Relaxing Electoral Constraints in Local Education Funding

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February 2020

Abstract

State policies that require local governments to seek voter approval for local budgets and taxes are generally thought to reduce spending. This paper studies the effect of relaxing this constraint on the level of funding that officials propose and that prevails following the necessary referendum. We leverage a policy change in California that lowered the share of votes required to pass a school capital improvement bond by eleven percentage points. We show that this resulted in larger tax proposals which received less support from voters, but resulted in higher levels of approved spending. We show that this effect is concentrated in more racially diverse jurisdictions, suggesting that electoral constraints on local taxes result in larger funding changes in these areas. We use an agenda-setter model of the interaction between 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 often have the option to directly deny the tax increases their elected officials propose, through ballot propositions, initiative, and referendums. In fact, all but three states have a limit on either the taxing or spending abilities of local government (Mullins, 2010). As a result, local governments in the United States often have limited powers over their own budget. Most commonly, state laws require increases in local taxes be put to a public vote before they can be enacted. The general form of these policies is that if a government wants to exceed its unilateral powers it may make a proposal to the voters that stipulates its desired taxes or spending. If voters approve the proposal, it is enacted; otherwise, the government is constrained to a reversion level of taxes or spending.[1]

In general, the need to put budgeting questions to a vote has been shown to reduce the level of spending (Funk and Gathmann, 2011; Feld and Matsusaka, 2003). However, the rules that govern these polices vary in myriad ways and little is known about how those variations affect outcomes. States differ in what types of taxes or spending the rules cover. Some cover only capital spending, while others cover all spending including current expenditures. States also often limit the total amount of tax revenue or the tax rate. Another key difference across states is whether state laws adjust proposals for inflation, changes in population, or growth in the property tax base. States also differ in when they allow governments to put proposals on the ballot. Since voter composition differs by election timing, with higher voter turnout in general elections, governments may use this flexibility strategically (Anzia, 2011; Kogan, Lavertu and Peskowitz, 2018; Meredith, 2009). Finally, states also differ in whether they require a supermajority or simple majority of voters to approve the proposals. All these different state policy variations likely change the overall composition and success of local funding proposals policies. Since they also likely affect different governments differently, changes in these rules may have important consequences for the overall distribution of government resources and publicly provided goods. Yet, little is known about the effects of these policy characteristics on the resulting outcomes.

In this paper, we study a shock to the political process through which certain public good levels

[1] One common area in which these limits apply is in capital financing. In this case, governments often ask voters to approve investments in the level of a depreciating capital stock. If the voters deny the request, the 'reversion' level is the depreciated level of the stock.

are determined in California. The California constitution allows local governments to issue debt to fund capital investments only after a vote of the residents. Prior to 2001, all types of governments required a referendum to achieve at least 66% of votes in favor in order to prevail. In 2000, voters approved Proposition 39, which lowered this vote share requirement to 55%, but only for school districts and community college districts. Using a difference-in-difference design around this policy change and over 4,000 local elections, we estimate the effects of this change on the proposals made by affected districts and their outcomes at the ballot box.

We have three main research questions. First, we examine whether the policy change affected the behavior of school boards and community college districts, changing their likelihood of using bonds, or changing the amount of funding they requested. We find that the policy change made 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 substantially larger bond proposals may result in lower vote shares. So, our second research question asks whether the performance of the proposed bonds changed as a result of the policy. School boards and community college districts may increase the amount of funding they ask for, knowing that larger bonds may still be approved despite 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% dictated by Proposition 39. 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.

This leads to the third research question, which studies the overall effect of the policy change on funding outcomes. Ultimately, the funding provided by the bonds is a function of the size of the proposal as well as its ability to be passed. We find that the overall effect of Proposition 39, combining larger bond proposals and higher passage rates, was $57 per resident in additional dollars of bonds approved by local governments, a more than 100% increase. We show that this effect is larger in jurisdictions with above the median level of minority residents.

In order to understand these results from a theoretical perspective, we develop a simple conceptual model of the interaction between a school board and a representative voter. The model builds 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, if it desires to. However, uncertainty in how residents will vote hinders exercising this power. The passage rate of tax proposals therefore depends upon the level of uncertainty and the degree to which school boards are risk averse. We use this model to show how a change in the required vote share affects the size of the proposals and and the vote outcomes, and show how this depends on the divergence in preferences between voters and elected officials.

Our paper makes several contributions to the literature. First, we contribute to empirical evidence on the fiscal and policy effects of tax limits. Papers in this literature generally find that constraints to local governments finances change the quality of public services (Figlio and Rueben, 2001).[2] These papers tend to study the effect of the existence of local tax limits. However, this paper studies a particular characteristic of the limit itself.

Second, we provide empirical evidence to support predictions from the theoretical literature on local governments as budget maximizers. That is, local governments are understood as trying to grow the size of their budgets. While there is a large literature testing whether the budget maximizing model fits data better than a median-voter model, this is the first paper to do so using plausibly exogenous variation from a policy change.

Third, 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 recent work looking at state governments in the United States has found more mixed results Boustan et al. (2013). Closely related to our work is Rugh and Trounstine (2011) who show 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

[2]See Poterba and Rueben (1995); Dye and McGuire (1997) and the survey by Rose (2010)

policy change we study.

