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Why Do School District Budget Referenda Fail?

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Our article analyzes historical data for New York State on the percentage of school board budget proposals that are defeated each year and panel data that we have collected on budget vote success for individual school districts in the state. We find that changes in state aid have little impact on budget vote success. Defeating a budget in one year increases the likelihood that voters will defeat a budget the next year. Finally, districts have a lower probability of having their budget proposals defeated when their school board members have longer terms.

Keywords: *budget referenda, school district finance*

I. Introduction

Public elementary and secondary education is financed at least partially in many states at the local level and school district budgets in many states are determined by voter referenda. To date, however, no studies have sought to explain why the proportion of school district budget referenda in a state that are approved by voters varies over time. Similarly no research has used panel data on school districts to test, whether budget referenda failures are concentrated in a small number of school districts within a state, why the probability of budget referenda failure varies across school districts at a point in time, and whether the failure of a budget referendum in a school district in one year influences the likelihood that voters in the district will reject a proposed budget in the next year. Our article uses data from school budget votes in New York State to answer these questions. The answers may help school boards seeking to avert budget referenda defeats to frame their initial budget proposals and to change how their boards are structured.

We begin by presenting background information on the school budget process in New York State and describe what prior research has taught us about budget referenda. Section III presents

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historical data on the percentage of school budget proposals in New York State that have been defeated each year and estimates models of the determinants of this percentage. A key variable proves to be the growth rate of real income in the state, while the effects of changes in state aid to education are small.

If the pass rate in a year is 80% then voters in four fifths of the districts have approved budgets and in one fifth have defeated budgets. This leads us to question why the probability of budget passage varies across districts in a given year and to ask whether budget failures are concentrated among a relatively small number of districts. To answer these questions requires data on the results of budget referenda for individual districts for a large number of years. In section IV we describe a survey that we undertook of New York State school districts to obtain district-level panel data. The frequency of budget rejections over a twenty-three year period is shown to vary widely across districts, with a substantial fraction always having passed their budgets.

In section V, we estimate models of whether a school district's budget proposal is defeated by the voters in a year. Our initial focus is on characteristics of the school district and the school board, as well as financial variables, including changes in state aid. The percentage changes in state aid per student in any given year vary widely across school districts and the correlation across districts in the percentage change in any two adjacent years is quite low.[1] This permits us to test whether the probability that a budget proposal is defeated increases when state aid to a school district is increasing at a slower percentage rate than the average percentage increase in the state in the year.

The panel data also allow us to ascertain if districts in which voters have defeated budgets in the recent past are more likely than other districts to see their referenda defeated in the current year. The answer proves to be yes and we distinguish between the hypothesis that this relationship reflects that voting down a budget in one year makes it more likely that the budget will be voted down in the next year (state dependence) and the hypothesis that variables omitted from our models simultaneously cause a district's voters to vote down the budget proposed by the school board in two adjacent years (heterogeneity). Finally, we provide some brief concluding remarks.

II. The School Budget Process in New York State and Previous Research on Budget Referenda

Public elementary and secondary education is financed in New York State primarily through a combination of state aid and local school district revenues. In 1999–2000, the former provided about 44% of total school district expenditures and the latter 52%, with the balance of funds coming from the federal government. The primary source of local school district revenues, approximately 90% statewide, is property tax revenue generated from a tax on residential and commercial property in each district.

Each spring, on a designated date, voters in the vast majority of each of the almost 700 local school districts in the state vote on a budget that has been proposed by their local school district's board of education. Given estimates of expected state aid to the district, its other sources of revenue, and the value of property in the district, the budget determines the tax rate that will be levied to support the school district during the forthcoming academic year. The voters also elect a fraction of the local school board members at the same time that the budget vote takes place.

In the event that the budget is defeated, a school board faces a decision. It can adopt a *contingency* budget that is mandated by state law and that restricts the district's spending in the next year to exceed no more than a specified percentage of its spending in the current year. Alternatively, the school board can resubmit the budget that was defeated or submit an alternative, usually smaller, budget, to the voters for their consideration. If the budget fails on the second vote, the district must then adopt a contingency budget. Doing so is rarely in a school district's best long-term interest because the contingency budget then becomes the base upon which the following year's budget proposal is built. Having spending severely restricted in one year makes it difficult to both restore cut programs and to provide for inflationary increases in the next year's budget.

