Can Competition Tame the Leviathan? Evidence from California’s Proposition 39

Abstract - In 2000, Californians voted on Proposition 39, a statewide ballot initiative that called for reducing the supermajority vote requirement on local school bond measures from two-thirds to 55 percent. This paper develops a model of voting behavior on that initiative. Our model predicts that support for lowering the supermajority vote requirement should increase as the degree of competition among school districts increases. Our analysis of vote returns from Proposition 39 supports this hypothesis. All else equal, moving from an area with little or no competition to an area with significant competition leads to a 13 percentage point increase in support for Proposition 39.

INTRODUCTION

When budget-maximizing behavior on the part of local government leads to tax and expenditure outcomes that deviate from the desires of local voters, voters have an incentive to impose constraints on government behavior. So goes the argument for why tax and expenditure limits, such as California’s Proposition 13 and Massachusetts’s Proposition 2 ½, were originally passed by voters. Of course the argument works in reverse as well: if local governments remain unresponsive to the desires of local voters, voters have an incentive to maintain policies that limit their behavior. In this paper, we investigate that possibility using vote outcomes from a recent statewide initiative in California designed to make it easier for school districts to increase capital spending.

Prior to 2000, local school bond measures in California required a two-thirds supermajority to pass. If voters approved a bond issue, the bonds were then repaid with local property tax increases that remained in effect until the bonds were fully repaid. In 2000, Californians voted on two statewide initiatives designed to ease this supermajority vote requirement. In March of 2000, Californians voted on Proposition 26, an initiative that would have reduced the vote requirement on school bond measures to a simple majority. Despite the fact that Proposition 26 required only a simple majority for approval, the initiative failed, receiving just 47 percent of the popular vote. In November of 2000, Californians voted on Proposition 39, an initiative that was nearly identical to Proposition 26 except it called for reducing the vote requirement on...
local school bond measures to 55 percent. This time California voters approved the measure, but only by the narrowest of margins: Proposition 39 received only 53 percent of the popular vote.

The vote outcomes on Proposition 26 and Proposition 39 present something of a puzzle: if the traditional decisive-voter model of local government behavior was operative in California, it is difficult to see how either of the two initiatives could have failed. To illustrate that point, consider an initiative like Proposition 39 to reduce the supermajority required to approve local school spending from 66.7 to 55 percent. The initiative amounts to a referendum on who ought to be the decisive voter: the current decisive voter, whose desired level of spending lies at the 33rd percentile of all desired spending levels in the community, or a new decisive voter in the 45th percentile of desired spending. If local spending decisions serve the decisive voter, the outcome of such an initiative appears clear. The 33.3 percent of residents with desired spending less than or equal to the current decisive voter vote “no;” the prospect of increased spending is undesirable to those who already prefer less than the existing spending level. Similarly, the 55 percent of residents with desired spending greater than or equal to the proposed new decisive voter vote “yes;” a spending increase moves them closer to the spending level they desire. Voters in the range of desired spending in between these two voters (less than 12 percent of voters) could vote either way, but surely some would support the initiative. Consequently, a minimum of 55 percent of voters should support the initiative. By a similar logic, Proposition 26, the initiative to reduce the vote requirement from two-thirds to a simple majority, should have received a minimum of 50 percent of the popular vote.

However, Proposition 26 did fail and Proposition 39 passed with only 53 percent of the popular vote, contradicting the predictions of the traditional decisive voter model and suggesting that some other model of local government may be at work. A likely candidate is the Leviathan/budget-maximizing model. For example, Romer, Rosenthal and Munley (1992) and, more recently, Balsdon, Brunner and Rueben (2003) demonstrate that agenda control in the hands of budget-maximizing school boards pushes school spending above the level desired by the decisive voter and leads to weaker overall support for new spending. Perhaps that explains why support for Propositions 26 and 39 was weaker than would be predicted by the traditional decisive voter model. Thus, in this paper, we ask: did budget-maximizing behavior on the part of local school boards reduce voter support for Propositions 26 and 39?

To address that question, we exploit the fact that school boards must possess agenda control in order to maximize their budgets and inter-jurisdictional competition is likely to limit that control. For example, Brennan and Buchanan (1980) and Epple and Zelenitz (1981) demonstrate that competition among local governments limits the monopoly power of local bureaucrats and, thus, constrains their ability to pursue budget-maximizing agendas. Furthermore, numerous studies have found that inter-jurisdictional competition tends to reduce the size of the local public sector. Using data on California school districts in 1993, Marlow (2000) finds that spending per pupil tends to be significantly lower in counties with greater inter-distric competition. Simi-

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1 McGuire (1999) makes a similar argument in her review of the literature on property tax limitation measures such as Proposition 13. Specifically, she argues that existing empirical evidence on the effects of property tax limitation measures suggests the Leviathan model may be operative.