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

2 Background

2.1 Local government funding

In general, school districts can raise additional revenues through issuing bonds or by setting property taxes, usually with the need of voter approval. School finance laws vary by state, so we focus on the ones relevant to California, the state in our study. The two primary tools at the disposal of California school districts are general obligation (GO) bonds and parcel taxes. GO bonds are backed by the full faith and credit of the district, and are repaid with property taxes over many years, typically several decades. They require voter approval and are intended for the repair, construction and replacement of school buildings. The school district issues bonds and pays for them by increasing property taxes. On the other hand, school districts can also raise funds through parcel taxes, which are a flat tax on each real estate parcel. These are different than property taxes, which are a tax on the value of the parcels, and were no longer accessible to districts after the passage of Proposition 13 in 1978. Parcel taxes finance school programs and services. In California school districts primarily rely on GO bonds rather than parcel taxes, perhaps because parcel taxes are less lucrative than GO bonds (Brunner, 2001). This is in contrast to other states, where the use of property taxes is more prevalent.[3]

The state government also contributes to school facility investments. State funds typically come from general obligation bonds issued by the state that required a statewide vote. At the time of the vote on Proposition 39, for K-12 districts, the state typically paid for 50% of new school facilities and 80% of the cost of modernizing existing facilities and the local district would pay the remaining amount out of bonds passed via referendum. In some "hardship cases" the state would pay the entire cost of new facilities or modernization.

[3]A third source of revenue is a revenue bond, which in California is called a Mello-Roos bond. These are bonds meant for specific projects, and were rarely used at all by school districts in the time period we study.

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, whose borders do not necessarily overlap with those of nearby counties or cities, have the ability to fund their capital investments through the same restrictions as school districts, governed by Proposition 13 and other legislation. 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.

Cities, both large and small, often rely on their own revenues for funding. Unlike school districts in California, cities have more tools at their disposal (Rueben, 2003). These include bonds and parcel taxes, as well as sales taxes and business taxes. For this reason, cities are more likely to propose taxes relative to bonds compared to school districts.

Local services in California are also provided by numerous counties and "special districts." Special districts are local jurisdictions that provide a particular service, such as airports, parks, water, and transit. Counties and special districts can also propose GO bonds and various types of taxes. GO bonds in particular are popular with these entities.[4]

2.2 Proposition 39

In California, a series of court decisions and the passage of Proposition 13 in 1978 drastically limited the ability of school districts to fund education using local resources, placing greater responsibility on the state government. 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 propose a bond and put it on the ballot in a referendum where it required a two-thirds majority to prevail.

In 2000, California voters considered two consecutive propositions which would have altered this vote threshold. 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,

[4]For more information on the scope of local finance in California across different types of jurisdictions, see Rueben (2003).

in November 2000 voters approved Proposition 39, which lowered the threshold needed to pass a general obligation bond to 55 percent for kindergarten through twelfth grade districts and community college districts.[5] The legislature passed accompanying legislation that would take effect only if the proposition was approved that placed additional requirements on school bonds to qualify for the 55 percent level. Most notably, it restricted the types of elections in which the bond referendum could appear. The referendum could not occur in a special election but rather must be part of a statewide election or regularly scheduled local 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] Following the passage of the proposal, the new voting threshold and rules went into effect in 2001.[7]

Figure 1 shows the number of education related local general obligation bonds proposed and passed under these provisions each year. It seems nearly self-evident that something changed in 2001 when the change took place. The number of proposed and passed bonds increases and they are far more concentrated in even years than odd years. This is consistent with the accompanying legislation restricting when the referendum could occur. Most statewide elections and regularly scheduled local elections occur in even years. Prior to the policy change, bonds were approximately equally likely to appear in even and odd years.

Figure 2 shows the distribution of the vote shares in favor of proposed education bonds separately before and after the change in vote requirement. 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.

[5] In a series of papers 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 proposal 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

3 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 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, although many estimates are limited to only general obligation bonds.[8]

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. Over the time 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 were for GO bonds.

We complemented 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.[9]

In sum, we create two analysis datasets. The first is a "jurisdiction-level" panel dataset. This

[8] 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.

[9] 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 if there are large differences in population density within a tract.

panel consists of 1,589 jurisdiction-year observations from 1995 to 2016, comprising 977 K-12 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 include GO bonds as well as the nine other types of measures.

Table 1 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 property 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.

4 Empirical Approach

In this section, we describe our strategy to empirically investigate the effect of the change in vote requirements on the behavior of local governments, voters, and the resulting levels of capital education spending. We examine two types of effects. First, how did Proposition 39 change the behavior of affected jurisdictions relative to unaffected jurisdictions, and second, how did Proposition 39 change the content and performance of education-related general obligation bonds relative to other proposals. We use a difference-in-differences strategy to identify both types of effects. However they require two different types of datasets. We first describe the unconditional approach to answer the first set of questions and then the approach conditional on proposing a bond, which we use to answer the second set of questions.

4.1 Estimating effects on government behavior and 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

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

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. 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 these shocks are driven by the demand for public services that are shared by all government types, like those driven by population growth, this would be a reasonable assumption.

We consider this as an unconditional analysis because the equation 1 specification 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 governments from 1995 to 2016.

4.2 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

$$Y_{imt} = \alpha + \beta(education_m * post_t) + \nu_t + \gamma_i + \varepsilon_{mt} \quad (2)$$

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. This analysis cannot be interpreted 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, understanding that they may have changed.