A number of school districts in New York State adopt their budgets without budget referenda. School districts that are located in the five largest cities in the state, Buffalo, New York City, Rochester, Syracuse, and Yonkers have their budgets determined by their school boards. The 57 small city school districts, districts that have

boundaries that coincide with city lines and are located in cities with populations of less than 125,000, have had their districts' voters vote on the districts' school budgets only since legislation permitting them to do so was passed in 1997. However, for the vast majority of school districts in the state, over 630 in the early 1990s and then over 680 in the late 1990s, annual school budget referenda were the method used by school districts to determine their budgets.[2]

A number of researchers have addressed how individual voters voted on specific budget referenda or tax limitation proposals.[3] Their focus has been on the characteristics of individual voters and the implicit "tax price" that each voter faced. Other researchers have analyzed school district-level data. For example, Romer, Rosenthal, and Munley (1992) estimated a structural model of voting on school budget referenda in New York State using district-level data for a single year in the 1970s. They found that boards in small school districts were more likely to act as if they represented the interests of median voters in the district, but that boards in larger districts were more likely to act as if they were trying to maximize their budgets.[4] Rothstein (1994), using district-level school budget referenda data for Michigan school districts in 1981, also found support for budget maximizing behavior of boards. Finally, Feld and Grossman (1984) analyzed data for a sample of Long Island (NY) school districts during the 1970s and found that the size of a school district's budget increase proposal in a year was positively related to the share of the district's residents that had voted for the district's budget proposal in the previous year, while the share of a district's voters voting for a proposal in a year was negatively related to the size of the district's budget proposal.

III. Historical Data on New York State School District Budget Referenda

Table 1 presents annual data for the 1969 to 1999 period on the number of school districts in New York State that held budget votes, the number of these budgets that were passed by the voters and thus the percentage of school district budgets that were adopted by the voters. The number of districts that held budget votes declined gradually from 690 in 1969 to 628 in 1996 reflecting the gradual consolidation of small districts into larger ones within New York State. The increase to 685 in 1997 reflects the passage of the state law that allowed small city districts to submit their budgets to the voters. The fraction of districts in which voters adopted proposed budgets fluctuated over time ranging from lows of under 70% in 1978 and 1994 to highs of over 90% in 1984, 1998 and 1999.

What determines the fraction of school districts whose voters pass their budgets each year? Financial variables surely matter. If state aid per student is increasing in real terms, any given size school board budget proposal will require a smaller increase in the school district property tax and thus should be more likely to win voter support.[5] Similarly, the more rapidly per capita real state income is increasing in the state; the more likely voters will be to accept any given size proposed school budget and tax rate increase. Public school enrollments also presumably matter; growing enrollments mean more families with children in the schools and thus a greater base of support. However, the greater the fraction of school age children in the state educated in private schools, the smaller the share of tax payers who are likely to support school budget increases.

Poterba (1997) and Ladd and Murray (2001) found that an increase in the fraction of elderly voters was associated with no change or a reduction in educational spending per student, however when the elderly and the school age population came from different racial groups, both found that an increase in the fraction of elderly voters was associated with lower educational spending per student. To the extent that school boards factor in the preferences that the elderly may have for less school spending into their budget proposals, it is unclear what the effect of the proportion of the population that is elderly will be on budget vote success. Finally if voters newly voting in small city school districts display different behavior than voters in districts where budget voting on the has been a long tradition, one would have to control for the introduction of the small city voting in the analysis.

Table 2 presents estimates of equations that seek to explain the time series variation in the fraction of school district budget referenda that pass in New York State. Because the budget pass rate in the state (p) can vary only between 0 and 1, the dependent variable in these models is the logarithm of the odds ratio [log ($p/(1-p)$)], a transformation that permits the error term to be normally distributed.