2 See, for example, Zax (1989) and Figlio and O'Sullivan (2001). For a comprehensive review of the literature on competition and government size, see Taylor (2000).
larly, using a national sample of school districts, Hoxby (2000) finds a negative and statistically significant relationship between school district spending per pupil and the degree of inter–district competition within a metropolitan area.

We build on the aforementioned literature by examining whether vote outcomes on Proposition 39 are related to the market power of local school boards. If competition constrains the market power of local school boards, vote outcomes on Proposition 39 should be positively related to the degree of inter–jurisdictional competition. To test that hypothesis, we regress the fraction of “yes” votes on Proposition 39, measured at the census block group level, on a set of block group characteristics, school district characteristics, and a Herfindahl index designed to measure the degree of inter–district competition. As hypothesized, we find a positive and statistically significant relationship between the fraction of “yes” votes and the degree of inter–jurisdictional competition. Furthermore, our results suggest the magnitude of that relationship is relatively large: an increase in the Herfindahl index from zero (no competition) to one (significant competition) generates a 13 percentage point increase in support for Proposition 39.

CONCEPTUAL FRAMEWORK

In reducing the supermajority vote requirement on school bond measures from 66.7 to 55 percent, the central aim of Proposition 39 was to make it easier for school districts to increase school spending. Much about an individual’s likely voting behavior on such a Proposition can be summarized simply. Let $S^0$ denote the existing level of school spending, and $S'$, the level of school spending that would prevail if Proposition 39 passed. An individual should vote in favor of the Proposition if she prefers $S'$ (including her share of the higher tax bill) to $S^0$. In this section, we expand on this straightforward logic to illustrate how individual characteristics, school district characteristics, and the degree of inter–jurisdictional competition influence voting behavior on Proposition 39.

As a starting point, let $S^*_i$ denote individual i’s desired level of school spending. Desired spending will depend on the individual’s income, $y$, tax price, $p$, and a vector of other individual characteristics $z$. We express this demand function as $S^*_i = S(y, p, z)$. If preferences for school spending are single peaked and symmetric around $S^*_i$, the indirect utility comparison of $S^0$ and $S'$ amounts to an evaluation of which spending level is closer (in dollars) to $S^*_i$. Figure 1 illustrates that point. The vertical axis measures the indirect utility level associated with different levels of school spending, which is measured along the horizontal axis. As is evident from the figure, the indirect utility comparison amounts to an evaluation of whether $S^*_i$ lies to the right or left of the midpoint of $S^0$ and $S'$. If $S^*_i$ is greater than the midpoint, as depicted, voter $i$ prefers $S'$. If $S^*_i$ is smaller than the midpoint, voter $i$ prefers $S^0$. The indirect utility comparison can therefore be expressed as:

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3 We focus on Proposition 39, rather than Proposition 26, for several reasons. First, the vote on Proposition 39 took place during a Presidential election, while the vote on Proposition 26 took place during a primary election. As a result, voter turnout for Proposition 26 was approximately 40 percent lower than for Proposition 39. Since our theoretical and empirical framework assumes full (or random) voter turnout, the low voter turnout for Proposition 26 presents a problem. Second, a number of communities, located primarily in a few counties, failed to report election results for Proposition 26.

4 This is the level an individual would choose if $S$ were a private good with a unit price of $p$. Elements of $z$ might include political party affiliation, age, availability of private school alternatives, etc.

5 We assume preferences for school spending are symmetric for ease of exposition and to simplify the analysis. However, none of the results that follow depends on this assumption.
From [1] it follows that individual $i$ votes "yes" on Proposition 39 if $V_i > 0$ and votes "no" if $V_i \leq 0$. Equation [1] also makes it clear that any factor that increases individual $i$'s desired level of spending, $S_i^*$, increases the likelihood of a "yes" vote. For example, higher income, $y_i$, increases the likelihood of a "yes" vote since it moves $S_i^*$ closer to $S'$. Of more subtle importance are the influences of $S_0$, the existing or "reversion" level of school spending, and $S'$, the spending level that will prevail if the Proposition passes. From [1] it is evident that higher levels of either reduce the appeal of Proposition 39 to an individual voter. Intuitively, voters are less likely to favor a Proposition that will increase spending when the existing level is already high or when the proposed increase is large. Note, however, that unlike $S_0$, $S'$ is not directly observed by voters since it represents some future spending level that will prevail if Proposition 39 passes. That fact leads naturally to the question of what determines $S'$.

We have argued that Proposition 39 was essentially a referendum on who ought to be the decisive voter: the current decisive voter whose preferred level of spending lies in the 33rd percentile of all desired spending levels in the district or a new decisive voter whose preferred level of spending lies in the 45th percentile. Let $S_{45} = S(y_{45}, p_{45}, z_{45})$ denote this proposed decisive voter’s desired spending level. Since spending after Proposition 39 must meet the approval of the new decisive voter, $S'$ clearly depends on $S_{45}$ and, therefore, on the income, tax price, and other characteristics of this individual. What else determines $S'$ is a somewhat more controversial matter of political economy.