4.3 Outcomes

We use these frameworks to consider the effect of the policy change on various outcomes Y. First, using the unconditional analysis we analyze whether Proposition 39 caused affected jurisdictions to hold more elections or propose additional bonds.

Second, we examine the value of the proposed bonds. In the unconditional analysis using the jurisdiction panel we frame Y_{it} as the total amount of funding through bonds that the jurisdiction proposed, per capita. Jurisdictions that did not propose any bonds that year receive a value of zero. In the conditional analysis using the election dataset Y_{mt} becomes the per-capita funding of each bond.

Third, we examine the vote shares received by various elections. The required vote share for affected elections declined from two thirds to 55%, or a decline of 11.7 percentage points. We can only conduct an analysis of vote shares using the election dataset. However, we can also observe pass rates using both conditional and unconditional analyses.

Finally, we can also observe the resulting funding amount, in the unconditional and conditional

cases. We observe the changes in the proposed amount as well as the changes in the pass rates, but the most policy relevant variable is the resulting amount of education funding from Proposition 39.

5 Results

We organize the results according to the three main research questions. First, did Proposition 39 change the behavior of school boards and community college districts in terms of their likelihood of proposing a GO bond, and the size of the proposal? Second, how did the performance of GO bonds from educational jurisdictions change? Third, what were the effects of Proposition 39 on funding outcomes?

5.1 Government Behavior

We first present results on the proposals made by jurisdictions. Table 2 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 an indicator variable for being a treated type of government, while column 2 replaces that indicator variable with a full vector of government-level fixed effects. In both columns, the estimate is small and not statistically significant.

Panel a) of Figure 3, however, shows 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 votes on GO bonds subject to the lower vote threshold could not be held in special elections. Since regularly scheduled elections are typically in even years this is likely the reason for the jagged shape of the figure, as affected school and community college boards switch the timing of their GO bond proposals in order to qualify for the lower threshold.

Columns 3 and 4 of Table 2 shows the effect of Proposition 39 on the amount of GO bond funding

proposed by jurisdictions. Like with the previous outcome, column 4 contains full government-level fixed effects while column 3 only includes an indicator that the government is a K-12 or community college district. 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 3 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 policy change has 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.

5.2 Election Outcomes

In this section, 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, as well as elections that were not GO bonds. The reported estimates of β 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 3 show a decline in vote share, of between 7 and 8 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 other features of the proposal that we do not measure which may also change—are not sufficient to drive the vote share down by the full amount of the policy change.

The third column limits the sample to just GO bonds, which reduces the number of elections considerably, and increases the standard error. This analysis compares the performance of GO bonds at education-related districts to GO bonds at other districts. For this approach we cannot include government fixed effects or year-by-county fixed effects since many of the jurisdictions only proposed one GO bond throughout the time period. Nevertheless, the coefficient suggests that GO bonds for educational purposes had vote share declines of 5 percentage points relative to GO bonds for other purposes, and we can again rule out a drop of 11.7 percent.

Panel A of Figure 4 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. Towards the end of the sample period, the estimated effect on the vote shares approaches the 11.7 percentage point decline in the vote requirement.

The next three columns of Table 3 show the effect of Proposition 39 on the likelihood that a GO bond would pass. We find no effects that an education GO bond would pass relative to taxes and to GO bonds in other jurisdictions. However, limiting the sample to just GO bonds, we do find that education GO bonds had a 21 percentage point increase in passage rate compared to GO bonds for other purposes. Panel B of Figure 4 shows the analogous year-by-year effect of the policy change.

5.3 Funding Outcomes

The final set of results shows the effects of Proposition 39 on outcomes. Did the change in vote share required to pass an education-related GO bond affect education funding? The previous findings suggest that overall funding should have increased, since we found that bond size increased, as did passage rates.

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 4 show that, following the policy change, affected jurisdictions are slightly more likely to pass GO bonds than before. However, panel a) of Figure 5

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 4 show the effect of Proposition 39 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 5 shows that this positive effect on overall education funding is concentrated in elections occurring in even years.Appendix Table A1 shows the main results, for both the jurisdiction-level and election-level panels, excluding community colleges. The results are almost identical.

5.4 Heterogeneity in Responses to the Policy Change

Lastly, we investigate how these jurisdiction level outcomes differ across districts with varying levels of diversity. We do this in two ways. First, we re-estimate equation 1, the effect of Proposition 39 on unconditional jurisdiction-level outcomes, and include an interaction term for whether the jurisdication was above or below the median share minority. Table 5 shows these results, which are comparable to those in Tables 2 and 4. The coefficient on "Post x Treat x High Minority" represents the difference in the effect between governments above the median percent non-white or Hispanic and governments below it. This median is calculated based on the 2000 census and is approximately 36%.[10] Columns 1 and 2 show that we cannot reject the hypothesis that the effect on proposing bonds is the same in high and low minority districts. However, the point estimates suggest that any positive effect is coming from high minority districts.

The results in columns 3 and 4 show similar results for the amount of bonding proposed, with no differential effects between high and low minority districts. Columns 5 and 6 show that the policy change had a larger effect on the propensity of high minority districts to propose a bond, while columns 7 and 8 show that high-minority districts were also more likely to approve more funding.

