisdictions in pre-change funding outcomes, and actually increased it slightly. However, Proposition 39 did close the gap between the lowest-poverty areas and the second quintile, more than closing a gap of approximately $30.

We do not claim that the relationship between the demographics, poverty rate, or prior funding levels of jurisdictions and the effect sizes is causal. A jurisdiction's demographic composition is correlated with other features of its population, such as income and political partisanship. Racial and ethnic fractionalization and income are correlated, and also correlated with other district characteristics. For instance, more fractionalized and poorer jurisdictions tend to be larger. Appendix Figure A11 shows similar heterogeneity estimates for jurisdiction size and Appendix Figure A12 shows the correlation between these characteristics. Instead, these analyses help describe what types of jurisdictions the policy change affected more.

Proposition 39 had the largest impact in jurisdictions that are more ethnically or racially diverse, have moderate levels of poverty and whiteness, and fewer older residents. Making it easier for education-related governments to pass bond proposals resulted in the largest increases in funding in those places,.

6.6 Robustness Checks

In addition to the sensitivity checks we have already described; we perform a few other robustness exercises. First, we drop community colleges from the sample. Community colleges make up a small share of the treated jurisdictions and may be less independent than individual school districts. Appendix Table A3 shows the main results, for both the jurisdiction-level and election-level panels, excluding community colleges. The results are almost identical.

As another robustness exercise, we limit the sample to years before 2006, allowing for only five years after the policy. The purpose of this specification is to look at the short-term effects of the policy. Moreover, there is evidence in some of the event study figures that the effects are more pronounced in later years. Appendix Table A4 shows these results, which are largely consistent with the main specification. The effect of the policy on the amount of funding proposed is smaller and only statistically significant at the 10 percent level. This is consistent with Figure 2, which showed that the largest effect on funding was in 2008 and 2016. The effect on vote share is also

somewhat smaller. However, the large positive increases in the probability of passing a bond and in the amount of approved funding persist under this specification.

New recent work on difference in differences designs has pointed out the sensitivity of estimates to specification choices (Roth and Sant'Anna, 2023). In particular, the parallel trends assumption may hold with one specification of the outcome variable but not with a monotone transformation of it. In our main specifications we define the probability of proposing or passing a GO bond in a linear probability model, and present funding outcomes in dollars per resident. Appendix Figure A16 shows estimates of the pre-period effects where the outcome variables are specificed as log(x+1) or the inverse hyperbolic sine. There are widely known problems with both of these monotone transformations, especially in contexts like ours where there are many zeroes since so many jurisdictions do not propose or pass any funding in some years (Mullahy and Norton, 2022; Chen and Roth, 2024). Nevertheless, the pre-trends look similar to those in the levels specifications of our main results.

One way that school boards could have responded to Proposition 39 is by moving towards bonds and away from other types of funding, such as parcel taxes. Appendix Table A5 shows that, in fact, there is a decrease in approved non-bond taxes following passage, though no effect on the proposal of new taxes. The third and fourth columns show that, overall, there was no effect on the net proposal of new bonds or taxes. Similarly, Appendix Table A6 shows that, when we include taxes into the election-level sample, we still find a decline in the vote share and a positive yet not statistically significant effect on passage. This is an interesting result, but we advise caution in concluding that school boards merely replaced their taxes with bonds. Tax proposals are much less frequent than bond proposals. Appendix Figure A13 shows that, prior to Proposition 39, there were only approximately 10 approved school parcel taxes each year, so it is unlikely that the effect on taxes would outweigh the effect on bonds that we observe. Moreover, even if one interprets this finding as no net change in proposals, because of how funds can be spent the decline in taxes and the rise in bonds means that school boards replaced their funding for current expenditures with funding for capital investments.

Districts could also have moved their additional revenue for capital funding to non-capital causes like instructional and other current expenditures. Appendix Figure A14 shows total and current expenditures from the CCD, net of district fixed effects. We see no break in the trends that

would support such an interpretation.

Throughout, we have shown results that are unweighted, treating jurisdictions of different sizes equally. Appendix Table A7 shows our main estimates, weighting by the population in each jurisdiction. The results are largely the same as our main results; however, there is a larger though still not statistically significant estimate of the effect on proposing any GO bond. This difference leads to a larger point estimate on the effect we find on approving a GO bond, and thus also the approved dollars per capita. Our weighted estimate of the effect of Proposition 39 on approved bond dollars per resident can be interpreted as the person-level average effects of the policy change.

As mentioned in Section 2, state funding for education facilities changed in two important ways around the time of Proposition 39. These have different implications for our estimates. First, in 2002, one year after the policy change we study, the state created the Critically Overcrowded Schools Program, which funded construction in some school districts. The program funded school facility projects in districts that had schools that exceeded a set level of the number of students per acre. It is important to address whether this program drives our heterogeneity estimates since eligible schools were often in districts serving higher shares of low-income students (Brunner, 2006). We obtained a list of eligible schools from the California Department of Education and excluded the 49 school districts with any eligible schools from the analysis. The results are nearly unchanged from the main results already presented, suggesting that the heterogeneous effects are not driven by this program. These results are presented in Appendix Tables A8 and A9 and Appendix Figure A15.

The state also created revised programs for funding new construction and school modernization beginning in 1998. These programs made state matching funds for school facilities easier to access and may have encouraged school boards to propose bonds. While access to these funds also have eligibility rules, there is no centralized list of all eligible schools or districts, so it is not possible to directly account for them in our analysis. Our estimates likely incorporate some effects of these increases in the availability of state funds, to the extent there are any. However, the timing and nature of our results are consistent with Proposition 39 playing a major role. We see no effect or trend in either the bonds proposed or approved between 1999 and 2001, the years in which the revised state funding program was in effect but Proposition 39 had not yet been implemented. In fact, we see no total effect on whether bonds are proposed over our entire sample period. This is

not consistent with school boards seeking to take advantage of larger state funding by proposing bonds when they otherwise wouldn't have. This does not mean that the state funding had no impact on school facilities funding, however. With greater state matching funds available the local bond funding that we study resulted in far more construction funding than in the absence of state matches.

7 Conclusion

In this paper, we analyze how a constitutional change to the voting threshold required for passing a school bond in California affected the share of voters who supported such bonds. We find that schools more than doubled their bond funding per resident due to the change. In addition, we show that governments were no more likely to propose a measure but are more likely to pass a general obligation bond due to the policy change. School bonds saw a drop of six percentage points in voter support following a decrease in the voting threshold by 11 percentage points from two-thirds to 55 percent.

We interpret these results in the context of a political economy model of the interaction between a voter and an elected official. With no disagreement between voters and elected officials, a lowering of the vote share would not affect the proposals made. It would, however, increase the probability that they prevail. Yet, we do find an increase in both the proposals made and the probability that they prevail. This suggests that there is disagreement between the voters and the elected officials. The elected officials use their expanded flexibility to both request more spending and ensure that it passes with a higher probability. Together these result in a large increase in the amount of funding approved.

We note that our results should be interpreted with some deference to potential spillover effects. School districts share a common property tax base with the overlapping jurisdictions that were not subject to the policy change. Thus, changes in the tax rate imposed by school districts could affect voting behavior in these overlapping jurisdictions. For example, additional capital funding in a school district might make it less likely that voters would support higher tax rates for the city or county in which they live. If that were the case, the estimated treatment effects presented in the paper are the combination of these two effects, not simply the effect on the school districts.

Policies that limit the unilateral power of local elected officials and require tax policies to be approved via referendum are common throughout the United States. We study an incremental change in this requirement and show that it had large effects. Lowering the vote threshold worked as intended and more than doubled funding from GO bonds. However, the policy change did not expand the set of school districts that proposed a GO bond. In that sense, Proposition 39 likely increased funding among districts that would have proposed bonds even without the change. This occurred both because districts whose proposals may have failed saw them succeed and because districts proposed larger bonds.

The policy change did not have equal effects across all jurisdictions. Its effects were concentrated in jurisdictions that were not racially and ethnically homogenous. This suggests that relaxing or removing constraints on local elected leaders increases spending more in places with more diverse populations. Our analysis points to two possible reasons for why this may be. Elected officials in those places may have larger disagreements with referendum voters over their preferred level of spending or have less uncertainty over referendum outcomes.

These results have implications for policy discussions that involve changes to local tax limits. Some states frequently modify the terms of these limits. States change the latitude with which local officials can set policy without a voter referendum, in some cases through annual adjustments to allowable budget increases. States also change the rules for referenda, as in the case studied. Our results suggest that the details of how these policies are designed matter. It can affect the amount of funding that occurs, and hence taxes that residents must pay. Since it deferentially affects jurisdictions with different characteristics, it has important distributional consequences.

References

Aaronson, Daniel, and Bhashkar Mazumder. 2011. "The impact of Rosenwald schools on black achievement." *Journal of Political Economy*, 119(5): 821–888.

Alesina, Alberto, Arnaud Devleeschauwer, William Easterly, Sergio Kurlat, and Romain Wacziarg. 2003. "Fractionalization." *Journal of Economic growth*, 8(2): 155–194.

Alesina, Alberto, Reza Baqir, and William Easterly. 1999. "Public Goods and Ethnic Divisions." *The Quarterly Journal of Economics*, 114(4): 1243–1284.

Anzia, Sarah F. 2011. "Election timing and the electoral influence of interest groups." *The Journal of Politics*, 73(2): 412–427.

Balsdon, Ed, Eric J. Brunner, and Kim Rueben. 2003. "Private demands for public capital: Evidence from school bond referenda." *Journal of Urban Economics*, 54(3): 610–638.

Balsdon, Ed, Eric J. Brunner, Ed Balsdon, and Eric Brunner. 2005. "Can Competition Tame the Leviathan? Evidence From California's Proposition 39." *National Tax Journal*, 58(4): 627–42.

Barseghyan, Levon, and Stephen Coate. 2014. "Bureaucrats, voters, and public investment." *Journal of Public Economics*, 119: 35–48.

Beach, Brian, and Daniel B Jones. 2017. "Gridlock: Ethnic diversity in government and the provision of public goods." *American Economic Journal: Economic Policy*, 9(1): 112–36.

Biasi, Barbara, Julien M Lafortune, and David Schönholzer. 2024. "What Works and for Whom? Effectiveness and Efficiency of School Capital Investments across the US." National Bureau of Economic Research.