The traditional decisive voter model adopts the simple assumption that $S' = S_{45}$, i.e., local school boards target the desires of the decisive voter. Underlying this model is the assumption of a competitive political process under which any agenda deviating from the desires of the decisive voter loses to the one that does not. The literature on budget–maximizing bureaucracy, however, suggests that when school boards are insulated from
political competition and can, therefore, exert control over the agenda, spending levels may exceed the desired level of spending of the decisive voter (e.g., Romer and Rosenthal (1979, 1982)). Thus, with budget-maximizing agenda setting, \( S' \) can be expressed as:

\[
S' = (1 + \theta) \cdot S_{45}^*,
\]

where \( \theta \) is the degree of agenda control within a district. When \( \theta \) equals zero, school boards are unable to pursue budget-maximizing agendas and, thus, \( S' = S_{45}^* \). When \( \theta \) is greater than zero, the post–approval level of spending exceeds the desired level of spending of the decisive voter.\(^6\)

What determines the amount of agenda control school boards possess? Brennan and Buchanan (1980) and Epple and Zelenitz (1981) among others argue that one important factor is the degree of inter–jurisdictional competition.\(^7\) For example, Epple and Zelenitz (1981) demonstrate that inter–jurisdictional competition limits the monopoly power of local governments and, therefore, reduces the ability of local governments to impose spending levels that deviate from the desires of the decisive voter. To incorporate the role inter–jurisdictional competition plays in determining \( \theta \), let \( \theta = \theta(C) \), where \( C \) is the degree of inter–jurisdictional competition. The hypothesis that inter–jurisdictional competition limits the monopoly power of local school boards is \( \partial \theta / \partial C < 0 \).

Equation [2] and the discussion above suggest that inter–jurisdictional competition affects voting behavior on Proposition 39 through its effect on \( S' \). Specifically, an increase in the degree of inter–jurisdictional competition reduces the agenda control of local school boards. As a result, it constrains the post–approval level of spending, \( S' \), which leads to greater overall support for Proposition 39. That point can be illustrated directly by substituting [2] into [1] which yields:

\[
V_i = S(y, p, z) - \frac{1}{2} S_0 + (1 + \theta) \cdot S(y_{45}^{*}, p_{45}^{*}, z_{45}^{*}).
\]

Since \( \partial \theta / \partial C < 0 \), an increase in the degree of inter–jurisdictional competition increases support for Proposition 39. Equation [3] also illustrates that any factor that increases voter \( i \)'s demand for school spending increases the likelihood of a "yes" vote while any factor that increases the new decisive voter's demand for school spending decreases the likelihood of a "yes" vote. For example, an increase in voter \( i \)'s income increases the likelihood of a "yes" vote, while an increase in the new decisive voter’s income decreases the likelihood of a "yes" vote.

**EMPIRICAL FRAMEWORK**

The model developed in the previous section describes individual voting behavior on Proposition 39. However, as we discuss in more detail in the next section, our data on vote outcomes from Proposition 39 consists of block group level vote tallies. In order to derive an empirical model that utilizes aggregated vote tallies, we follow Deacon and Shapiro (1975) and make several assumptions about the distribution of preferences within block groups. Specifically, assume that the distribution of \( V_i \)'s within a block group can be characterized by the mean, \( \bar{V} \), and variance, \( \sigma^2 \). For block group \( j \), denote this distribution: \( g_j(\bar{V}_j, \sigma^2) \). Furthermore, as-

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\(^6\) With symmetric preferences, it can be shown that the maximum value of \( \theta \) is: \( 1 - S'/S_{45}^* \).

\(^7\) Epple and Zelenitz (1981) demonstrate that the degree of agenda control will depend on two factors: the size of a given jurisdiction and the number of competing jurisdictions. In the empirical work that follows, we use a measure of inter–jurisdictional competition (namely a Herfindahl index of school district enrollment shares) that captures both of these aspects of agenda control.
sume that mean desired spending within a block group, $\bar{S}$, is solely a function of the mean attributes of the block group: $\bar{S} = S(\bar{y}, \bar{p}, \bar{z})$. The mean of $V$ for block group $j$ is then $\bar{V}_j = S(\bar{y}_j, \bar{p}_j, \bar{z}_j) - 1/2(S^0 + S)$ and the probability that a randomly selected individual will vote “yes” is:

$$P(\text{yes}) = \int_0^\infty g_j(V_j, \sigma_j^2) dV.$$  

To transform [4] into a form that is amenable to estimation, we assume that: (a) within block group $j$, $g(.)$ is distributed logistic, (b) all distributions possess a common variance such that $\sigma_j^2 = \sigma^2$, and (c) $\bar{V}_j$ is a linear function of its arguments. Applying these assumptions to equation [4] yields the following empirical specification:

$$\logit_{lkj} = \beta_0 + \beta_1 Cl_l + \beta_2 y_{lkj} + \beta_3 p_{lkj} + \beta_4 z_{lkj} + \beta_5 y_{lkj}^45 + \beta_6 p_{lkj}^45 + \beta_7 z_{lkj}^45 + \beta_8 S_{lkj}^0 + \varepsilon_{lkj},$$

where $\logit_{lkj}$ denotes the logistic transformation of the fraction of “yes” votes for block group $j$, in school district $k$, in educational market $l$, and $\varepsilon_{lkj}$ is a random disturbance term.