TABLE 1
Historical Budget Vote Data in New York State

Year	Budgets Adopted	Budget Votes	Percent Adopted
1969	553	690	80.1
1970	596	678	87.9
1971	547	679	80.6
1972	569	672	84.7
1973	548	673	81.4
1974	568	667	85.2
1975	509	665	76.5
1976	469	661	71.0
1977	511	659	77.5
1978	436	658	66.3
1979	567	659	86.0
1980	464	656	70.7
1981	507	655	77.4
1982	544	655	83.1
1983	571	654	87.3
1984	586	651	90.0
1985	579	651	88.9
1986	573	649	88.3
1987	567	644	88.0
1988	552	644	85.7
1989	507	642	78.1
1990	492	641	76.8
1991	459	640	71.7
1992	510	638	79.9
1993	460	637	72.2
1994	437	637	68.6
1995	494	633	78.0
1996	533	628	84.8
1997	593	685	86.5
1998	639	683	93.6
1999	633	683	92.7

Note. Data for 1997–1999 include small city school districts voting for the first time.
Source: New York State Department of Education Office of Educational Management Services available online at http://www.emsc.nysed.gov/mgtserv/bvhist.htm.

Recalling that the school district budget vote occurs in the spring of each year for the following school year, the estimates in the first column come from a specification that assumes a type of rational expectations on the part of voters. For example, for the vote that takes place in the spring of 1990, this specification assume that the voters can accurately predict what their district's real state aid per student will be in 1990–91 and thus that they act as if they know the actual percentage increase in real state aid per student that will occur between 1989–90 and 1990–91. This would enable them to estimate what their tax rate increase would be, given the proposed budget and knowledge of the value of property in the district. Similarly, since the 1990–1991 school year encompasses parts of both 1990 and 1991, it assumes that they generate their expectations about their ability to pay for school tax increases based upon their accurately estimating the growth of real per capita income in the state between the two years. Finally, it assumes that they act as if they know what the increase in school enrollments will be in the 1990–91 school year as compared to the 1989–90 school year.

The estimated coefficients in this column are disappointing. The only coefficient that is even close to being statistically significantly different from zero is that for the years that city school districts voted on school budgets; the pass rate was

TABLE 2
Budget Pass Rate Equations: 1970–1998[a]

	Equation 1		Equation 2		Equation 3	
Variable	Coefficient	t[b]	Coefficient	t	Coefficient	t
ENR ($t-1, t$)			4.930	1.46	4.175	1.10
AID ($t-1, t$)			3.477	1.84	3.615	1.86
INC ($t-1, t$)			8.153	2.20	8.165	2.16
ENR ($t, t+1$)	−2.070	0.51				
AID ($t, t+1$)	0.873	0.40				
INC ($t, t+1$)	0.916	0.18				
AGE 65 (t)	15.644	0.34	−8.802	0.17	−20.331	0.34
PRIV (t)	−7.290	0.44	−17.695	−0.98	−21.196	1.07
CITY	0.928	2.25	0.836	2.26	0.715	1.59
LAG ($t-1$)					0.130	0.49
n		29		28		28
Adj. R2		0.27		0.47		0.45

Notes.
[a]Budget vote is in the spring of year t for school year ($t, t+1$). Also included in each equation are an intercept term and a dichotomous variable for nonreporting of private school enrollments
[b]Absolute value of t statistic
ENR = percentage change in public school enrollments in the state
AID = percentage change in per capita real state school aid in the state
INC = percentage change in real income in the state (calendar years)
AGE 65 = fraction of the state's population that is age 65 and older
PRIV = fraction of school children enrolled in private schools
CITY = 1 = small city districts vote on school budgets, 0 = city districts not vote
LAG = Log Odds of Budget Pass Rate in the previous spring

higher in these years. However, before one takes these results too seriously, we must note that the governor and state legislature in New York State have long been unable to come to agreement on the state budget by the start of the New York State fiscal year (April 1).[6] Thus, the actual aid that a school district will receive during the next academic year is unknown at the time of the budget vote. While a school board usually makes an estimate of the state aid increase when proposing a budget, which leads to an implicit or explicit proposed tax increase, voters may not have the same estimate in mind and may form their expectations in a different manner. One simple alternative, for example, is for them to assume that the real percentage increase in state aid per student in the upcoming year will be the same as the district received in the current year.

Returning to our example, school district voters' votes in the spring of 1990 for the 1990–91 school budget may depend upon the percentage increase in real state aid per student that occurred between 1988–89 and 1989–90, not the actual increase that will occur between 1989–90 and 1990–91. Similarly, the percentage increase in enrollment that the voters project to occur may be the percentage increase that occurred in the current academic year, not the actual realization in the next year. Finally, the voters' willingness to support public schools may be based upon the actual percentage increase in real income that they experienced between the 1989 and 1990 calendar years, not the percentage increase that will occur between 1990 and 1991.