Boustan, Leah, Fernando Ferreira, Hernan Winkler, and Eric M. Zolt. 2013. "The Effect of Rising Income Inequality on Taxation and Public Expenditures: Evidence from U.S. Municipalities and School Districts, 1970–2000." *Review of Economics and Statistics*, 95(4): 1291–1302.

Brunner, Eric. 2001. "The Parcel Tax." In *School Finance and California's Master Plan for Education*. , ed. Jon Sonstelie and Peter Richardson, 187–212. Public Policy Institute of California.

Brunner, Eric J. 2006. "Financing school facilities in California." *Getting Down to Facts*.

Brunner, Eric J., and Stephen L. Ross. 2010. "Is the median voter decisive? Evidence from referenda voting patterns." *Journal of Public Economics*, 94(11–12): 898–910.

Cellini, Stephanie Riegg. 2009. "Crowded colleges and college crowd-out: The impact of public subsidies on the two-year college market." *American Economic Journal: Economic Policy*, 1(2): 1–30.

Cellini, Stephanie Riegg, Fernando Ferreira, and Jesse Rothstein. 2010. "The value of school facility investments: Evidence from a dynamic regression discontinuity design." *The Quarterly Journal of Economics*, 125(1): 215–261.

Cerdán, Pedro, and Kim Rueben. 2003. "Fiscal Effects of Voter Approval Requirements on Local Governments."

Chen, Jiafeng, and Jonathan Roth. 2024. "Logs with zeros? Some problems and solutions." *The Quarterly Journal of Economics*, 139(2): 891–936.

Choi, Jinsub. 2019. "The effect of school capital investments on local housing markets and household sorting in California." *Applied Economics*, 51(18): 1989–2000.

Coate, Stephen, and Yanlei Ma. 2017. "Evaluating The Social Optimality Of Durable Public Good Provision Using The Housing Price Response To Public Investment." *International Economic Review*, 58(1): 3–31.

Conlin, Michael, and Paul N Thompson. 2017. "Impacts of new school facility construction: An analysis of a state-financed capital subsidy program in Ohio." *Economics of Education Review*, 59: 13–28.

Crain, W Mark, and James C Miller III. 1989. "Budget process and spending growth." *Wm. & Mary L. Rev.*, 31: 1021.

Dahlberg, Matz, Karin Edmark, and Heléne Lundqvist. 2012. "Ethnic Diversity and Preferences for Redistribution." *Journal of Political Economy*, 120(1): 41–76.

Duflo, Esther. 2001. "Schooling And Labor Market Consequences Of School Construction In Indonesia: Evidence From An Unusual Policy Experiment." *American Economic Review*, 91(4): 795–813.

Dye, Richard F., and Therese J. McGuire. 1997. "The effect of property tax limitation measures on local government fiscal behavior." *Journal of Public Economics*, 66(3): 469–487.

Feld, Lars P, and John G Matsusaka. 2003. "Budget referendums and government spending: evidence from Swiss cantons." *Journal of Public Economics*, 87(12): 2703–2724.

Figlio, David N, and Kim S Rueben. 2001. "Tax limits and the qualifications of new teachers." *Journal of Public Economics*, 80(1): 49–71.

Funk, Patricia, and Christina Gathmann. 2011. "Does direct democracy reduce the size of government? New evidence from historical data, 1890–2000." *The Economic Journal*, 121(557): 1252–1280.

Hong, Kai, and Ron Zimmer. 2016. "Does investing in school capital infrastructure improve student achievement?" *Economics of Education Review*, 53: 143–158.

Jackson, C Kirabo, and Claire L Mackevicius. 2024. "What impacts can we expect from school spending policy? Evidence from evaluations in the United States." *American Economic Journal: Applied Economics*, 16(1): 412–446.

Knight, Brian G. 2000. "Supermajority voting requirements for tax increases: evidence from the states." *Journal of Public Economics*, 76(1): 41–67.

Kogan, Vladimir, Stéphane Lavertu, and Zachary Peskowitz. 2018. "Election Timing, Electorate Composition, and Policy Outcomes: Evidence from School Districts." *American Journal of Political Science*, 62(3): 637–651.

Martorell, Paco, Kevin Stange, and Isaac McFarlin Jr. 2016. "Investing in schools: capital spending, facility conditions, and student achievement." *Journal of Public Economics*, 140: 13–29.

McDonald, Michael. 2017. "United States Election Project (2017)."

Meredith, Marc. 2009. "The strategic timing of direct democracy." *Economics and Politics*, 21(1): 159–177.

Messner, Matthias, and Mattias K Polborn. 2004. "Voting on majority rules." *The Review of Economic Studies*, 71(1): 115–132.

Mullahy, John, and Edward C Norton. 2022. "Why transform Y? A critical assessment of dependent-variable transformations in regression models for skewed and sometimes-zero outcomes." National Bureau of Economic Research.

Mullins, Daniel. 2010. "Fiscal Limitations on Local Choice: the Imposition and Effects of Local Government Tax and Expenditure Limitations." In *State and Local Fiscal Policy: Thinking Outside the Box?*. , ed. Sally Wallace. Nothampton, MA:Edward Elgar.

Neilson, Christopher A, and Seth D Zimmerman. 2014. "The effect of school construction on test scores, school enrollment, and home prices." *Journal of Public Economics*, 120: 18–31.

Park, R Jisung, Joshua Goodman, Michael Hurwitz, and Jonathan Smith. 2020. "Heat and learning." *American Economic Journal: Economic Policy*, 12(2): 306–39.

Persson, Torsten., and Guido Enrico Tabellini. 2000. *Political economics: explaining economic policy*. MIT Press.

Pierog, Karen. 2020. "Pandemic curbs bonds and tax measures on U.S. ballots." *Reuters*.

Poterba, James M., and Kim S. Rueben. 1995. "The Effect of Property-Tax Limits on Wages and Employment in the Local Public Sector." *The American Economic Review*, 85(2): 384–389.

Romer, Thomas, and Howard Rosenthal. 1978. "Political resource allocation, controlled agendas, and the status quo." *Public choice*, 33(4): 27–43.

Romer, Thomas, and Howard Rosenthal. 1979. "Bureaucrats versus voters: On the political economy of resource allocation by direct democracy." *The Quarterly Journal of Economics*, 93(4): 563–587.

Romer, Thomas, and Howard Rosenthal. 1982. "Median voters or budget maximizers: Evidence from school expenditure referenda." *Economic Inquiry*, 20(4): 556–578.

Romer, Thomas, Howard Rosenthal, and Vincent G Munley. 1992. "Economic incentives and political institutions: Spending and voting in school budget referenda." *Journal of public Economics*, 49(1): 1–33.

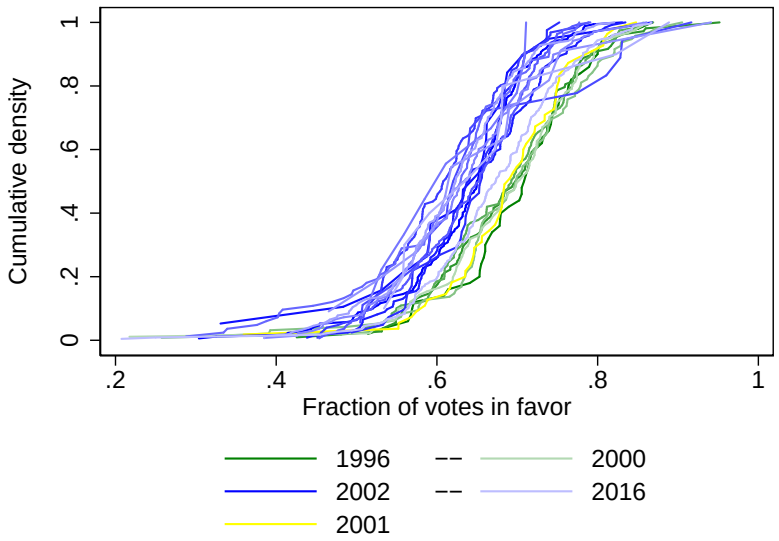
Rose, Shanna. 2010. "Institutions and fiscal sustainability." *National Tax Journal*, 63(4): S807–S807.

Roth, Jonathan, and Pedro HC Sant'Anna. 2023. "When is parallel trends sensitive to functional form?" *Econometrica*, 91(2): 737–747.

Rugh, Jacob S., and Jessica Trounstine. 2011. "The provision of local public goods in diverse communities: Analyzing municipal bond elections." *Journal of Politics*, 73(4): 1038–1050.

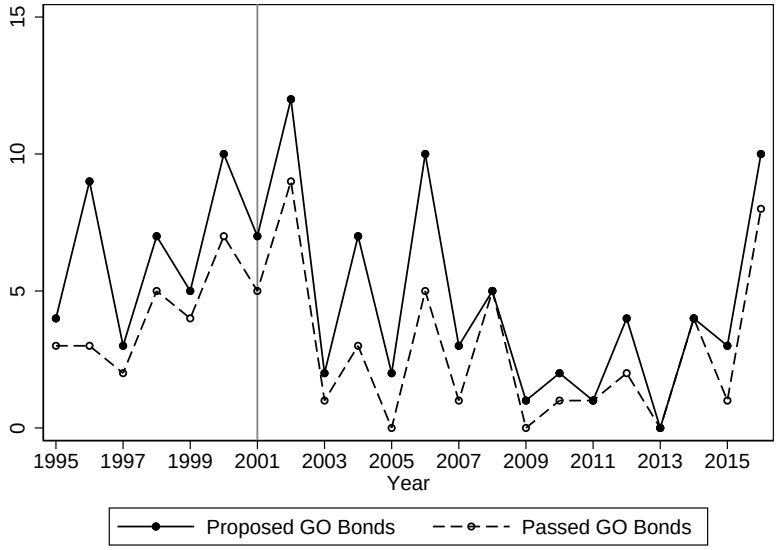
A1 Appendix Figures & Tables

Figure A1: Cumulative Density Functions of Vote Shares for Education GO Bonds, by Year, 1995-2016



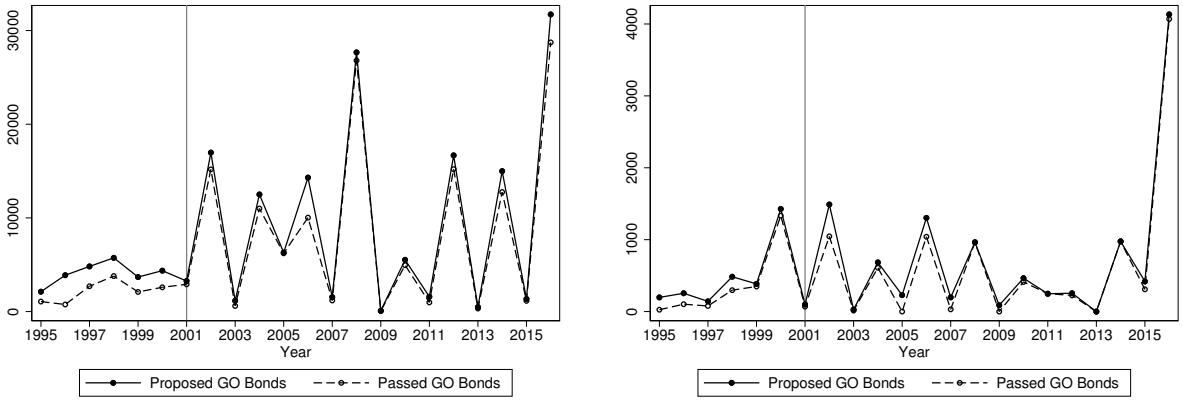
Includes general obligation bonds by K-12 school districts and community colleges. Each line represents the cumulative density function for measures in the stated year.