As a second approach we explore whether these differential effects of Proposition 39 across

[10]This is substantially lower than the overall percent minority in the state at that time due to the fact that non-white and Hispanic residents are more likely than white residents to live in larger jurisdictions.

districts are linear. The degree to which Proposition 39 loosened the constraints on school districts to propose bond funding may be related to how homogenous their population was. To do this, we estimate equation 1 at quintiles of the distribution of minority residents. Figure 6 plots the coefficient estimates for each quintile, with the horizontal axis being the share minority in each quintile. The first panel of the figure has a distinct concave shape. The shape suggests that districts with very high or very low share of minority residents—the most homogeneous districts—are the ones where the likelihood of bond passage was least affected by the loosening of the electoral constraint. In fact, districts with a very high share of minority residents had a coefficient close to zero, and not statistically significant. On the other hand, the most diverse districts had the highest treatment effects.

The second panel of the figure shows a similar shape for the effect on funding outcomes. Because of the difference in the effect on passage rates across districts, more diverse districts reached higher levels of per-resident funding than more homogenous ones. Appendix Figure A1 shows these figures with controls for county-year fixed effects, and the results are almost identical.

6 Conceptual Framework

In order to better understand these empirical results, we develop a simple model that considers the interaction between a representative member of the elected body and voters in setting a local government's expenditure on a public good. There is a set of voters of size 1. The residents have preferences, $U(g)$, over the level of spending on the public good g and an ideal level of the public good θ. U is assumed to be single-peaked and strictly increasing on $g < \theta$ with constant slope β and strictly decreasing on $g > \theta$ with constant slope $-\beta$. The politician also has single-peaked preferences over the spending on the public good, $V(g)$, with preferred level of the public good θ_p. However, that preferred level may be infinite if the politician is a budget-maximizer. We assume that $V(g)$ is weakly concave for all $g < \theta_p$, so the politician may be risk-neutral or risk-averse.

As in the Romer-Rosenthal agenda setting model the sequence of events is as follows. First, the government official chooses whether to propose a referendum to adopt a public good level $g' > g$ where g is the reversion level. If they do not propose a referendum the reversion level is adopted. If they do propose a referendum the voters then vote yes or no. If at least v voters vote yes, $g' > g$

is adopted, where $v \in [0,1]$. If fewer than v voters vote yes, g is adopted. We assume that at minimum a simple majority is required and so v is at least one half.

In order to introduce uncertaintin in the outcomes of proposals, and hence allow the model to rationalize failed proposals, we assume that there are shocks to voters preferences for the proposal that are unrelated to the level of expenditure proposed. In the fashion of a probabilistic voting model, voter i will vote in favor of a proposal g' if

$$U(g') \geq U(g) + \sigma_i + \delta,$$

where σ_i is an idiosyncratic preference shock representing their bias in favor of the reversion level and δ is an aggregate preference shock.[11] σ and δ are both uniformly distributed random variables; the former over the range $[-\phi, \phi]$ and the latter over the range $[-\psi, \psi]$. All voters with $\sigma_i \leq U(g') - U(g) - \delta$ will vote for the proposal. Due to the distributional assumptions on σ_i, the fraction of voters for whom this is true is given by

$$\pi(g') = P\left[\sigma_i \leq U(g') - U(g) - \delta\right] = \frac{\phi + U(g') - U(g) - \delta}{2\phi},$$

and given the distribution of δ, the probability that the proposal prevails is

$$p(g') = P\left[\pi(g') \geq v\right] = \frac{U(g') - U(g) - \phi(2v-1) + \psi}{2\psi}. \tag{3}$$

The probability of the proposal passing is increasing in the voter's preference for it relative to the reversion outcome and decreasing in the vote share required to win. As the variance of the voting shocks increase, it matters less what the proposal is as more of the outcome is random.[12]

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 maximize their expected utility over the possible outcomes when choosing what to

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

[12] 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 and so will pass or not pass depending on whether a 50% is sufficient for the proposal to prevail.

propose. Thus they will choose the proposal that solves

$$\max_{g'} p(g')V(g') + (1 - p(g'))V(g).$$

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

$$p'(g')\left[V(g') - V(g)\right] + p(g')V'(g') = 0 \tag{4}$$

This can be easily understood. The first term represents the fact that increasing the size of the proposal decreases the probability that it will prevail and hence decreases the probability that the politician will get to benefit from the higher level of the public good. The second term represents the additional benefit from the higher level, were the proposal to prevail. The optimal proposal balances these two effects. This implies that if $g < \theta$ and $\theta_p > \theta$ then g' will exceed θ. To see why, note that if this were not the case a small increase in the size of the proposal would increase both the chance that it would prevail and the politician's payoff if it did, violating equation 4. This means that if the politician prefers a higher level of the public good than the voter they will use their agenda-setting power to achieve a level higher than the voter's preferred level. If on the other hand $\theta_p = \theta$ then even if $g < \theta$ the politician will propose the voter's optimal level.

We are primarily interested in how the proposals, their likelihood of success, and the resulting public good levels change when the vote requirement changes. The former is given by

$$\frac{dg'}{dv} = \frac{2\phi V'(g')}{2U'(g')V'(g') + \left(\psi + U(g') - U(g) - \phi(2v-1)\right)V''(g')}, \tag{5}$$

and the effect of a change in the vote requirement on their likelihood of success is given by

$$\frac{dp(g')}{dv} = \frac{\phi}{\psi}\left[\frac{U'(g')V'(g')}{2U'(g')V'(g') + \left(\psi + U(g') - U(g) - \phi(2v-1)\right)V''(g')} - 1\right]. \tag{6}$$

If the politician was already going to propose their preferred level of the public good and as a result $V'(g') = 0$ then a small change in v will not change their proposal but it will change the likelihood that it succeeds. When this is not the case, the optimal proposal is decreasing in v.[13]

[13]To see this, note that $\psi + U(g') - U(g)$ must be at least zero for the proposal to have a positive chance of prevailing.