Column 2 of table 2 presents estimates of the log odds model when these alternative financial and enrollment change variables are used. The fit of the model is much better. The percentage change in real income in the state is significantly positively related to the log odds of the budget pass rate at the .05 level of significance and the percentage change in per capita state aid is significantly related at the .10 level of significance. Evaluated at the 1998 levels of all of the explanatory variables, a one-percentage point increase in real state aid per student between the current and previous school year is seen to increase the budget pass rate by about .30 percentage points. Similarly, a one-percentage point increase in the rate of real income growth that took place between

the current and previous calendar year is associated with a .69 percentage point increase in the pass rate.[7] Neither the percentage change in school enrollment in the state, the fraction of the population that is age 65 or older, nor the fraction of students attending private school in the state influence the aggregate pass rate in the state.[8]

In column 3, we estimate a variant of the model that includes the log odds of the budget pass rate in the previous spring as an additional explanatory variable. That is, we ask if the fraction of districts that pass a budget in one year influences the fraction that pass it the next year, holding all other variables constant. The coefficient of the lagged dependent variable is small and statistically insignificantly different from zero, suggesting that at the state level, the proportion of budget referenda defeated in one year does *not* influence the proportion of budget vote referenda defeated in the next year. Moreover, the magnitude and statistical significance of the percentage change in real state aid per student remain about the same as before. Use of an instrument for the lagged dependent variable, to control for the possibility of autocorrelation in this model with a lagged dependent variable, yielded virtually identical results.

One final extension warrants being briefly mentioned here. At the suggestion of a referee we attempted to test whether the political election cycle influences school district voter's expectations about the magnitudes of state aid that their district might receive. Gubernatorial elections are held in New York State every four years and legislative elections are held every two years. Other factors held constant, one might expect that the political process will "deliver" greater increases in school aid in election years and thus that school district voters will be more likely to vote for proposed school budgets in these years. However, when we included two dichotomous variables in our analyses to capture whether the budget referenda occurred in the spring of gubernatorial or legislative election years, the estimated coefficients of these variables' never proved to be statistically significantly different from zero.[9]

IV. Individual School District Data

Although the New York State Education Department's Office of Enrollment Management Services maintains records of the fraction of school districts in which voters passed school budgets annually going back to 1969, it discards the results of individual school district's vote passage history after five to six years. Currently, only the individual school district vote passage records for the votes taken during the 1998–99 to 2003–04 school years are available from it.[10]

To obtain historical data, the Survey Research Institute at Cornell University surveyed all school districts in New York State (excluding New York City) during the summer and fall of 2001. The survey requested information for the 1975 to 1997 period on the results of the initial budget referendum each year, if the initial proposed budget was defeated whether a second budget was submitted to the voters and, if a second budget was submitted, whether that budget passed. The survey also requested information on the number of members on the school board and the length of their terms.

Of the 699 districts surveyed, six proved to be special districts in which school budget votes do not take place, 32 refused to participate and 137 did not reply to repeated requests. We received usable responses from 499 districts for the budget votes undertaken in the spring of 1997, which represented about 75% of all the New York State local school districts that held budget votes that spring. The number of years that districts provided voting histories to us varied and the number of reporters declined as we went further back in time. For the earliest year for which we requested data in our survey, 1975, there were 328 respondents, which represented about 49% of the total budget votes in that year (Table 1).

Table 3 provides information for each year on the number of school districts that reported their budget votes to us, the percentage of the sample districts whose budgets were adopted by the voters on the first vote, the percentage of the sample district whose voters ultimately approved a budget, and the actual aggregate percentage of districts in the state whose districts approved budgets. The percentage of districts in our sample whose budgets were ultimately approved by the voters in 1997 exceeds the percentage of all districts in the state whose voters approved budgets that year by almost 10 percentage points, which indicates that districts that refused to participate in our survey, or that did not respond to the survey, were more likely to be districts whose voters had rejected the budget proposal in that year. As one goes further back in time, the divergence

TABLE 3

Initial Pass Rate, Final Pass Rate, and Their Correlation with the Published Pass Rate for the Current Year Sample