Figure A2: Number of Proposed and Passed Non-Education GO Bonds, 1995-2016



The graph shows general obligation bonds by counties and municipalities from data described in section 3.

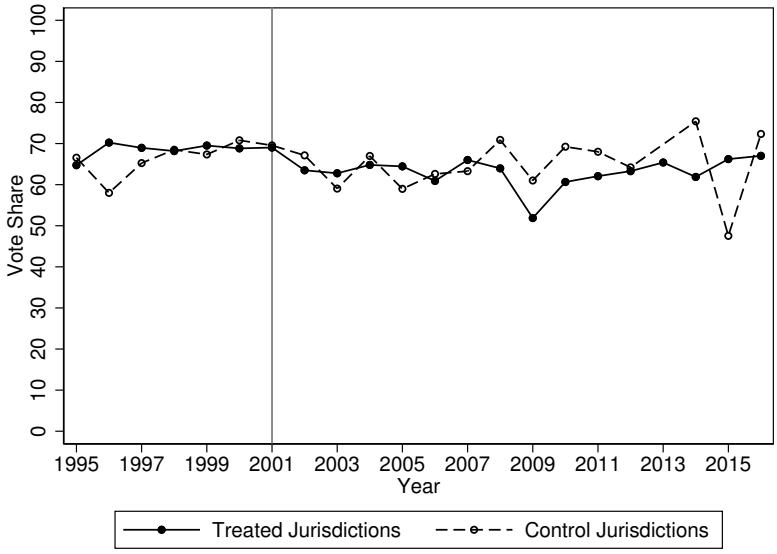
Figure A3: Amount of Proposed and Passed GO Bond Funding, 1995-2016



a) Education Jurisdictions b) Non-Education Jurisdictions

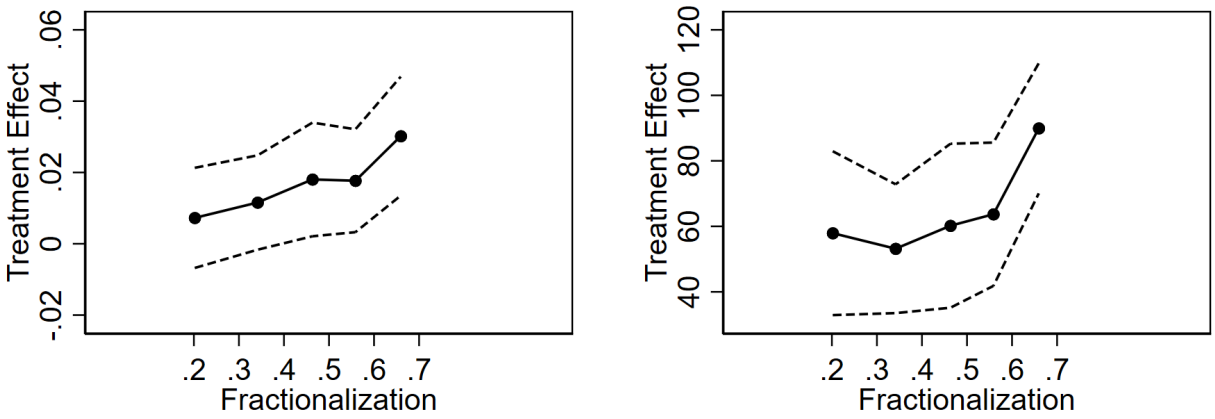
The graph shows general obligation bonds by school, community college, counties and municipalities from data described in section 3.

Figure A4: Vote Share for GO Bonds, 1995-2016



The graph shows the average vote share for general obligation bonds from data described in section 3.

Figure A5: Effect of Proposition 39 on Jurisdiction-Level Outcomes by Quintile of Fractionalization, with County by Year Fixed Effects

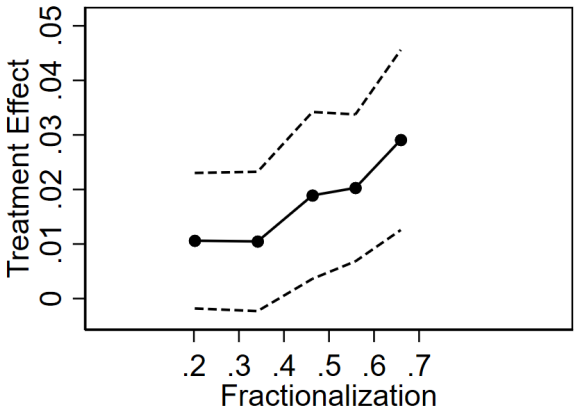


a) Passed bond

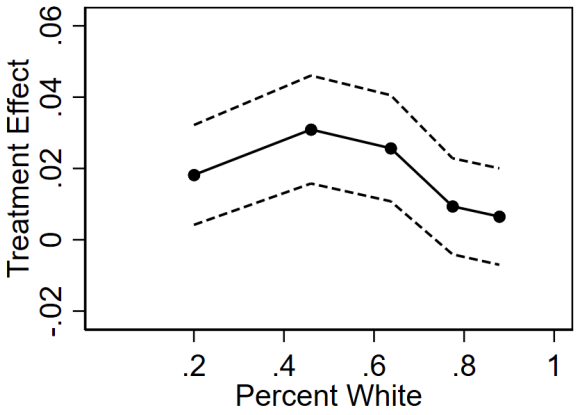
b) Passed $/resident

Note: Estimates of the effect of decreasing the vote share requirement estimated according to Equation 1 but where β is allowed to differ by quintile of the fractionalization of the jurisdiction and including county by year fixed effects. The outcome in panel a) is an indicator for whether the government passed one or more GO bonds that year. The outcome in panel b) is the dollar amount of bonds passed divided by the jurisdiction's population in 2000 (zero when no bond passed). The average values of fractionalization within each quintile are shown on the horizontal axis. Fractionalization is measured in the year 2000. The dashed lines illustrate 95% confidence intervals which allow for clustering at the government level.

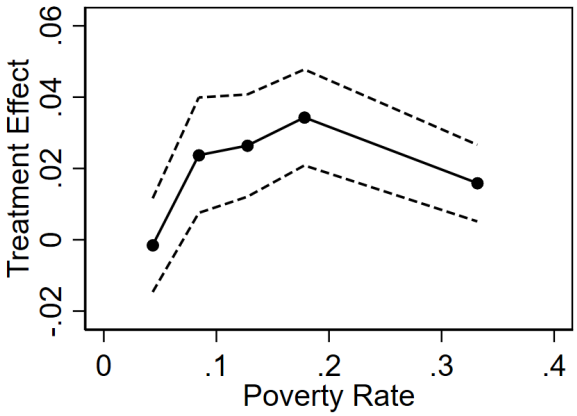
Figure A6: Heterogeneity in Effect of Proposition 39 on Jurisdiction-Level Approval of Any Capital Funding



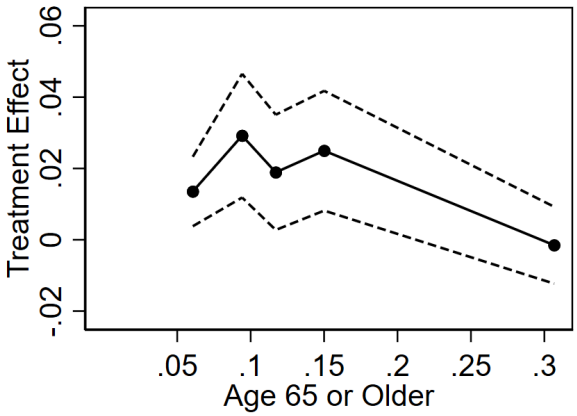
a) Racial Fractionalization



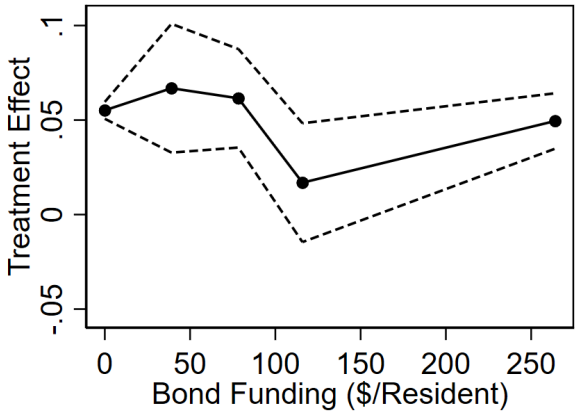
b) Percent White



c)Poverty Rate



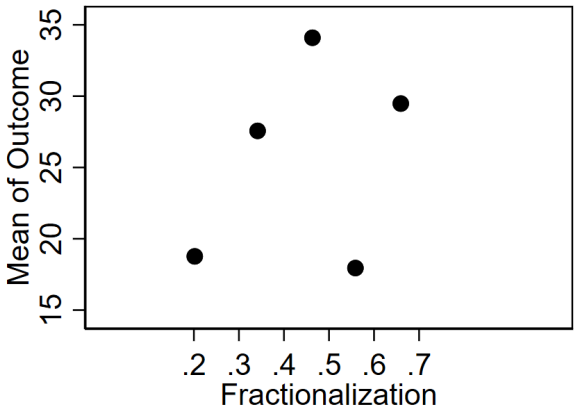
d) Percent Age 65+



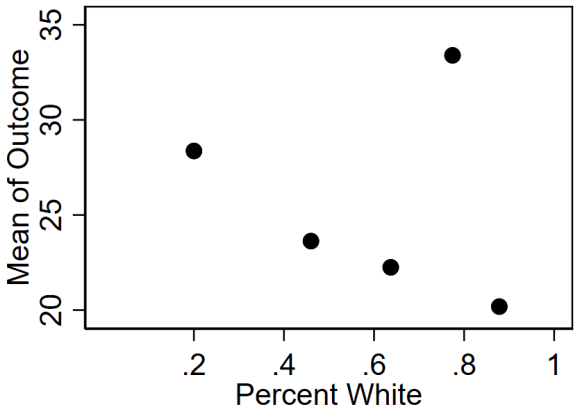
e) Pre-2001 Bond Funding

Note: Estimates of the effect of decreasing the vote share requirement on whether a bond passed, estimated according to Equation 1 but where β is allowed to differ by the characteristic corresponding to that panel. In panels a) through d) β is allowed to differ by quintiles of the characteristic (measured in 2000) while in panel e) it is allowed to differ by quartile of 1995-2001 bond funding, if positive, or zero bond funding. The average values of the characteristic within each group are shown on the horizontal axes. The dashed lines illustrate 95% confidence intervals which allow for clustering at the government level.