To understand what happens when this is not the case it is instructive to first the case where the politician is a risk neutral budget maximizer.

Without loss of generality we can assume that $V(g) = g$. In this case, Equation 5 simplifies to $\frac{dg'}{dv} = \frac{\phi}{U'(g')}$, which implies that an increase in the required vote-share decreases the size of proposals.[14] In this case it is then easy to show that the effect of an increase in the vote share requirement on the probability that the proposal will prevail is $\frac{dp(g')}{dv} = -\frac{\phi}{2\psi}$. When the politician is risk-averse and as a result $V''(g') < 0$, a change in the vote requirement will have a larger impact on both proposals and the likelihood of success.

In sum, the model presents a framework for understanding the effect of a change in the vote requirement on the behavior of local officials and voters. It shows how the change in policy that we study effects the proposals made by officials and how voters will vote on them. Specifically, it predicts that the change in the vote requirement will only change the proposals made if the official is not already able to achieve their ideal level of funding. However, it will change the probability that the proposal succeeds in either case. When they are non-zero both of these effects will be larger the greater degree of risk-aversion the official has. In the next section, we turn to the empirical specification to test these predictions.

7 Conclusion

In this paper we analyze how a legislative 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 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. 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. In addition, they more than doubled their funding per resident due to the change.

We interpret these results in the context of a political economy model of the interaction between a voter and an elected official. If elected officials were risk-neutral budget maximizers we would expect them to use all of their new found flexibility due to the lower vote requirement to pass larger

[14] To see this note that $V''(g')$ will equal zero, $V'(g')$ exceeds zero, and $U'(g')$ must be less than zero.

bonds and increase spending. In contrast, we find that most of the increase in bond spending that occurs happens because voters approve a larger portion of proposed bonds rather than that the size of bond proposals increases. This is consistent with two possibilities. First, elected officials may be quite risk averse and seek to avoid their proposal failing. As a result, they use much of their newfound flexibility to ensure that their proposals pass. Second, officials may not be 'budget-maximizers' after-all. While they may prefer a higher level of spending than the pivotal voter under the 66% vote requirement and such expand their spending, they will be satiated by modest increases in spending and not attempt to use their increased agenda setting power to maximum effect.

There are a number of policy implications of our findings. The policy change seemed to work as intended in part. The lowering of the threshold more than doubled funding from GO bonds for districts that approved a bond. However, the policy change did not expand the set of school districts that proposed a GO bond. In that sense, Proposition 39 likely just increased funding for districts that would have proposed smaller amounts absent the policy change.

The large increases in school capital funding likely led to further downstream outcomes. A growing literature investigates the effects of school construction, and capital bonds in particular. Large school construction projects, mostly set in developing countries, may lead to improved student outcomes (Aaronson and Mazumder, 2011; Duflo, 2001; Neilson and Zimmerman, 2014). The literature on school capital improvement bonds, however, has consistently shown limited effects on student outcomes, but large effects on local housing prices (Cellini, Ferreira and Rothstein, 2010; Martorell, Stange and McFarlin Jr, 2016; Conlin and Thompson, 2017; Choi, 2019). Thus, the overall effect of Proposition 39 may have been capitalized into housing prices, without an effect on student outcomes.

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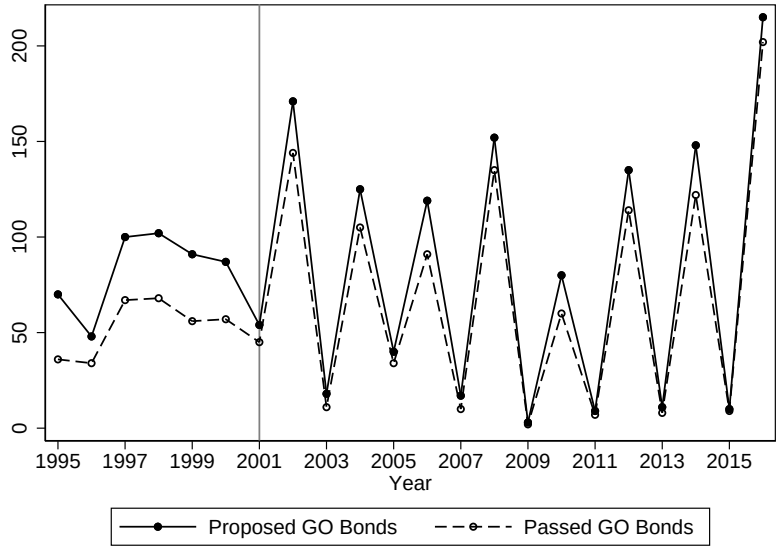
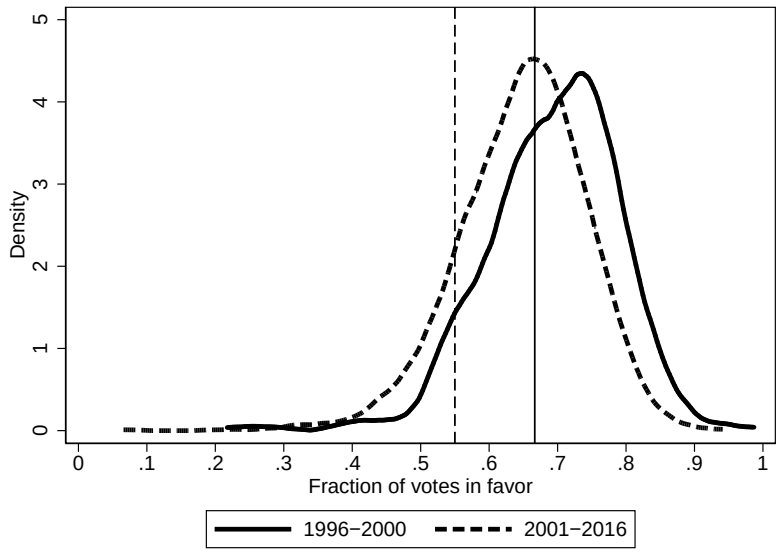
Figure 1: Number of Proposed and Passed Education GO Bonds, 1995-2016