Year	Sample	Initial Pass	Final Pass	Published Pass
1975	328	86.28%	93.60%	76.50%
1976	326	81.90%	92.94%	71.00%
1977	339	84.96%	94.40%	77.50%
1978	343	75.51%	87.76%	66.30%
1979	350	92.57%	97.14%	86.00%
1980	370	81.08%	91.62%	70.70%
1981	373	84.99%	93.57%	77.40%
1982	386	88.86%	96.37%	83.10%
1983	390	89.23%	94.87%	87.30%
1984	398	89.95%	97.74%	90.00%
1985	411	91.00%	96.11%	88.90%
1986	419	90.93%	96.66%	88.30%
1987	426	88.03%	94.60%	88.00%
1988	431	88.40%	94.66%	85.70%
1989	432	83.56%	95.37%	78.10%
1990	445	80.67%	91.91%	76.80%
1991	446	79.37%	87.22%	71.70%
1992	448	81.03%	92.41%	79.90%
1993	448	78.35%	91.52%	72.20%
1994	458	76.20%	89.08%	68.60%
1995	458	84.50%	90.83%	78.00%
1996	473	89.22%	94.29%	84.80%
1997	499	89.98%	95.19%	86.50%
Average		85.07%	93.47%	79.46%

	Initial pass	Final pass	Published pass
Initial pass	1.000	0.887	0.926
Final pass	0.887	1.000	0.843
Published pass	0.926	0.843	1.000

between the pass rate among districts in our survey that provided information and the aggregate pass rate for all districts in the state tends to get larger. However, as the bottom panel of Table 3 indicates the correlations over time between the published pass rate data found in Table 1 and the initial and final pass rates for our samples of reporting districts, .926 and .843 respectively, are quite high.

There were 294 districts in our sample that provide information on whether voters approved the budgets in their districts for each year between 1975 and 1997. The average pass rates for these districts, both initially and finally, are slightly higher than the average pass rates found in Table 3. The correlation of the pass rates for these districts with the reported published pass rate is very similar to those found in Table 3 (see Ehrenberg, Ehrenberg, Smith, & Zhang, 2003.)

Do budget pass rates vary systematically across school districts? Table 4 tabulates the number of times each of the 294 school districts that were in our sample each year saw their budget proposals defeated during the 23 year period for which we collected data. Fifty-six of the districts, or 19%, always had the voters approve their budget on the initial vote. One hundred and fifty four of the districts, or 52%, always had a budget proposal ultimately approved by the voters and thus never adopted a contingency budget.

The number of times that voters defeated school budget proposals in other districts varies across districts from 1 to 12 times during the 23 year period. The norm is budget passage and as the number of budget defeats increases, the number of districts steadily decreases. On average, districts in our sample saw their initial budget proposals defeated 13% of the time and went to

TABLE 4
Number of Budget Defeats by School District in the Sample

Number of Failures	Initial Vote	Final Vote
0	56	154
1	56	49
2	47	38
3	39	15
4	19	15
5	27	12
6	10	4
7	12	3
8	10	1
9	4	2
10	4	0
11	3	0
12	7	1
Average fail rate	.132	.055

Note. Authors' computations from the sample of 294 school districts that reported data for all 23 years. The second round failure rate, conditional on failing in the first round was .42.

contingency budgets 5.5 percent of the time. For those districts that held second votes on the same or a revised budget, the probability of passage the second time was about 58%.

V. Why Do Budget Referendum Failures Vary Across School Districts

The availability of data in electronic form on the characteristics of school districts and their finances in New York State back to the 1984–85 school year, along with the data on voting outcomes that we have collected, allow us to analyze data for a panel of 380 districts that span the 1985–86 to 1996–1997 school years.[11] All of the small city districts, which first began to vote on school budgets in the 1996–97 year, are omitted from our sample.

The previous section suggests that this sample is not a random sample of the districts that voted on school budgets in New York during the period. While there are methods available to control for selection bias (see for example Heckman 1979), in the absence of having data for a set of variables that might be expected to influence whether a district appears in our sample but that do not influence the voting outcomes given that the district appears, identification using such methods would be achieved only by arbitrary functional form assumptions.[12] As such, we have chosen not to pursue such approaches and caution that the results that follow may be subject to selection bias.[13]

Table 5 presents estimates of the marginal effects of each explanatory variable on the probability that a school district's budget proposal is defeated on the initial vote in a year that we obtained from Probit models. The coefficient of each variable represents an estimate of the effect of a one-unit change in the underlying variable on the percentage change in the probability that a proposed budget will be defeated.