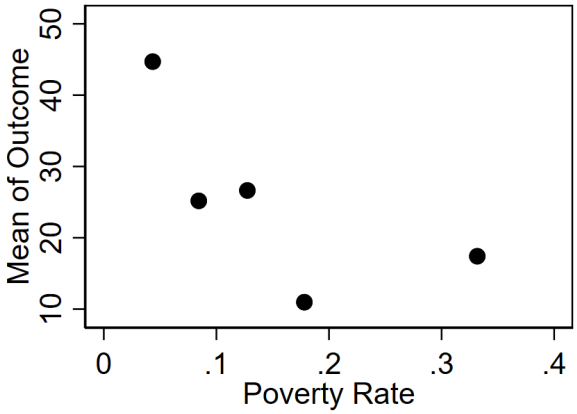
Figure A7: Pre-2001 Approved Capital Funding Per Resident by Quintile of Jurisdiction Characteristics



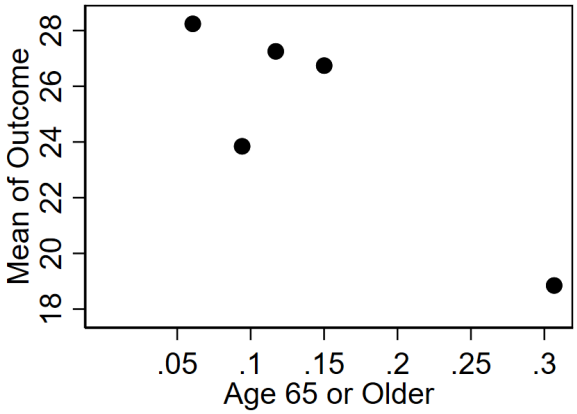
a) Racial Fractionalization



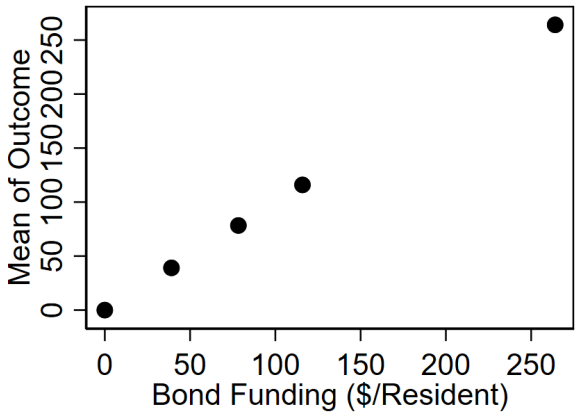
b) Percent White



c)Poverty Rate



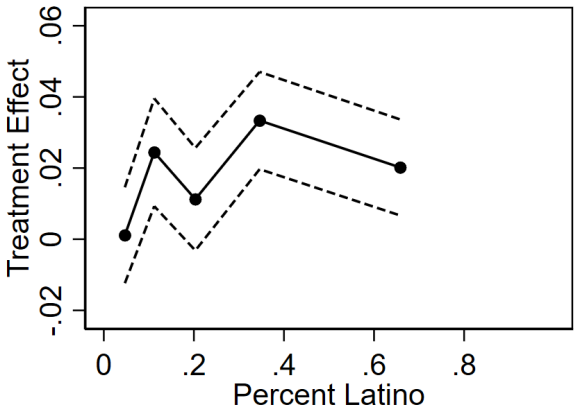
d) Percent Age 65+



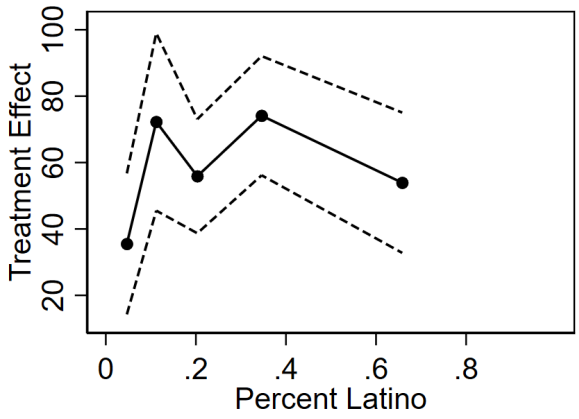
e) Pre-2001 Bond Funding

Note: Panels a) through d) show average bond funding per resident prior to the policy change by quintile of the jurisdiction characteristic corresponding to that panel. Panel e) shows average bond funding per resident prior to the policy change by quartile of pre-2001 bond funding, if positive, or zero bond funding.

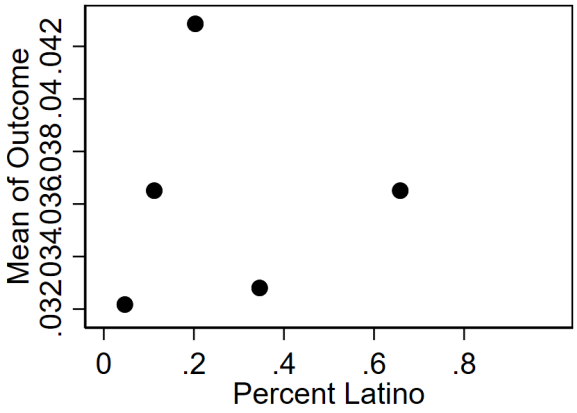
Figure A8: Effect of Proposition 39 on Jurisdiction-Level Outcomes by Quintile of Percent Latino



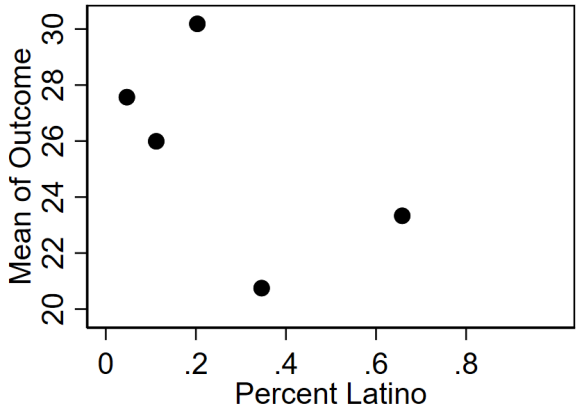
a) Treatment Effects, Passed bond



b) Treatment Effects, Passed $/resident



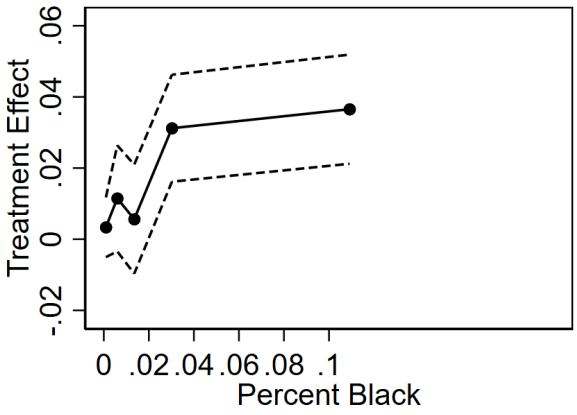
c) Pre-2001 Means, Passed bond



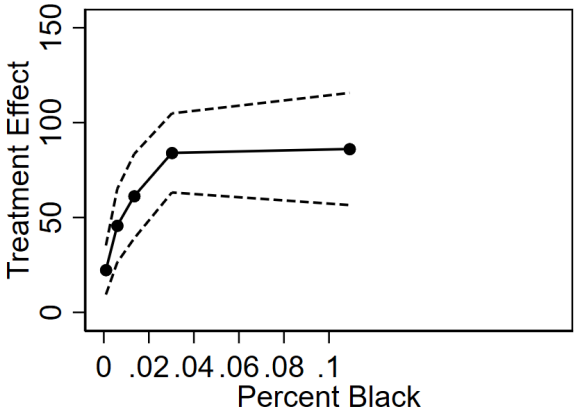
d) Pre-2001 Means, Passed $/resident

Note: Estimates of the effect of decreasing the vote share requirement estimated according to Equation 1 but where β is allowed to differ by quintile of the percent of jurisdiction residents who are Latino. The outcome in panel a) is an indicator for whether the government proposed *and passed* one or more GO bonds that year. The outcome in panel b) is the dollar amount of bonds proposed *and passed* divided by the jurisdiction's population in 2000 (zero when no bond passed). The dashed lines illustrate 95% confidence intervals which allow for clustering at the government level. Panels c) and d) describe the pre-2001 average outcome within each quintile.