The model outlined in the previous section suggests that if inter-jurisdictional competition constrains the market power of local school boards, $\beta_1$ should be positive. Furthermore, the model predicts support for Proposition 39 should be positively related to any variable that increases the desired level of spending of residents within a block group and negatively related to any variable that increases the desired level of spending of the new decisive voter. For example, in terms of equation [5], the model predicts $\beta_2$ should be positive and $\beta_3$ should be negative.

**DATA**

Block group level data on vote outcomes for Proposition 39 were obtained from the Statewide Database, maintained by the Institute of Governmental Studies at the University of California, Berkeley. The database contains aggregate vote outcomes and voter registration information for all statewide primary and general elections held in California since 1990. We use the December 2000 definitions of metropolitan and micropolitan statistical areas, developed by the Office of Management and Budget (OMB), to define educational markets. Metropolitan areas are defined as urbanized areas with a population of at least 50,000, while micropolitan areas are defined as urbanized areas with a population of at least 10,000, but fewer than 50,000. Both metropolitan and micropolitan areas are defined in terms of counties and include both the county containing the central core of the urbanized area and adjacent counties that have a high degree of economic integration as measured through commuting patterns. Of the 58 counties in California, 46 are located in one of the 37 metropolitan or micropolitan areas within the state.

Following Hoxby (2000) and others, we use a Herfindahl–style index, based on school district enrollment shares, to measure the degree of inter-jurisdictional competition within an educational market. Specifically, for metro area $l$, the index we employ is: $C_l = 1 - \sum_{k=1}^{\text{total}} \frac{e_k^2}{e_l^2}$, where $e_k$ is total enrollment in district $k$ in metro area $l$ as a share of total metropolitan enrollment. The index ranges in value from zero to one, with a value of zero indicating that...
there is only one district in the metro area and a value of one indicating that there are many small districts. Thus, larger values of \( C_i \) are associated with a greater degree of inter-district competition.

To ensure that our measure of inter-jurisdictional competition was not simply picking up other market-specific factors that affect vote outcomes, we included five additional market-level variables in our analysis. Those variables are: the log of metro area population, metro area population density, the log of mean metro area household income, a Gini index of household income inequality, and an index of racial heterogeneity. All five of these variables were constructed using county-level data from the 2000 Census aggregated to the metro area. Controlling for income and racial heterogeneity within markets is particularly important. For example, Alesina, Baqir and Hoxby (2004) find that markets with greater income and/or racial heterogeneity tend to have more school districts, a result they attribute to household preferences for homogeneity. Thus, if we did not include controls for income and racial heterogeneity, and those factors affected support for school spending, our estimates of the effect inter-district competition has on support for Proposition 39 would be biased.

We used nine variables to describe the desired level of spending of voters within a block group. Consistent with the empirical framework outlined in the previous section, the first two variables are the average income and average tax price of voters. Our measure of the average income is mean household income, which was constructed using block-group level data from the 2000 Census. Because school bond issues are financed through the local property tax, a voter’s tax price is the voter’s share of any increase in property taxes needed to finance a school bond issue. Specifically, the amount a voter must pay for each dollar of bond financed school spending is the assessed value of the voter’s home divided by total assessed value of property within the voter’s district. We measured the average tax price of voters within a block group as \( \bar{A}_{kj}/TA_k \), where \( \bar{A}_{kj} \) denotes the average value of homes in block group \( j \), located in district \( k \), and \( TA_k \) denotes the total assessed value of property in district \( k \). Data on the average value of homes within block groups were obtained from the 2000 Census, while data on the total assessed value of property within a district in 2000 were obtained from the Coalition for Adequate School Housing, a California school advocacy organization.

Note that the Census only provides data on the market value of homes, not the assessed value of homes. That distinction is particularly important in California where assessed value may differ markedly from market value due to Proposition 13, the 1978 statewide proposition that capped property tax rates at one percent of assessed valuation throughout the state. Proposition 13 also changed when and how property was assessed for tax purposes in California. Specifically, after the passage of Proposition 13, property could only be reassessed upon a change in ownership, at which point the property was assessed at full market value. As a result, the assessed value and market value of homes in California can differ substantially depending on when a home was purchased. In general, the longer a resident has lived in their home, the larger the gap between market value and assessed value. In light of that fact, we also included the median number of years that homeowners within

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9 The racial heterogeneity index we employ is: \( H_l = 1 - \sum_{r=1}^{R} S_{rl}^2 \), where \( S_{rl} \) is racial group \( r \)'s share of the population in metro area \( l \). Greater values of this index are associated with greater racial heterogeneity.