In evaluating the results that follow, readers should keep in mind that we do not have information on the initial budget increases that were proposed for each district each year. Many of the variables included in our model should also be expected to influence school boards' budget proposals. Absent information on the size of the proposed budget increase, which presumably would be a key variable in a structural model of whether a proposed budget was defeated, one should interpret the estimates that follow as coming from a reduced form model.

Estimates of four models are presented in this table. A baseline model (Column 1) focuses on the impact of district level variables that either are constant or vary over time. The next model (Column 2) seeks to ascertain whether the estimated effects of these variables changes when year specific effects are included, to control for unobservable (to researchers) factors that vary over time, but not across districts, that may influence budget vote success. We next estimate a random effects model (Column 3) to see whether

TABLE 5

Initial Fail Rate Equations: Probit Models, Marginal Effects (Absolute value t statistics)

Variable	(1)	(2)	(3)	(4)
SUBURB	4.3104 (2.9)	3.8988 (2.7)	3.3191 (1.8)	3.0567 (1.8)
LESS 18	–0.5208 (1.5)	–0.2795 (0.8)	–0.2765 (0.6)	–0.1869 (0.5)
MORE 65	–0.8139 (2.5)	–0.8053 (2.5)	–0.7472 (1.8)	–0.7281 (1.9)
BLACK	–0.1174 (1.5)	–0.0920 (1.2)	0.3798 (0.8)	0.3471 (0.7)
HISP	0.1740 (0.8)	0.2117 (1.0)	0.4822 (0.8)	0.4468 (0.7)
OTHER	0.0500 (0.2)	–0.0142 (0.1)	–0.2332 (0.3)	–0.1857 (0.3)
FLUNCH	0.0305 (0.6)	–0.1022 (1.5)	0.1238 (1.2)	0.1038 (1.0)
LEP	0.0285 (0.0)	–0.0019 (0.0)	0.2492 (0.3)	0.2242 (0.2)
POVERT	–0.2470 (2.0)	–0.1288 (1.0)	–0.0973 (0.5)	–0.0810 (0.4)
PUPMOB	0.5077 (1.3)	0.5821 (1.4)	0.4591 (1.1)	0.4246 (1.0)
PRIVSCH	0.3763 (4.1)	0.3716 (4.0)	0.3697 (3.1)	0.3164 (2.9)
INCOME	–0.0473 (0.6)	–0.0875 (1.0)	–0.1273 (1.1)	–0.1083 (1.0)
COLLED	–0.4555 (6.0)	–0.4707 (6.3)	–0.4611 (4.9)	–0.4347 (5.0)
BOARDT	–3.1596 (4.9)	–3.0774 (4.8)	–2.5605 (3.2)	–2.2411 (3.0)
BOARDS	0.6796 (4.0)	0.6714 (4.0)	0.2521 (0.2)	0.4549 (0.3)
PCTINC	–1.6673 (6.4)	–0.7981 (2.0)	–0.6819 (1.8)	–0.7688 (2.0)
PCTVAL	0.0202 (0.4)	0.0050 (0.1)	0.0050 (0.1)	0.0026 (0.0)
PCTAIDS	–0.0043 (0.6)	–0.0041 (0.5)	–0.0046 (0.5)	–0.0045 (0.5)
LFAIL				7.7577 (5.7)
N	4560	4560	4560	4560
χ^2	210	236	184	250
Year Fixed Effects	no	yes	yes	yes
Dist. Random Effects	no	no	yes	yes

Notes. All coefficients show the impact of one-unit changes in the explanatory variables on the percentage of times an initial budget vote will be defeated.

SUBURB 1 = suburban district, 0 = rural district.

LESS 18 = Percent population 5–17 (interpolated between census years).

MORE 65 = Percent population at least age 65 (interpolated between census years)

BLACK = Percent district students that are Black.

HISP = Percent district students that are Hispanic.

OTHER = Percent district students that are American Indian, Alaska Native and Asian and Pacific Islanders.

FLUNCH = Percent district students receiving free or reduced price lunches.

POVERT = Percent children age 5–17 in the district from families below the poverty line.

LEP = Percent district students with limited English proficiency.

PUPMOB = Pupil mobility index.

PRIVSCH = Percent of students residing in the district who attend private schools in 1990.

INCOME = Per capita real income in the school district in 1990.

COLLED = Percentage of adults in the district with at least a bachelor's degree.

BOARDT = Length of school board members' terms.