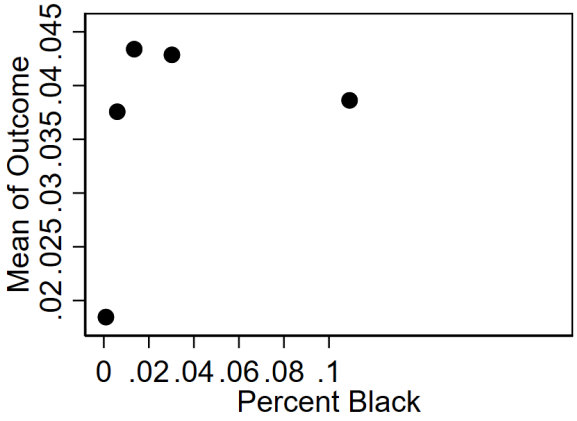
Figure A9: Effect of Proposition 39 on Jurisdiction-Level Outcomes by Quintile of Percent Black



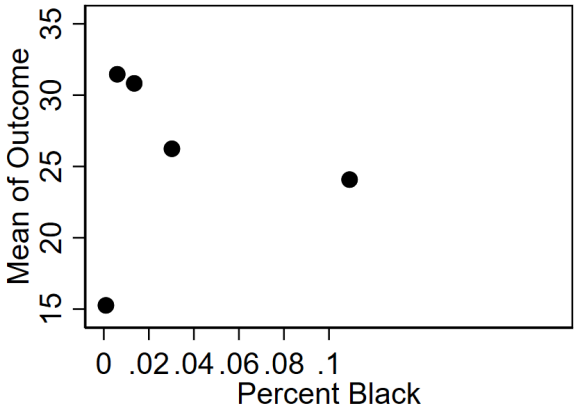
a) Treatment Effects, Passed bond



b) Treatment Effects, Passed $/resident



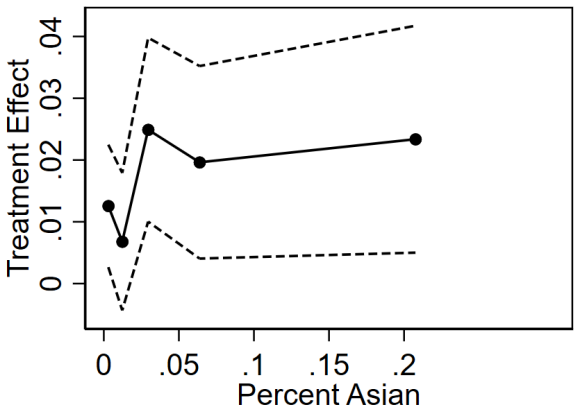
c) Pre-2001 Means, Passed bond



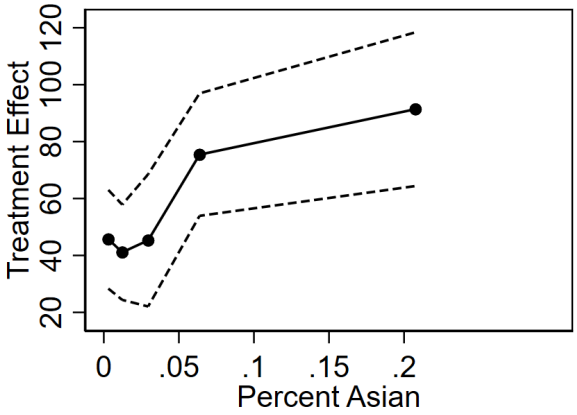
d) Pre-2001 Means, Passed $/resident

Note: Estimates of the effect of decreasing the vote share requirement estimated according to Equation 1 but where β is allowed to differ by quintile of the percent of jurisdiction residents who are Black. The outcome in panel a) is an indicator for whether the government proposed *and passed* one or more GO bonds that year. The outcome in panel b) is the dollar amount of bonds proposed *and passed* divided by the jurisdiction's population in 2000 (zero when no bond passed). The dashed lines illustrate 95% confidence intervals which allow for clustering at the government level. Panels c) and d) describe the pre-2001 average outcome within each quintile.

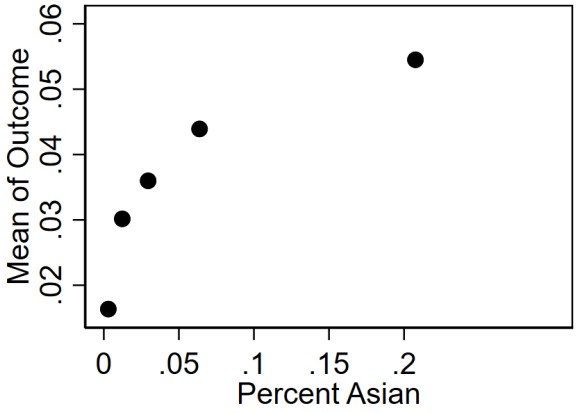
Figure A10: Effect of Proposition 39 on Jurisdiction-Level Outcomes by Quintile of Percent Asian



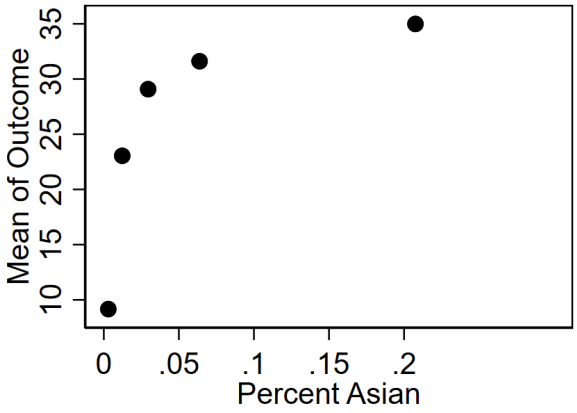
a) Treatment Effects, Passed bond



b) Treatment Effects, Passed $/resident



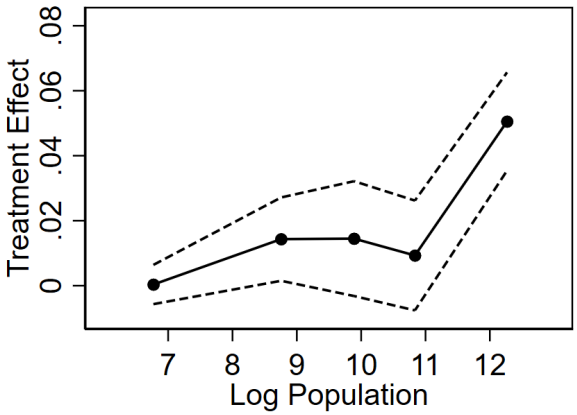
c) Pre-2001 Means, Passed bond



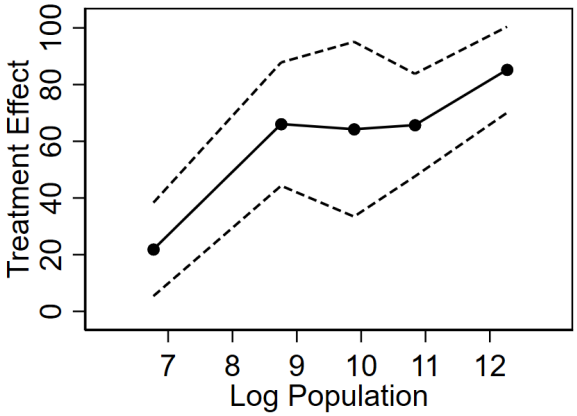
d) Pre-2001 Means, Passed $/resident

Note: Estimates of the effect of decreasing the vote share requirement estimated according to Equation 1 but where β is allowed to differ by quintile of the percent of jurisdiction residents who are Asian. The outcome in panel a) is an indicator for whether the government proposed *and passed* one or more GO bonds that year. The outcome in panel b) is the dollar amount of bonds proposed *and passed* divided by the jurisdiction's population in 2000 (zero when no bond passed). The dashed lines illustrate 95% confidence intervals which allow for clustering at the government level. Panels c) and d) describe the pre-2001 average outcome within each quintile.

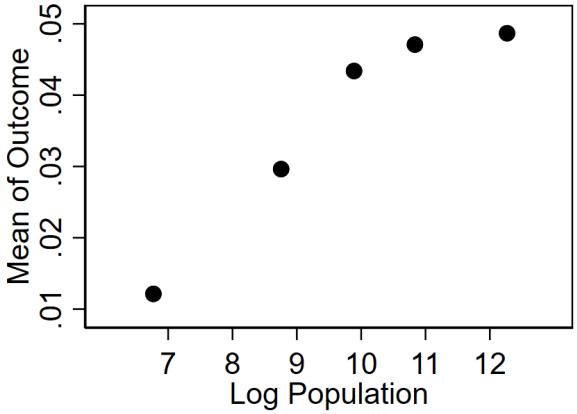
Figure A11: Effect of Proposition 39 on Jurisdiction-Level Outcomes by Quintile of Population



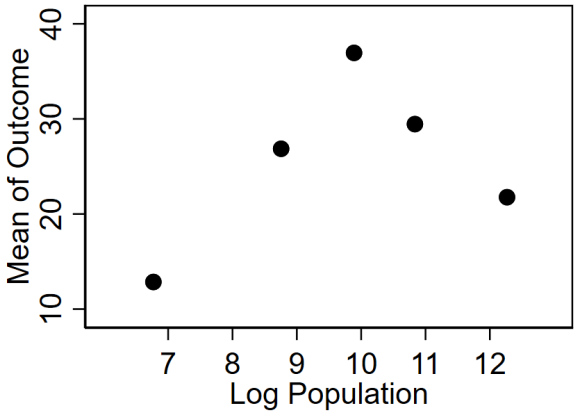
a) Treatment Effects, Passed bond



b) Treatment Effects, Passed $/resident



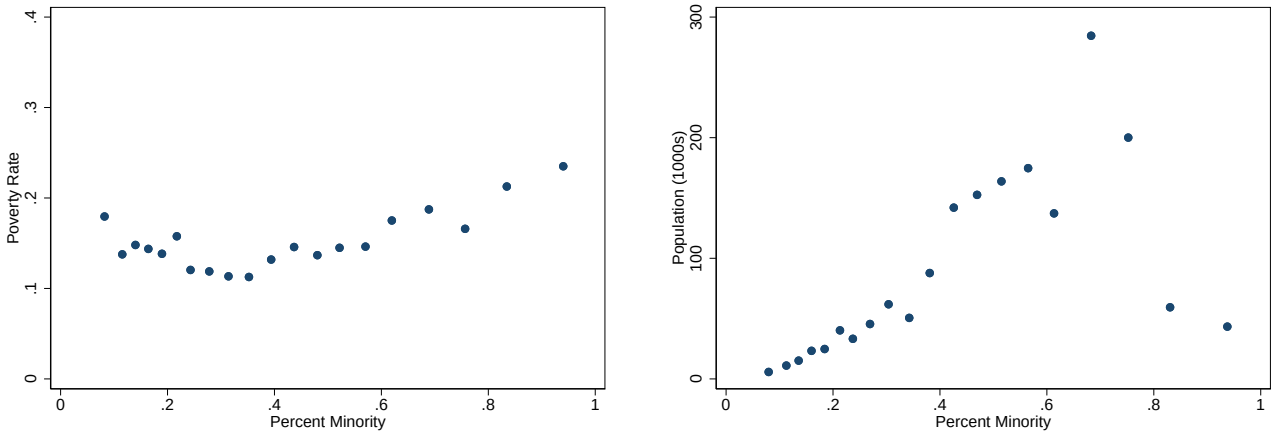
c) Pre-2001 Means, Passed bond



d) Pre-2001 Means, Passed $/resident

Note: Estimates of the effect of decreasing the vote share requirement estimated according to Equation 1 but where β is allowed to differ by quintile of log population. The outcome in panel a) is an indicator for whether the government proposed *and passed* one or more GO bonds that year. The outcome in panel b) is the dollar amount of bonds proposed *and passed* divided by the jurisdiction's population in 2000 (zero when no bond passed). The dashed lines illustrate 95% confidence intervals which allow for clustering at the government level. Panels c) and d) describe the pre-2001 average outcome within each quintile.