10 Our measure of tax price assumes that all residents within a block group are homeowners. When renters are present, the average tax price is not well defined since the tax price facing renters depends on the incidence of the property tax on rental housing. We wish to thank an anonymous referee for pointing this out.
a block group have lived in their current residence. This variable is designed to control for systematic differences across block groups in the market value and assessed value of homes.

The remaining six block group level variables are: the fraction of voters that are registered Republicans, the fraction of households that are renters, the fraction of the population age 18 or older that are white, the fraction of residents age 25 or older with a college degree, the fraction of households with no school-age children, and the fraction of school-age children that attend private school. All these variables are designed to capture variation in preferences for local tax-financed school spending. The fraction of registered Republicans variable was constructed from voter registration information contained in the Statewide Database. All other variables were constructed using block group level data from the 2000 Census.

We used five variables to describe the desired level of spending of the proposed new decisive voter within a school district. The first variable is the decisive voter’s income. Recall that the proposed new decisive voter is the voter whose desired level of spending is at the 45th percentile of all desired spending levels in the district. Following the tradition of median voter studies, we assume the decisive voter is also the voter with the 45th percentile level of income in the community. To construct an estimate of the decisive voter’s income, we used district-level data from the 2000 Census on the distribution of household income. Specifically, the 2000 Census contains information on household income grouped into 17 income categories. We used this grouped income data and linear interpolation to estimate the 45th percentile level of income in each district.

The second variable is the decisive voter’s tax price. We assume the value of the decisive voter’s home lies in the 45th percentile of district housing values. For each district, we used data from the 2000 Census on the distribution of house values (which are grouped into 25 categories) to estimate the 45th percentile level of house values. We then constructed the decisive voter’s tax price as $A_{45}/TA$, where $A_{45}$ denotes the 45th percentile level of house values within a district. The third variable is the median number of years that homeowners within a district have lived in their current residence. We include this variable to control for systematic differences across districts in the assessed value and market value of homes. The last two variables are the fraction of voters within a district that are registered Republicans and the fraction of residents within a district that are age 18 or older and white. We include these two variables to capture variation across districts in the decisive voter’s preferences for school spending.

We also included five other district-level variables in our analysis. Those variables are: the growth rate of student enrollment, which is measured as the annualized growth rate of district enrollment over the period 1995–96 to 1999–2000, district population density, an indicator variable for districts located in urban areas, district enrollment, and a Gini index of household income inequality. We included district population density, the dummy variable for urban districts and district enrollment to control for differences in land acquisition costs across districts (which may affect demand for school capital spending) and economies of scale in the production of school quality. Similarly, we included a Gini index of household income inequality to further control for the heterogeneity of voter preferences within districts.

Previous studies have found that support for school spending is lower when there is a mismatch between the race of voters and the race of school-age children. For example, using county-level data on school spending in 1970, 1980, and 1990, Ladd and Murray (2001) find that spending per pupil tends to be significantly lower in counties where a substantial portion
of the population age 17 or older belongs to a different racial group than the school-age population. Poterba (1997) reaches a similar conclusion using state-level data. Both Ladd and Murray (2001) and Poterba (1997) measure racial mismatch as the difference between the fraction of school-age children that are nonwhite and the fraction of older individuals that are nonwhite. Thus, their results suggest that white voters are less likely to support school spending when a significant fraction of the school-age population in their community is nonwhite. To examine whether racial mismatch affected support for Proposition 39, we also included an interaction between the fraction of voter’s in block group $j$ in school district $k$ that are white, and the fraction of public school students in district $k$ that are nonwhite. If support for school spending among white voters declines as the fraction of nonwhite students within a district increases, the coefficient on this interaction term should be negative.

Finally, we used two variables to measure the reversion level of school spending. The first variable is the amount of bond revenue per pupil raised by school districts through the referendum process. Because school districts tend to hold bond referenda infrequently, we define local bond revenue per pupil as the annualized average of all bond revenue raised by a school district during the five–year period just prior to the vote on Proposition 39. The five–year period includes all bonds issued by school districts between November 1st 1995 and November 1st 2000.

Data on school district bond issues were obtained from Ed Source, a nonprofit organization that conducts research on K–12 education issues in California. The second variable is the amount of per–pupil revenue school districts receive for capital investment from revenue sources that are not subject to the referendum process (i.e., all other revenue sources). Specifically, we define other revenue sources as the sum of all capital revenue available to a school district in a given year less local general obligation bond revenue. To be consistent with the way we measure bond revenue, we measure other revenue sources as the annualized average of all other revenue sources available for capital investment during the five–year period just prior to the vote on Proposition 39. Data on school district capital revenue were obtained from school district accounting records provided by the California Department of Education.