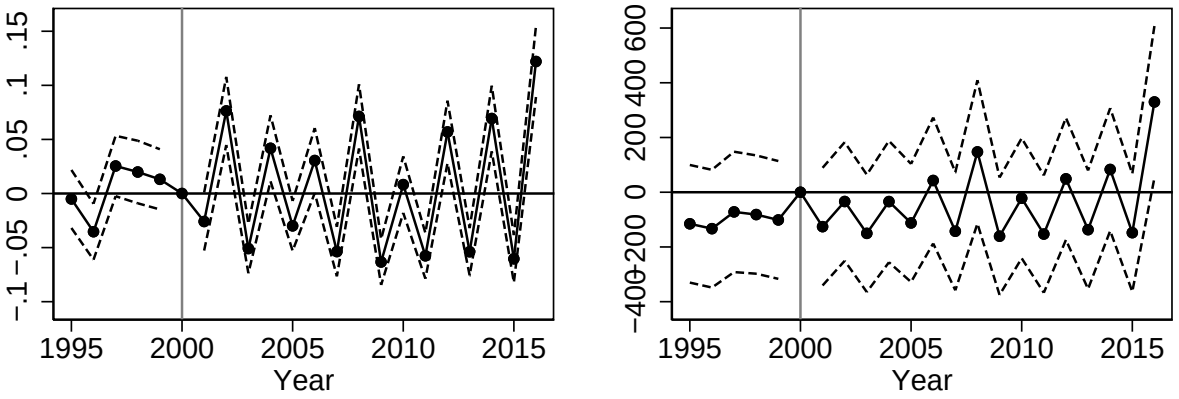
The graph shows general obligation bonds by K-12 school districts and community colleges from data described in section 3.

Figure 2: Vote Share Density Functions of Education Related Bond Elections, Before and After Policy Change



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.

Figure 3: Effect on Government Bond Proposal Behavior

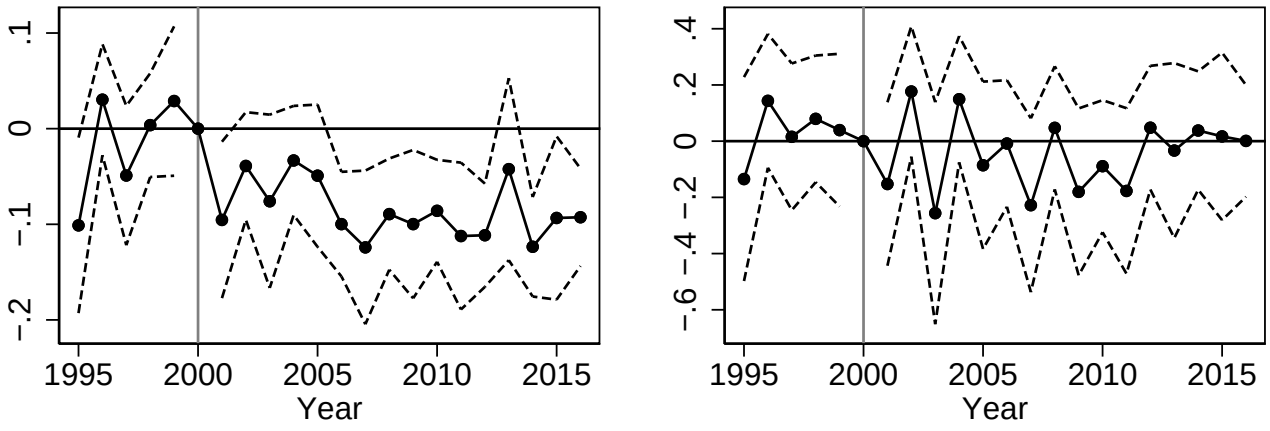


a) Proposed bond

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 but constrained to zero in 2002. 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.