BOARDS = Number of students in the district/size of the school board (in hundreds).

PCTINC = Percent change in real per capita income in the county.

PCTVAL = Percent change in real assessed value of property in the district.

PCTAID = Percent change in real state aid per student in the district multiplied by the share of state aid in the school district's revenue.

LFAIL = District voters rejected the budget on the first vote last year, 0 = no.

the inclusion of district level unobservable (to researchers) factors that may influence budget vote success influence the estimates of the coefficients of observable district level variables. Finally, we estimate a dynamic model (Column 4) that tests whether voter rejection of a budget proposal in a district in one year, increases or decreases the likelihood that the district's budget proposal will be defeated in the next year.

Turning first to the baseline model, suburban districts (SUBURB) are about four percentage points more likely to defeat initial school budget proposals than their rural counterparts. Suburban districts tend to be larger and previous research

suggests that school board members in larger districts are more likely to have an objective of maximizing their districts' budgets, while school board members in smaller districts are more likely to behave as if they represented the median voter (see Romer, Rosenthal and Munley 1992 and Romer and Rosenthal 1982). We find that the higher the proportion of residents in a county that are above age 65 (MORE65), the less likely that school districts in the county see their initial budget proposals defeated. This may reflect either that school districts in counties in which there are high proportions of older votes moderate their budget proposals to avoid risking defeat or that older residents, many of whom have grandchildren, retain a strong concern about the quality of public education in their areas.

Neither the racial/ethnic distribution of a district's population (BLACK, HISP), the extent of pupil mobility in and out of the district (PUPMOB), the percentage of a district's students that are of limited English proficiency (LEP), the proportion of students in the district receiving free or reduced price lunch (FLUNCH), nor the mean income in the community in 1990 (INCOME) appear to significantly influence the probability of budget defeat in these data. Districts in which a greater percentage of the adults have at least a college education (COLLED) and in which a greater percentage have incomes below the poverty line (POVERTY) are less likely than other districts to suffer budget defeats. In contrast, the greater the percentage of students in the district that attend private schools (PRIVSCH), the higher the budget vote failure rate is.

School districts vary in New York State in terms of the size of their school boards and the length of their school board members' terms. Almost 50% of the districts in this sample have 7 board members, another 49% have either 5 or 9 members, and a small number of districts have 3, 6, or 8 members. About 64% of the districts in this sample have 3-year terms for their members, 35% have 5-year terms and the remaining districts' board members have 4-year terms.

The greater the number of years that school board members serve (BOARDT), the lower the probability that a budget will be defeated. Moving from 3 to 5-year terms for example, is associated, other factors held constant, with about a 6-percentage point reduction in the likelihood that a budget will be defeated. Apparently longer terms for school board members are associated with more stability on the board and thus a board that is more likely to understand the concerns of voters when framing the budget.[14]

Interestingly, the greater the number of students per school board member, the more likely budgets will be defeated (BOARDS). The mean number of students (in hundreds) in a district per school board member in our sample is 3.24 and its standard deviation is 3.27. An increase, for example, in 100 students per school board member, is associated with an increase of .68 percentage points in the likelihood that a vote will be defeated. This implies that the higher the number of students per school board member is, the less likely it is that the board will be representative of the community. The number of students per school board member is very highly correlated with the size of the school district so this variable may also simply be capturing school district size. In any case, this variable ceases to be important when we estimate more comprehensive models below.

The remaining three explanatory variables reflect changes in economic conditions. A greater increase in real income per capita in the county in which the school district is located is associated with lower initial vote failure rates; each percentage point increase in real per capita income reduces the failure rate by about 1.7 percentage points. Increases in real state aid appear to be unimportant, as each percentage point increase in real state aid multiplied by the share of the district's budget that state aid initially represents reduces the initial failure rate by only 0.004 percentage points.[15] Finally, changes in the real value of property in the district are also not associated with the failure rate, as school boards apparently take these changes fully into account when framing initial budget proposals.

Column (2) reports the coefficients the model that also includes year fixed effects. The magnitudes and statistical significance of most coefficients in this model are identical to the results reported in the previous column. However, the magnitude of the marginal effect of the percentage change in real income variable falls by roughly one half.

In Column (3), we added district-level unobservable effects that are permissibly correlated with the other explanatory variables in the model to control for unobservable district-level factors that may influence budget vote success.