Our data have a number of limitations. The first limitation concerns school districts with overlapping boundaries. Specifically, California contains three types of school districts: unified districts, elementary districts and high school districts. The boundaries of the latter two types of districts overlap: one high school district typically contains two or more elementary districts. Thus, in non–unified districts there are really two decisive voters: the decisive voter for the elementary school district and the decisive voter for the high school district into which the elementary district feeds. That fact has ramifications for our empirical work since in non–unified districts it becomes unclear how one should measure the desired level of spending of the new decisive voter or the reversion level of spending. In the analysis that follows, we use two approaches to address this issue. The first approach is to create a baseline sample for the analysis that includes only unified school districts. Focusing solely on unified districts eliminates the problem of overlapping school district boundaries and, thus, allows us to clearly identify the decisive voter in a district. The second approach is to create a sample that contains both unified districts and elementary districts. The drawback

\[11 \text{ Recall that Proposition 39 was an initiative on school capital spending and, thus, a district’s reversion level of spending should reflect capital investment in school facilities prior to the vote on Proposition 39.}
\[12 \text{ The five–year period includes all bonds issued by school districts between November 1st 1995 and November 1st 2000.} \]
to this approach is that it assumes the decisive voter for the elementary district is the same as the decisive voter in the high school district into which the elementary school feeds. However, this approach allows us to create a sample that includes all block groups and school districts in California. We estimate separate regressions using each of these samples.

The second limitation concerns block groups that overlap school district boundaries. Although the majority of block groups are located completely within the boundaries of a single school district, some block groups cross district boundaries. Since we wish to match vote outcomes on Proposition 39 with district-specific characteristics, these block groups obviously present a problem. Census blocks, however, are located completely within the boundaries of a single school district. Consequently, in cases where a block group spanned more than one district, we measured vote outcomes on Proposition 39 and the fraction of voters that were registered Republicans at the block level rather than the block group level.

The final limitation concerns missing observations. Data on the fraction of voters supporting Proposition 39 was unavailable for 44 of the 16,958 block groups in our unified district sample and 83 of the 24,683 block groups in our unified and elementary district sample. Similarly, Census data on the characteristics of residents was unavailable for 185 of the block groups in our unified sample and for 251 of the block groups in our unified and elementary district sample. We excluded those observations from our sample. As a result, our unified district sample consists of 16,729 block groups located within the boundaries of 305 unified districts, while our unified and elementary district sample consists of 24,349 block groups located within the boundaries of 819 elementary and unified districts. Means and standard deviations for the variables used in our analysis are reported in Table 1.

RESULTS

Regression results from the estimation of Equation [5] are reported in Table 2. All the models we estimate are weighted by the total number of voter’s in each block group. In addition all the standard errors reported in Table 2 are clustered at the metro area level to control for group-wise dependence and within-metro-area autocorrelation of the disturbance term, $\varepsilon_{it}$. Columns 1 and 2 report results based on the sample of unified districts, while columns 3 and 4 report results based on the sample that includes both unified and elementary districts. As hypothesized, support for Proposition 39 appears to be positively related to the degree of inter-district competition: in both sets of results the coefficient on the index of district competition is positive and statistically significant at the five-percent level.

The estimated coefficients on the block group level variables are also generally consistent with our expectations. For example, our results indicate that support for Proposition 39 is positively related to income and negatively related to the fraction of voters that are registered Republicans. Similarly, previous studies have found that renters and individuals with a college degree tend to have higher demand for public school spending, while families with children in private school tend to have lower demand for public school spending (e.g., Rubinfeld (1977), Bergstrom, Rubinfeld and Shapiro (1982), Rubinfeld and Shapiro (1989)). The results reported in Table 2 lead to a similar conclusion. The one exception is the coefficient on the tax price variable which is negative, but statistically insignificant in both sets of results. It should be noted, however, that the correlation between the block group and district level tax price variables is 0.92, suggesting that multicollinearity may explain the insignificance of both tax price variables in our results. To examine that possibility, we removed the district
level tax price variable and reestimated our model. In that case, the coefficient on tax price was negative and statistically significant at the five–percent level.

Recall that, all else equal, the theory outlined in the second section predicts support for Proposition 39 should be positively related to any variable that increases the desired level of spending of residents within a block group and negatively related to any variable that increases the desired level of spending of the new decisive voter within a district. Those predictions are generally supported by our results. For example, in both sets of results, support for Proposition 39 is positively related to the average income of voters within a block group, but negatively related to the income of the decisive voter within a district. Similarly, support for Proposition 39 is negatively related to the fraction of republicans within a block group, but positively related to the fraction of republicans within a district.