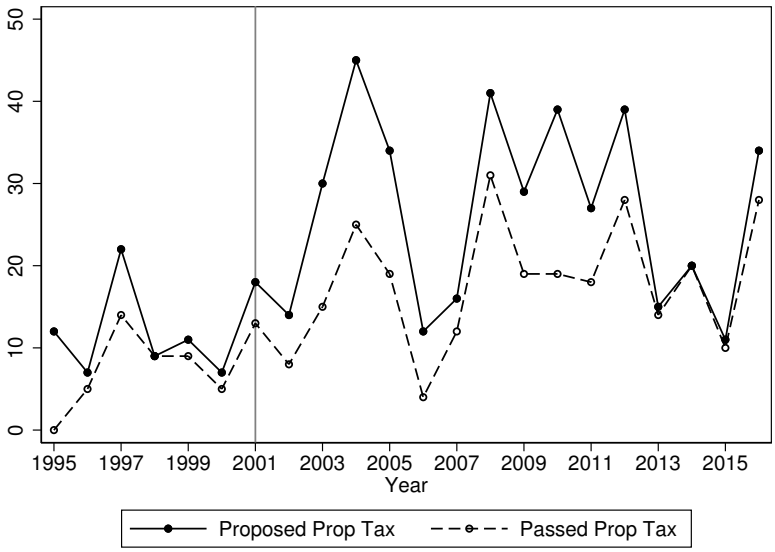
Figure A12: Correlation Between Jurisdiction Non-White Share, Poverty Rate, and Population



a) Poverty Rate b) Population

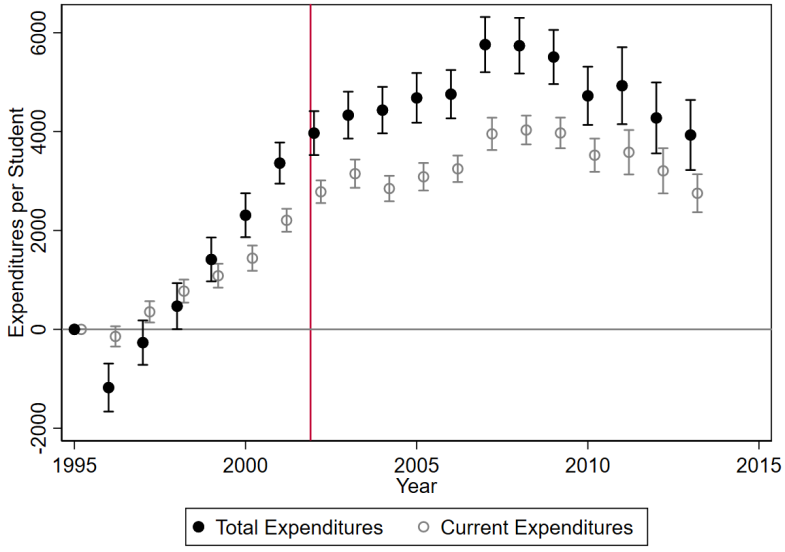
Note: These figures show binned scatterplots of the jurisdiction-level poverty rate in 2000 from the US Census on the vertical axis, and the share of a jurisdiction's population that is non-White on the horizontal axis.

Figure A13: Number of Proposed and Passed Education Taxes, 1995-2016



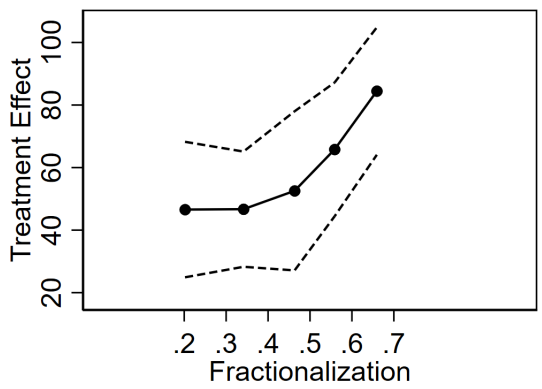
The graph shows taxes passed by K-12 school districts and community colleges from data described in section 3.

Figure A14: Trends in District-Level Per-Student Total and Current Expenditures

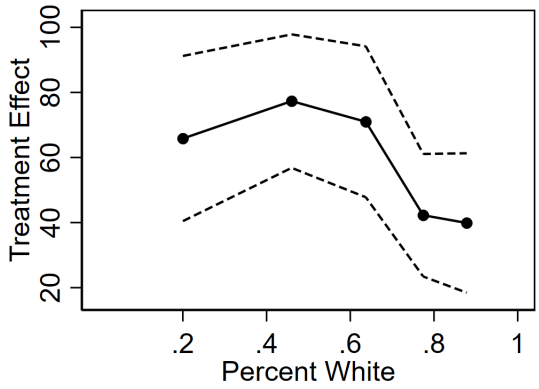


Note: Figure shows coefficients and 95% confidence intervals for regressions of current expenditures and total expenditures on year dummies and district fixed effects. Data come from the Common Core of Data.

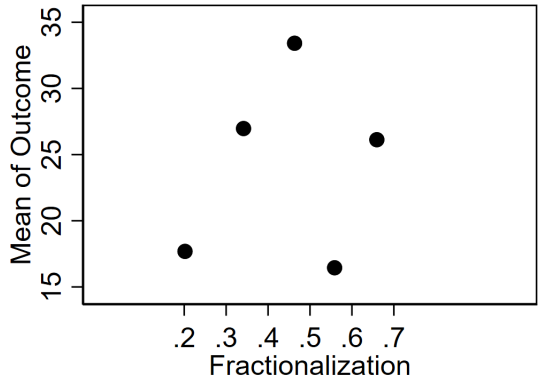
Figure A15: Heterogeneous Effects of Proposition 39 on Dollars Passed Per Resident, Excluding Critically Overcrowded Schools



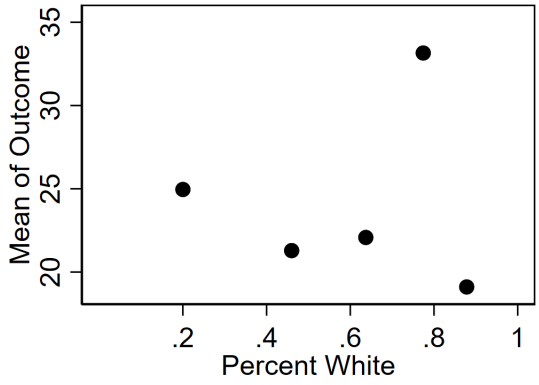
a) Treatment Effects, by Fractionalization



b) Treatment Effects, by Fraction white



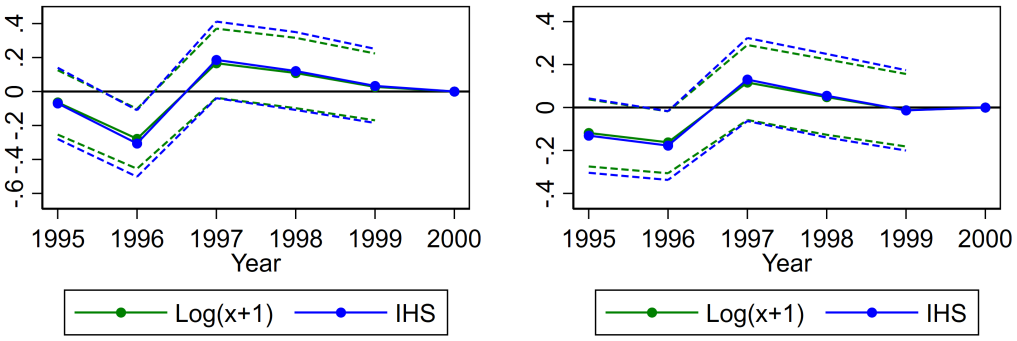
c) Pre-2001 Means, by Fractionalization



d) Pre-2001 Means, by Fraction white

Note: Panels a) and b) display estimates of the effect of decreasing the vote share requirement on the dollar amount of bonds passed divided by the jurisdiction's population in 2000 (zero when no bond passed), estimated according to Equation 1 but where β is allowed to differ by quintile of fractionalization (panel a) or the fraction of residents that are non-Hispanic white. The average values of the characteristic within each group are shown on the horizontal axes. The dashed lines illustrate 95% confidence intervals which allow for clustering at the government level. Panels c) and d) describe the pre-2001 average approved funding within each quintile.

Figure A16: Pre-trend estimates using alternative specifications



a) Proposed $/resident b) Passed $/resident

Note: Estimates of dynamic treatment effect of decreasing the vote share requirement estimated according to Equation 2 but allowing β to differ by year but constrained to zero in 2000 and only for pre-policy periods. The green line displays effects on the log of dollars per resident plus one while the blue lines display estimated effects on the inverse hyperbolic sine of dollars per resident. The dashed lines illustrate 95% confidence intervals which allow for clustering at the government level for their respective estimate.