Figure 4: Effects on Vote Share and Pass Rates of Proposed Bonds

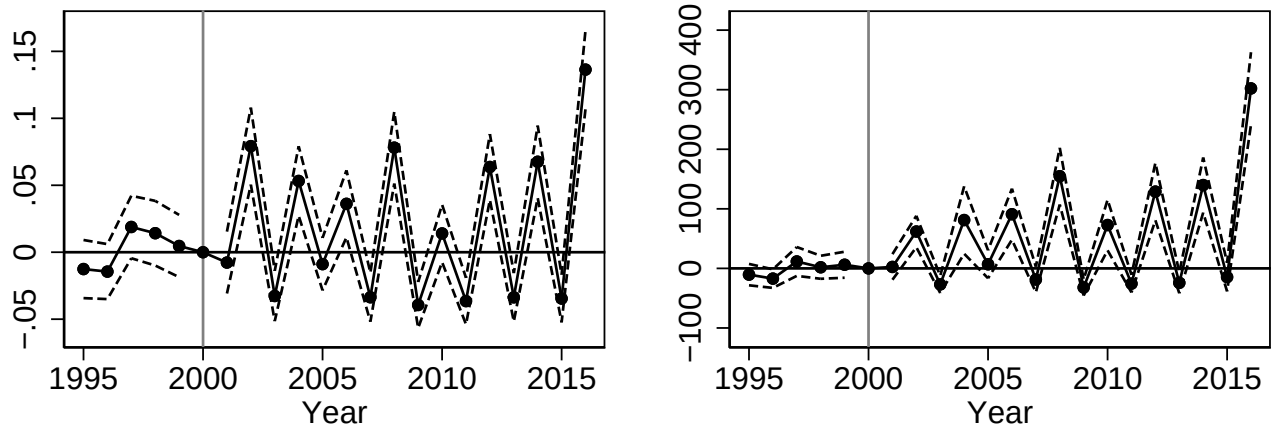


a) Vote Share

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 but constrained to zero in 2002. The dashed lines illustrate 95% confidence intervals which allow for clustering at the government level.

Figure 5: Effect on government level outcomes

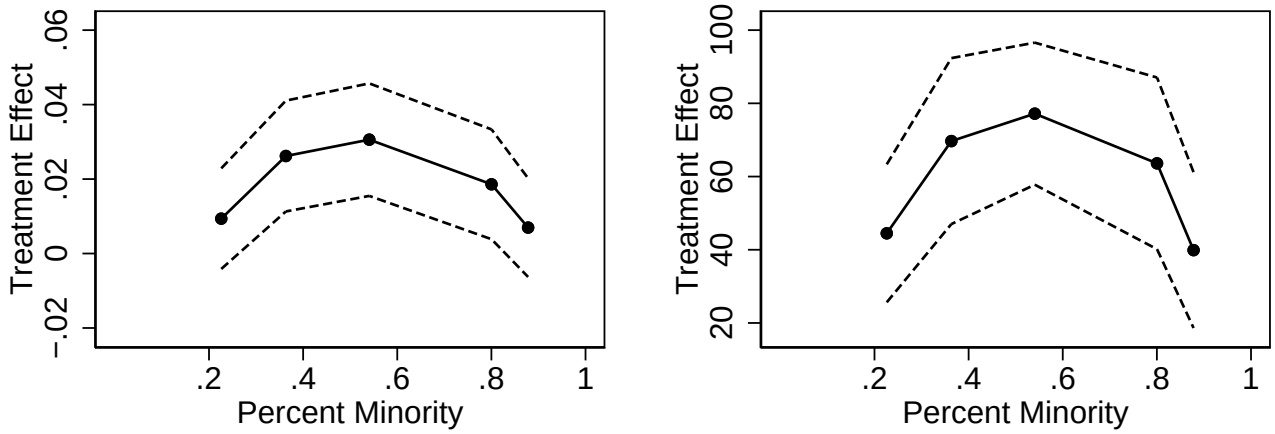


a) Bond passed

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 but constrained to zero in 2002. 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.

Figure 6: Effect of Proposition 39 on Jurisdiction-Level Outcomes by Quintile of Percent Minority



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 percent of jurisdiction residents who are either Hispanic or non-white. 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.

Table 1: 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.

Table 2: 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. * $p < .05$ ** $p < .01$ *** $p < .001$

Table 3: Effect of Proposition 39 on Election-Level Results

	(1)	(2)	(3)	(4)	(5)	(6)
	Election Vote Share			Election Approved		
Post x Treat	-0.0776***	-0.0782***	-0.0519*	-0.0346	-0.0631	0.213*
	(0.0104)	(0.0117)	(0.0251)	(0.0414)	(0.0466)	(0.0929)
Y-Mean	0.632	0.633	0.653	0.666	0.669	0.742
N	4207	3948	2040	4207	3948	2040
R-sq	0.472	0.601	0.0851	0.370	0.520	0.0810
Govt. FE	X	X		X	X	
Year FE	X		X	X		X
Year X County FE		X			X	
Govt Type FE			X			X
GO Bond Only			X			X

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

Table 4: 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. * $p < .05$ ** $p < .01$ *** $p < .001$