Our model also predicts that support for Proposition 39 should be negatively related to the reversion level of school spending, $S^0$. The results reported in Table

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### TABLE 1
MEANS AND STANDARD DEVIATIONS

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unified District Sample</th>
<th>Unified and Elementary District Sample</th>
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<tr>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
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<tr>
<td>Fraction “yes” on Prop. 39</td>
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<td>0.11</td>
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<td>Block Group Variables</td>
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<td>Average H.H. Income</td>
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<td>Average Tax Price</td>
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<td>0.011</td>
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<td>Fraction Republican Voters</td>
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<td>Fraction White</td>
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<td>Fraction College Degree</td>
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<td>0.20</td>
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<tr>
<td>Fraction No School–Age Children</td>
<td>0.64</td>
<td>0.15</td>
</tr>
<tr>
<td>Fraction Private School Children</td>
<td>0.15</td>
<td>0.16</td>
</tr>
<tr>
<td>Years in Current Residence</td>
<td>10.46</td>
<td>5.68</td>
</tr>
<tr>
<td>District Variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decisive Voter’s Income (45th Percentile)</td>
<td>45,379</td>
<td>15,026</td>
</tr>
<tr>
<td>Decisive Voter’s Tax Price (45th Percentile)</td>
<td>0.004</td>
<td>0.009</td>
</tr>
<tr>
<td>Enrollment</td>
<td>134,014</td>
<td>246,162</td>
</tr>
<tr>
<td>Fraction Republican Voters</td>
<td>0.34</td>
<td>0.13</td>
</tr>
<tr>
<td>Fraction White</td>
<td>0.52</td>
<td>0.20</td>
</tr>
<tr>
<td>Population Density</td>
<td>4,111</td>
<td>3,784</td>
</tr>
<tr>
<td>Urban</td>
<td>0.34</td>
<td>0.47</td>
</tr>
<tr>
<td>Enrollment Growth</td>
<td>0.10</td>
<td>0.10</td>
</tr>
<tr>
<td>Bond Revenue Per Pupil</td>
<td>253</td>
<td>295</td>
</tr>
<tr>
<td>Other Revenue Per Pupil</td>
<td>1,298</td>
<td>1,313</td>
</tr>
<tr>
<td>Years in Current Residence</td>
<td>10.40</td>
<td>2.61</td>
</tr>
<tr>
<td>Gini Index of Income Inequality</td>
<td>0.45</td>
<td>0.05</td>
</tr>
<tr>
<td>Block Group Fraction White * District Fraction Students Nonwhite</td>
<td>0.32</td>
<td>0.18</td>
</tr>
<tr>
<td>Metro Area Variables</td>
<td></td>
<td></td>
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<tr>
<td>Index of District Competition</td>
<td>0.86</td>
<td>0.09</td>
</tr>
<tr>
<td>Population</td>
<td>4,278,666</td>
<td>3,590,004</td>
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<tr>
<td>Population Density</td>
<td>1,434</td>
<td>1,125</td>
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<tr>
<td>Mean H.H. Income</td>
<td>65,362</td>
<td>11,714</td>
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<tr>
<td>Index of Racial Heterogeneity</td>
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<td>0.07</td>
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<tr>
<td>Gini Index of Income Inequality</td>
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<td>0.03</td>
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<tr>
<td>Number of Observations</td>
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<td></td>
</tr>
<tr>
<td>Number of Districts</td>
<td>305</td>
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</table>

Note: Means and standard deviations are weighted by the number of registered voters in each block group.
2 provide some evidence consistent with that prediction. Specifically, in both sets of results the coefficient on bond revenue per pupil is negative and statistically significant at the five–percent level, suggesting that voters located in districts that have already invested heavily in school infrastructure are less likely to support Proposition 39. In contrast, the coefficient on other revenue per pupil is statistically insignificant (and of the wrong sign). One possible explanation for these results is that voters are more aware of bond financed school infrastructure investment than they are of school infrastructure investment that is financed from other revenue sources. Specifically, since bond financed investment requires voter approval, voters may be better informed about past investments in school infrastructure that were financed with bond revenue than about past investments that were financed with other sources of revenue.
As noted previously, several studies have found that support for school spending tends to be lower when there is a mismatch between the race of voters and the race of school–age children. The results reported in Table 2 lead to a similar conclusion. In both sets of results, the coefficient on the interaction term between the fraction of white voters within a block group and the fraction of nonwhite students within a district is negative and statistically significant at the one–percent level. Thus, our results suggest that support among white voters for school spending declines as the fraction of nonwhite students in a district increases. Finally, in both sets of results the coefficient on the Gini index of district income inequality is positive and statistically significant, suggesting that support for Proposition 39 increases as the degree of income inequality within a district increases. That finding compliments the results of Corcoran and Evans (2004) who use a panel of 8,700 school districts from 1970 to 2000 to examine how increased income inequality within districts affects support for school spending. Similar to our results, they find that local spending per pupil is positively related to the degree of income inequality within districts.