Table A1: Main Effects, Controlling for Election Timing

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Prop. Bond	Prop. $/Res	Vote Share		Approved		Appr. Bond	Appr. $/Res
post_treat	0.00205	48.42*	-0.0531*	-0.0538*	0.210*	0.206*	0.0170***	57.54***
	(0.00414)	(21.69)	(0.0257)	(0.0253)	(0.0942)	(0.0931)	(0.00317)	(4.814)
Y-Mean	0.0549	82.26	0.653	0.653	0.742	0.742	0.0426	53.22
N	34892	34672	2037	2037	2037	2037	34892	34672
R-sq	0.0978	0.0702	0.0554	0.0925	0.0647	0.0853	0.0835	0.0674
Govt. FE	X	X	X	X	X	X	X	X
Midterm Flag	X	X	X		X		X	X
Presidential Flag	X	X	X		X		X	X
Year FE				X		X		
November Flag				X		X		
Unconditional Sample	X	X					X	X
Conditional Sample			X	X	X	X		

Note: Columns 1,2, 7, and 8 are estimates of the effect of decreasing the vote share requirement estimated according to Equation 1. Each observation represents a government in a particular year. The outcome in column 1 is an indicator for whether the government proposed a GO bond that year. The outcome in column 2 is the dollar amount the government proposed that year divided by the jurisdiction's population in 2000 (zero when no bond is proposed). The outcome in column 7 is an indicator for whether the government passed a GO bond that year. The outcome in column 8 is the dollar amount the government passed that year divided by the jurisdiction's population in 2000 (zero when no bond is proposed). Columns 3 through 6 are estimates of the effect of decreasing the vote share requirement estimated according to Equation 2. Each observation represents a proposed GO bond. The outcome in columns 3 and 4 is the vote share and the outcome in columns 5 and 6 is whether the bond was approved. Standard errors allow for clustering at the government level. Standard errors allow for clustering at the government level. Regressions control for indicators of whether the election was a general or midterm election, or whether the election occurred in November. * $p < .05$ ** $p < .01$ *** $p < .001$

Table A2: Heterogeneity by Fractionalization in Effect of Proposition 39 on Jurisdiction-Level Outcomes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Proposed Bond		Proposed $/Res		Approved Bond		Approved $/Res	
Post x High Fractionalization	-0.00233	0.000455	-0.486	-22.77	0.00317	0.00532	2.806	-2.782
	(0.00410)	(0.00515)	(3.453)	(18.27)	(0.00285)	(0.00378)	(2.180)	(5.006)
Post x Treat x High Fractionalization	0.00698	0.00510	16.03	5.998	0.0157*	0.0160*	27.29**	24.57*
	(0.00829)	(0.00877)	(44.94)	(57.72)	(0.00635)	(0.00678)	(9.555)	(10.55)
Post x Treat	-0.00147	-0.00203	40.72**	61.65**	0.00958*	0.00838	44.66***	52.38***
	(0.00532)	(0.00593)	(14.44)	(22.94)	(0.00428)	(0.00480)	(6.953)	(8.021)
Y-Mean	0.0549	0.0547	82.26	82.27	0.0426	0.0424	53.22	53.23
N	34892	34826	34672	34606	34892	34826	34672	34606
R-sq	0.110	0.147	0.0732	0.122	0.0965	0.134	0.0768	0.112
Govt. FE	X	X	X	X	X	X	X	X
Year FE	X		X		X		X	
Year X County FE		X		X		X		X

Note: Estimates of the effect of decreasing the vote share requirement estimated according to Equation 1 where β is allowed to differ according to whether the jurisdiction is above or below the median of jurisdiction's fractionalization in the year 2000 (0.46). Each observation represents a government in a particular year. The outcome in columns 1 and 2 is an indicator for whether the government proposed a bond that year. The outcomes in columns 3 and 4 is the dollar amounts proposed per resident of the jurisdiction in the year 2000 (zero when no bond is proposed). The outcome in columns 5 and 6 is an indicator for whether the government proposed *and passed* a bond that year. The outcome in columns 7 and 8 is the dollar amount the government proposed *and passed* that year per resident of the jurisdiction in the year 2000 (zero when no bond is passed). Standard errors allow for clustering at the government level. * $p < .05$ ** $p < .01$ *** $p < .001$

Table A3: Effect of Proposition 39 on Jurisdiction-Level and Election-Level Outcomes, Excluding Community Colleges

	(1)	(2)	(3)	(4)	(5)	(6)
	Proposed Bond	Proposed $/Res	Vote Share	Approved	Approved Bond	Approved $/Res
Post x Treat	-0.00372	46.38*	-0.0513*	0.204*	0.0122***	56.87***
	(0.00425)	(23.29)	(0.0254)	(0.0928)	(0.00324)	(5.114)
Y-Mean	0.0530	83.05	0.654	0.738	0.0410	53.25
N	33308	33088	1909	1909	33308	33088
R-sq	0.110	0.0730	0.0843	0.0785	0.0956	0.0756
Govt. FE	X	X			X	X
Year x Govt. FE			X	X		
Unit of Obs.	Juris	Juris	Election	Election	Juris	Juris

Note: Columns 1,2, 5, and 6 are estimates of the effect of decreasing the vote share requirement estimated according to Equation 1. Each observation represents a government in a particular year. The outcomes in columns 1 and 2 are an indicator for whether the government proposed a GO bond that year and the proposed funding per resident, respectively. The outcomes in columns 5 and 6 are whether the government approved a bond that year and the approved funding per resident, respectively. Columns 3 and 4 are estimates of the effect of decreasing the vote share requirement estimated according to Equation 2. Each observation represents a proposed GO bond. The outcomes in columns 3 and 4 are the vote share in favor and whether the measure was approved, respectively. Standard errors allow for clustering at the government level. Sample excludes community college districts. * $p < .05$ ** $p < .01$ *** $p < .001$

Table A4: Effect of Proposition 39 on Jurisdiction-Level and Election-Level Outcomes, Pre-2007

	(1) Proposed Bond	(2) Proposed $/Res	(3) Vote Share	(4) Approved	(5) Approved Bond	(6) Approved $/Res
Post x Treat	0.00323	28.07	-0.0337	0.297*	0.0189***	40.46***
	(0.00577)	(16.87)	(0.0314)	(0.120)	(0.00496)	(6.965)
Y-Mean	0.0578	63.70	0.661	0.679	0.0416	37.76
N	18996	18876	1174	1174	18996	18876
R-sq	0.171	0.107	0.0911	0.0636	0.137	0.129
Govt. FE	X	X			X	X
Year x Govt. FE			X	X		
Unit of Obs.	Juris	Juris	Election	Election	Juris	Juris

Note: Columns 1,2, 5, and 6 are estimates of the effect of decreasing the vote share requirement estimated according to Equation 1. Each observation represents a government in a particular year. The outcomes in columns 1 and 2 are an indicator for whether the government proposed a GO bond that year and the proposed funding per resident, respectively. The outcomes in columns 5 and 6 are whether the government approved a bond that year and the approved funding per resident, respectively. Columns 3 and 4 are estimates of the effect of decreasing the vote share requirement estimated according to Equation 2. Each observation represents a proposed GO bond. The outcomes in columns 3 and 4 are the vote share in favor and whether the measure was approved, respectively. Standard errors allow for clustering at the government level. Sample excludes data after 2007. * $p < .05$ ** $p < .01$ *** $p < .001$

Table A5: Effect of Proposition 39 on Jurisdiction-Level Tax Outcomes

	(1) Proposed Tax	(2) Approved Tax	(3) Proposed Bond or Tax	(4) Approved Bond or Tax
Post x Treat	-0.00677	-0.0279***	-0.00651	-0.00994
	(0.00687)	(0.00494)	(0.00788)	(0.00594)
Y-Mean	0.0572	0.0370	0.112	0.0798
N	34826	34826	34826	34826
R-sq	0.212	0.193	0.185	0.173
Govt. FE	X	X	X	X

Note: Estimates of the effect of decreasing the vote share requirement estimated according to Equation 1. Each observation represents a government in a particular year. The outcome in column 1 is an indicator for whether the government proposed a non-bond tax measure that year and the outcome in column 2 is whether they passed a non-bond tax measure that year. The outcome in column 3 is whether they proposed any type of tax measure (bond or non-bond) that year and 4 is whether they approved such a measure. Standard errors allow for clustering at the government level. * $p < .05$ ** $p < .01$ *** $p < .001$

Table A6: Effect of Proposition 39 on Election-Level Results, Including All Tax Measures

	(1)	(2)	(3)	(4)
	Election Vote Share		Election Approved	
Post x Treat	-0.0916***	-0.0869***	0.0472	0.0566
	(0.0108)	(0.0106)	(0.0373)	(0.0375)
Y-Mean	0.630	0.630	0.672	0.672
N	4479	4479	4479	4479
R-sq	0.0739	0.107	0.0755	0.0844
Year FE	X	X	X	X
Govt Type FE		X		X

Note: Estimates of the effect of decreasing the vote share requirement estimated according to Equation 2. Each observation represents a proposed GO bond or other tax. The outcome in columns 1-2 is the vote share that the bond received. The outcome in columns 3-4 is whether the voters approved the bond Standard errors allow for clustering at the government level. * $p < .05$ ** $p < .01$ *** $p < .001$

Table A7: Main Effects, Weighting by Jurisdiction Population

	(1)	(2)	(3)	(4)	(5)	(6)
	Prop. Bond	Prop. $/Res	Vote Share	Approved	Appr. Bond	Appr. $/Res
Post x Treat	0.0391	70.63***	-0.0641**	0.240	0.0701***	81.47***
	(0.0213)	(8.268)	(0.0199)	(0.168)	(0.0148)	(11.53)
Y-Mean	0.0859	64.02	0.666	0.770	0.0682	53.59
N	34606	34606	1993	1993	34606	34606
R-sq	0.262	0.156	0.207	0.238	0.243	0.170
Govt. FE	X	X	X	X	X	X
Year FE				X		X
Unconditional Sample	X	X			X	X
Conditional Sample			X	X		

Note: Columns 1,2, 5, and 6 are estimates of the effect of decreasing the vote share requirement estimated according to Equation 1. Each observation represents a government in a particular year. The outcomes in columns 1 and 2 are an indicator for whether the government proposed a GO bond that year and the proposed funding per resident, respectively. The outcomes in columns 5 and 6 are whether the government approved a bond that year and the approved funding per resident, respectively. Columns 3 and 4 are estimates of the effect of decreasing the vote share requirement estimated according to Equation 2. Each observation represents a proposed GO bond. The outcomes in columns 3 and 4 are the vote share in favor and whether the measure was approved, respectively. Standard errors allow for clustering at the government level. Regressions are weighted by population. * $p < .05$ ** $p < .01$ *** $p < .001$

Table A8: Main Effects, Excluding Critically Overcrowded Schools

	(1)	(2)	(3)	(4)	(5)	(6)
	Prop. Bond	Prop. $/Res	Vote Share	Approved	Appr. Bond	Appr. $/Res
Post x Treat	0.00292	65.50***	-0.0504	0.443*	0.0186***	65.48***
	(0.00468)	(18.46)	(0.0342)	(0.177)	(0.00366)	(5.644)
Y-Mean	0.0523	80.26	0.648	0.706	0.0404	51.22
N	33792	33572	252	252	33792	33572
R-sq	0.146	0.122	0.177	0.183	0.133	0.111
Govt. FE	X	X	X	X	X	X
Year FE				X		X
Unconditional Sample	X	X			X	X
Conditional Sample			X	X		