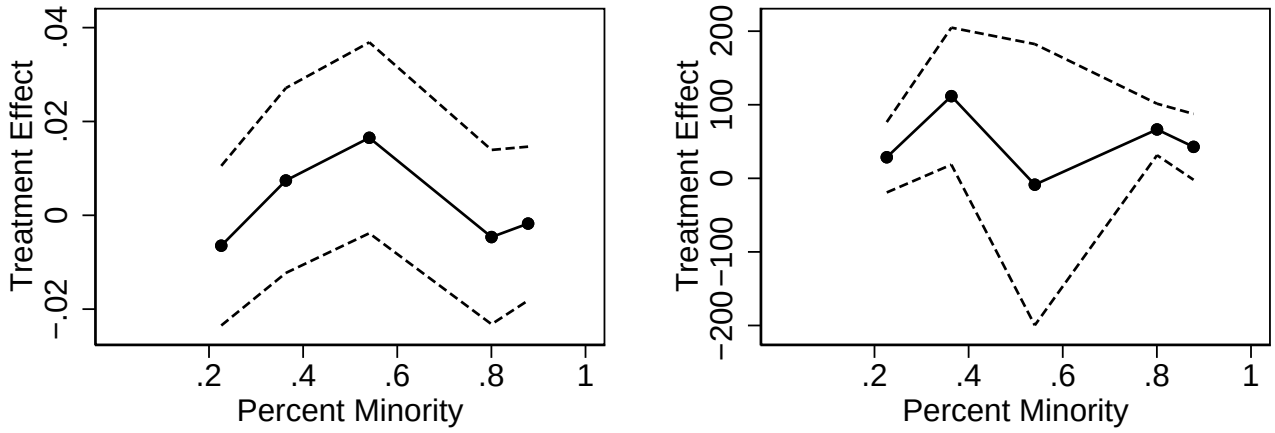
Table 5: Heterogeneity by Percent Minority in Effect of Proposition 39 on Jurisdiction-Level Outcomes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Proposed Bond		Proposed $/Res		Approved Bond		Approved $/Res	
Post x High Minority	-0.00100	0.000857	-3.337	10.96	0.00445	0.00503	1.263	-5.532
	(0.00430)	(0.00585)	(3.676)	(26.18)	(0.00303)	(0.00438)	(2.362)	(5.970)
Post x Treat x High Minority	0.0101	0.00806	15.60	-3.985	0.0133*	0.0141*	23.74*	18.31
	(0.00857)	(0.00880)	(46.79)	(48.32)	(0.00661)	(0.00681)	(9.916)	(10.85)
Post x Treat	-0.00275	-0.00336	40.82**	67.14**	0.0113*	0.0101*	46.55***	55.93***
	(0.00572)	(0.00608)	(14.37)	(21.45)	(0.00443)	(0.00473)	(6.673)	(7.431)
Y-Mean	0.0549	0.0547	82.27	82.28	0.0426	0.0425	53.23	53.24
N	34892	34826	34672	34606	34892	34826	34672	34606
R-sq	0.110	0.147	0.0732	0.122	0.0965	0.134	0.0767	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 percent non-white or Hispanic. 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. * $p < .05$ ** $p < .01$ *** $p < .001$

A1 Appendix Figures & Tables

Figure A1: Effect of Proposition 39 on Jurisdiction-Level Outcomes by Quintile of Percent Minority, with County by Year Fixed Effects



a) Proposed bond

b) Proposed $/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 either Hispanic or non-white. The outcome in panel a) is an indicator for whether the government proposed one or more GO bonds that year. The outcome in panel b) is the dollar amount of bonds proposed 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.

Table A1: Effect of Proposition 39 on Jurisdiction-Level and Election-Level Outcomes, Excluding Community Colleges

	(1) Proposed Bond	(2) Proposed $/Res	(3) Vote Share	(4) Approved	(5) Approved Bond	(6) Approved $/Res
Post x Treat	-0.00372	46.38	-0.0778***	-0.0428	-0.0178**	56.87***
	(0.00434)	(23.84)	(0.0123)	(0.0489)	(0.00587)	(5.235)
Y-Mean	0.0530	83.05	0.630	0.669	0.0799	53.25
N	33308	33088	4344	4344	33308	33088
R-sq	0.110	0.0730	0.508	0.402	0.130	0.0756
Year FE	X	X	X	X	X	X
Govt. FE	X	X			X	X
County FE			X	X		
Unit of Obs.	Juris	Juris	Election	Election	Juris	Juris

Note: Estimates of the effect of decreasing the vote share requirement. Columns 1 and 2 correspond to estimates in Table 2, columns 3 and 4 to Table 3 and 5 and 6 to Table 4. Standard errors allow for clustering at the government level. * $p < .05$ ** $p < .01$ *** $p < .001$

Table A2: Effect of Proposition 39 on the Size of Proposed Bonds

	(1)	(2)	(3)	(4)
	$/resident		log($/resident)	
Post x Treat	0.456*	0.326*	-0.423	-0.473
	(0.181)	(0.156)	(0.272)	(0.460)
Y-Mean	1.397	1.249	6.676	6.662
N	1996	1446	1992	1441
R-sq	0.934	0.741	0.750	0.799
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 2. Each observation represents a proposed bond. The outcome in columns 1 and 2 is the proposed dollars of bonding per resident. The outcome in columns 3 and 4 is the log of the proposed dollars of bonding per resident. Standard errors allow for clustering at the government level. * $p < .05$ ** $p < .01$ *** $p < .001$

Table A3: Effect of Proposition 39 on the Logged Size of Proposed and Passed Bonding

	(1)	(2)	(3)	(4)
	log(Proposed \$/Resident+1)		log(Passed \$/Resident+1)	
Post x Treat	0.0520	0.0539	0.146***	0.154***
	(0.0273)	(0.0297)	(0.0210)	(0.0236)
Y-Mean	0.372	0.371	0.287	0.287
N	34672	34606	34672	34606
R-sq	0.109	0.146	0.0964	0.134
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 the log of one plus 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 columns 3 and 4 is the log of one plus the dollar amount the government passed 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. * $p < .05$ ** $p < .01$ *** $p < .001$