Table 3 presents the predicted fraction of “yes” votes on Proposition 39 calculated using the coefficient estimates reported in column 1 of Table 2. The first row gives the predicted fraction of yes votes when all variables are held at their mean values. The second and third rows give the fraction of “yes” votes when all variables are held at their mean values except the degree of inter–district competition. The fraction of “yes” votes in the second row is for a block group with the mean characteristics except it is located in a metro area with no inter–district competition (index of district competition equal to zero). Similarly, the fraction of “yes” votes in the third row is for a block group with the mean characteristics except it is located in a metro area with significant inter–district competition (index of district competition equal to one). The fourth and fifth rows report the fraction of “yes” votes for a block group with mean characteristics except for the fraction of republican voters. The sixth row gives the fraction of “yes” votes for a block group with mean characteristics except the voters are all white and the block group is located in a district where only 25 percent of students are nonwhite.13 Similarly, the seventh row gives the fraction of “yes” votes for a block group with mean characteristics except the voters are all white and the block group is located in a district where 90 percent of students are nonwhite.14

The second and third rows of Table 3 reveal that inter–district competition has a sizeable effect on the fraction of “yes” votes. Moving from an area with little or

<table>
<thead>
<tr>
<th>Value of Independent Variables</th>
<th>Predicted Fraction of “Yes” Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.55</td>
</tr>
<tr>
<td>Mean Except:</td>
<td></td>
</tr>
<tr>
<td>Index of District Competition = 0</td>
<td>0.44</td>
</tr>
<tr>
<td>Index of District Competition = 1</td>
<td>0.57</td>
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<tr>
<td>Block Group Fraction Republican = 0</td>
<td>0.74</td>
</tr>
<tr>
<td>Block Group Fraction Republican = 1</td>
<td>0.19</td>
</tr>
<tr>
<td>Block Group Fraction White =1 and District Fraction Students Nonwhite = 0.25</td>
<td>0.59</td>
</tr>
<tr>
<td>Block Group Fraction White =1 and District Fraction Students Nonwhite = 0.90</td>
<td>0.44</td>
</tr>
</tbody>
</table>

13 25 percent nonwhite corresponds to the 10th percentile of nonwhite students in the sample.
14 90 percent nonwhite corresponds to the 90th percentile of nonwhite students in the sample.
no inter–district competition to an area with significant inter–district competition generates a 13 percentage point increase in support for Proposition 39 (from 0.44 to 0.57). Political ideology also has a large effect. In block groups with no registered Republican voters, the predicted fraction of “yes” votes is 0.74. In contrast, in block groups where 100 percent of voters are registered Republicans, the predicted fraction of “yes” votes is only 0.19. The extent to which the race of students within a district diverges from the race of voters within a block group also has a relatively large effect on support for Proposition 39. In a block group where all the voters are white and only 25 percent of students are nonwhite, the predicted fraction of “yes” votes is 0.59. In contrast, a block group where all the voters are white, but 90 percent of students are nonwhite, the predicted fraction of “yes” votes is only 0.44.

CONCLUSION

When budget–maximizing behavior on the part of local government leads to tax and expenditure outcomes that deviate from the desires of local voters, voters have an incentive to impose constraints on government behavior. Conversely, if local governments remain unresponsive to the desires of local voters, voters have an incentive to maintain policies, such as super–majority vote requirements, that limit their behavior. Perhaps that explains why voter support for two recent initiatives in California, designed to make it easier for local school boards to raise taxes and increase school spending, received far lower support than predicted by the traditional decisive voter model. In particular, Propositions 26 and 39 would have reduced the vote requirement for passage of school bond measures from two–thirds to either a simple majority or 0.55. If local school boards were responsive to the desires of the decisive voter, Proposition 26 should have received at least 50 percent of the popular vote, while Proposition 39 should have received at least 55 percent. In this paper, we have argued that budget–maximizing behavior on the part of local school boards may be one reason why support for those initiatives was lower than the traditional decisive voter model would have predicted.

To examine whether the weaker–than–expected support for Proposition 39 was related to budget–maximizing behavior on the part of local school boards, we examined the relationship between vote outcomes on Proposition 39 and the degree of inter–jurisdictional competition. Numerous studies have shown that competition tends to limit the self–aggrandizing behavior of the local government. Thus, we hypothesized that support for Proposition 39 should be positively related to the degree of inter–district competition. Our empirical results are consistent with that hypothesis: vote outcomes on Proposition 39 were found to be positively related to the degree of inter–district competition. Moving from a metro area with little or no competition to one with significant competition leads to a 13 percentage point increase in support for Proposition 39.

On a final note, our finding that vote outcomes on Proposition 39 are related to the degree of inter–jurisdictional competition may shed light on a much broader question: namely, why have property tax limitation measures such as Proposition 13 and Proposition 2 ½ never been overturned? If local governments were responsive to the desires of local voters, property tax limitation measures would appear unnecessary. That point was recently made by McGuire (1999) in her analysis of the effects of property tax limitation measures. As she notes, if the decisive voter model was operational, “then limits will have no effect because local voters will override binding limits
when they result in undesirable changes in revenues and expenditures.” Our findings suggest that local governments may not be responsive to desires of local voters, particularly if they face little competition from neighboring jurisdictions. Perhaps that explains why Proposition 13 and its offspring continue to receive broad-based support.

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