Note: Columns 1,2, 5, and 6 are estimates of the effect of decreasing the vote share requirement estimated according to Equation 1. Each observation represents a government in a particular year. The outcomes in columns 1 and 2 are an indicator for whether the government proposed a GO bond that year and the proposed funding per resident, respectively. The outcomes in columns 5 and 6 are whether the government approved a bond that year and the approved funding per resident, respectively. Columns 3 and 4 are estimates of the effect of decreasing the vote share requirement estimated according to Equation 2. Each observation represents a proposed GO bond. The outcomes in columns 3 and 4 are the vote share in favor and whether the measure was approved, respectively. Standard errors allow for clustering at the government level. Sample excludes districts with one or more schools eligible for the critically overcrowded schools program. * $p < .05$ ** $p < .01$ *** $p < .001$

Table A9: Heterogeneity in Effect of Proposition 39 on Jurisdiction-Level Outcomes, Excluding Critically Overcrowded Schools

	(1)	(2)	(3)	(4)
	High vs Low Minority		High vs Low Fractionalization	
	Proposed $/Res	Approved $/Res	Proposed $/Res	Approved $/Res
Post x High Minority	10.68	-5.863		
	(26.30)	(6.026)		
Post x Treat x High Minority	-2.188	19.52		
	(51.33)	(11.42)		
Post x Treat	67.10**	55.39***	62.65**	52.00***
	(21.74)	(7.517)	(23.83)	(8.209)
Post x High Fractionalization			-22.85	-3.176
			(18.46)	(5.063)
Post x Treat x High Fractionalization			5.558	25.41*
			(60.85)	(10.86)
Y-Mean	80.26	51.22	80.26	51.22
N	33572	33572	33572	33572
R-sq	0.122	0.112	0.122	0.112
Govt. FE	X	X	X	X
Year X County FE	X	X	X	X

Note: Estimates of the effect of decreasing the vote share requirement estimated according to Equation 1, where the outcome is the proposed or approved dollar amount per resident and where β is allowed to differ according to the characteristics of the jurisdiction. "High minority" is defined as being below the median jurisdiction-level fraction of non-Hispanic whites in 2000. High fractionalization is defined as above the median fractionalization index in 2000. Each observation represents a government in a particular year. Standard errors allow for clustering at the government level. Sample excludes districts with one or more schools eligible for the critically overcrowded schools program. * $p < .05$ ** $p < .01$ *** $p < .001$

A2 Conceptual Model

This section provides full details to the model described in Section 3. The model primitives are described there.

We assume a probabilistic voting model in which there are shocks to voters' preferences for the proposal. This allows the model to rationalize failed referenda which without some uncertainty on the votes' outcome would not occur. Specifically, there are two mean zero shocks, one common to all voters and one idiosyncratic. When choosing what proposal to make, the politician knows how the shocks are distributed but does not know their realizations. Since they are uncertain whether any proposal they make would pass, they will choose their proposal so as to maximize their expected utility over the possible outcomes.

Given this structure of uncertainty,voter i will vote in favor of a proposal g' if

$$-(g'-\theta)^2 \geq -(g-\theta)^2 + \sigma_i + \delta$$

where σ_i is an idiosyncratic preference shock representing voter i's bias in favor of the reversion level and δ is a preference shock in favor of the reversion level that is experienced by all voters.[18] σ and δ are both uniformly distributed random variables; the former over the range $[-\phi, \phi]$ and the latter over the range $[-\psi, \psi]$. Thus, all voters with $\sigma_i \leq -(g'-\theta)^2 + (g-\theta)^2 - \delta$ will vote for the proposal. Under the distributional assumptions on σ_i and δ, the fraction of voters who will vote yes and the probability that the proposal prevails both have simple solutions.

The fraction of voters who will approve a proposal is given by

$$\pi(g') = P\Big[\sigma_i \leq (g-\theta)^2 - (g'-\theta)^2 - \delta\Big] = \frac{\phi - (g'-\theta)^2 + (g-\theta)^2 - \delta}{2\phi}. \tag{4}$$

For a proposal g' to prevail, this fraction must exceed v. The probability that this occurs is

$$P[\frac{\phi - (g'-\theta)^2 + (g-\theta)^2 - \delta}{2\phi} \geq v] \tag{5}$$

which yields, the probability of a proposal passing:

$$p(g';v) = \begin{cases} 1 & \text{if } g' \leq \theta + \sqrt{(g-\theta)^2 - \phi(2v-1) - \psi} \\ \frac{(g-\theta)^2 - (g'-\theta)^2 - \phi(2v-1) + \psi}{2\psi} & \text{if } \theta + \sqrt{(g-\theta)^2 - \phi(2v-1) + \psi} < g' < \theta + \sqrt{(g-\theta)^2 - \phi(2v-1) - \psi} \\ 0 & \text{if } g' \geq \theta + \sqrt{(g-\theta)^2 - \phi(2v-1) + \psi} \end{cases} \tag{6}$$

In the case that it is strictly between zero and one, this probability is increasing in the voter's preference for it, relative to the reversion outcome and decreasing in the vote share v required to win. As the variance of the voting shocks ϕ and ψ increase, it matters less what the proposal is, since more of the outcome is random. [19]

[18] These preference shocks add uncertainty to the voting outcome in a tractable way. See (Persson and Tabellini, 2000) for a discussion of this method.

[19] Specifically, if aggregate uncertainty is very large, all proposals will have a 50% chance of passing, while if idiosyncratic uncertainty is high all proposals are expected to get approximately 50% of the vote. We assume that given the relevant vote share requirements for our analysis, the idiosyncratic uncertainty is small enough relative to aggregate uncertainty that there is always some proposal that would have a positive chance of success. This requires $\psi/\phi \geq 2v-1$.

When choosing what proposal to make, the politician knows how the shocks are distributed but does not know their realizations. Since they are uncertain whether any proposal they make would pass, they will choose their proposal so as to maximize their expected utility over the possible outcomes. Thus, they will choose the proposal that solves

$$\max_{g'} -p(g';v)(g'-\theta-b)^2-(1-p(g';v))(g-\theta-b)^2.$$

The politician's preferred proposal must then satisfy the first order condition

$$(g'-\theta)\Big[(g'-\theta-b)^2-(g-\theta-b)^2\Big]-2\psi p(g';v)(g'-\theta-b)=0. \tag{7}$$

If there is no disagreement between the voters and the politician, and thus b is zero, it is always optimal for the politician to propose the voter's (and hence their own) preferred level. Setting the proposal at their shared optimum means that both $g'-\theta=0$ and $g'-\theta-b$ and Equation 7 is satisfied. This is true regardless of the vote threshold, v, or level of uncertainty. When there is disagreement (i.e., $b>0$), the distance between the status quo level of funding and the voter's preferred level determines the magnitude of the politician's agenda-setting power. When this is large, the politician will propose a level closer to their own ideal level.

However, the politician will only propose exactly their ideal level when the probability of it passing is one. We focus on situations where this is not true. In that case, the optimal proposal g' will always exceed θ and be less than $\theta+b$. To see this, note that for any proposal less than θ, a small increase in its size increases both the chance that it would prevail and the politician's payoff if it did. Proposing the voter's optimum will also not be optimal because a small increase in the proposal will have a larger effect on the politician's payoff than it will on the probability it passes. Similarly, the politician would never choose to propose something larger than their ideal level. Further, proposing their own ideal level will never be optimal because a small decrease in the proposal would have only an infinitesimal effect on the politician's possible payoff and a relatively large effect on the probability their proposal prevails.

In the paper we describe the effect of a change in the required vote share on the proposals, the vote share they receive, the probability of passage, and their combination, the expected level of investment. The former is given by

$$\frac{dg'}{dv}=\frac{\phi(g'-\theta-b)(g'-\theta)}{\psi bp(g';v)-2(g'-\theta)^2(g'-\theta-b)} \tag{8}$$

When there is no disagreement, a change in the threshold does not affect the proposal because they are already proposing their shared optimum and the numerator in Equation 8 is zero. When there is disagreement, this expression is negative and so an increase in the vote share requirement will decrease the size of proposals. To see this note that since g' exceeds θ and is less than $\theta+b$, the numerator must be negative. Due to these facts and that the probability of passage must be positive, the denominator must be positive. Since the vote share requirement only affects the expected vote share through its effect on the proposal, an increase in the requirement will increase the expected vote share. A small change in the threshold's effect on the probability that the proposal prevails is given by

$$\frac{dp(g')}{dv}=\frac{-\phi}{\psi}\left[\frac{(g'-\theta)^2(g'-\theta-b)}{\psi bp(g';v)-2(g'-\theta)^2(g'-\theta-b)}+1\right]. \tag{9}$$

This expression is negative, so a small decrease in the threshold will increase the probability of passage even if there is no disagreement. With disagreement, a small decrease in v will increase

the level of the proposal, g', and increase the probability of the proposal passing. In effect, the politician will use some of their new flexibility on a better proposal and some on an increased likelihood of it prevailing.

In the context of school facilities spending, we do not observe g and g'. Instead, we observe a proposed investment in the pre-existing stock of school facilities. This proposal is equivalent to $g' - g$. If the proposal fails, the reversion level is g, the depreciated existing capital stock. The expected level of school facility investment is then $p(g';v)(g' - g)$. The effect of an increase in vote requirements on this quantity is equal to $\frac{dp(g')}{dv}(g' - g) + p(g';v)\frac{dg'}{dv}$. From equations 8 and 9 we know this is negative. Therefore, a decrease in the vote share as we study in this context, will increase investment even if there is no disagreement between voters and elected officials in the optimal level of funding.

What then determines the magnitude of these effects? The effect of a change in v on both the size of the proposal and its likelihood of passing depends on the level of disagreement, b, as well as the level of uncertainty in the outcome of the election, governed by ψ and ϕ. The magnitude of the effects on both the proposal and the probability of passage are increasing in both b and ϕ, suggesting that larger levels of disagreement between voters and bureaucrats, and greater uncertainty in election outcomes, will result in greater sensitivity to v.[20]

[20] However, the indirect effect of the larger bias and uncertainty on proposals means that it is possible for there to be situations in which these results are reversed. Simulations show that these situations are likely uncommon.