Such effects are typically modeled as either being fixed or random. Because of the computational difficulty of estimating a dynamic Probit model with fixed effect (we will estimate a dynamic Probit model shortly), we treat these district-level effects as being random.[16] The inclusion of these random effects leaves most of the coefficients of the explanatory variables unchanged. However, the estimated marginal impact of changes in per capita income is slightly smaller. Furthermore, the number of students per board member and the percent of the adults in the district with incomes below the poverty line are no longer statistically significantly related to the probability of the initial budget proposal being defeated.

Finally in Column (4) we estimate our preferred model that includes year fixed effects and district random effects that may be correlated with the other explanatory variables and also allows for the possibility that failing to pass a budget on the initial vote in one year leads to a higher or lower probability of failing to pass a budget on the initial vote in the next year. That is, we test whether budget defeats have a *narcotic effect,* in the sense that a budget defeat in a district on the initial vote in one year, increases the likelihood that the budget will again be defeated on the initial vote in the district in the next year, or whether such a defeat encourages the school board and the voters to work harder to pass the budget the next time.[17]

Simply including whether a budget referendum was defeated in the previous year on the right-hand side of the estimating equation does not permit one to distinguish between the hypothesis that budget defeats in one year influence the likelihood of budget defeats in the next year (*state dependence*) and the hypothesis that there are some variables that have been omitted from the analyses that vary across districts, are relatively constant within each district over time and influence the probability of a budget being defeated (*heterogeneity*), see Heckman (1978) and Heckman and Borjas (1980). Such omitted variables, which influence the outcome of a budget vote in one year, will also influence the outcome in the next year and thus will bias the coefficient of the lagged budget vote variable in a positive direction.

Fortunately, methods have recently been developed to estimate dynamic Probit models that include lagged dependent variables that take account of such omitted variables and we employ such methods.[18] The estimated marginal effects of those explanatory variables included in the previous models are virtual identical to those found in Column (3). Crucially, the marginal effect of the lagged dependent variable in this model is positive and statistically significantly different from zero. Other factors, held constant, the estimate implies that defeat a budget referendum in one year increases the probability that this will occur in the next year by about 7.8 percentage points. Thus, budget referendum defeats do have a *narcotic effect,* in the sense that they increase the chance that a district's voters will defeat the budget proposal in the subsequent year.[19]

We conducted similar analyses in which the dependent variable was a dichotomous variable that took on the value of one if voters in a district rejected an initial budget proposal put forth by a school board and then the school board either went directly to a contingency budget or went to a contingency budget after a second budget proposal was defeated and took on the value of zero if a budget proposed by the school board was accepted by the voters either on an initial or second vote. Although these analyses attempted to "explain" a very rare event (on average only 5.5% of our sample districts adopted contingency budgets each year), the results were very similar to those reported in Table 5.[20] Adopting a contingency budget in one year was seen to increase the probability that a district will adopt a contingency budget in the next year by about 4.2 percentage points. Similarly, districts in which board members had five-year terms rather than three-year terms were about two percentage points less likely to adopt contingency budgets, other factors held constant.[21]

VI. Conclusion

Our analyses of the aggregate pass rate data on budget referenda in New York State, as well as the panel data on school district budget votes, have yielded a number of important findings.[22] Changes in real income statewide are positively associated with the proportion of school districts whose budgets pass in a year and changes in real income at the local level are positively associated with the probability that an individual district will pass its budget. Per capita percentage changes in state aid received by a school district do not appear to affect the probability that voters will pass the district's budget proposal. Voting down a

budget in one year increases the likelihood of voters rejecting the budget in the next year and this provides an extra incentive for school boards to try to avoid budget vote defeats.

Perhaps our most important finding is that the length of terms of school board member is an important predictor of budget vote passage. Other factors held constant, voters in school districts whose board members have longer terms have a lower probability of rejecting budget proposals. Having board members with longer (but staggered) terms appears to increases the likelihood that the board is "tuned" into the preferences of voters.

The public choice literature suggests the importance of trying to "endogenize" the median voter to increase the chance of passage of proposed budgets see Fort and Bunn (1998). For example, if votes on school budgets took place at the same time as the general election, many people who turn out to vote would not necessarily be people who highly value public education. Thus a school board seeking to achieve passage of its budget would be forced to propose a smaller budget than it would be able to do if these voters did not turn out.

This leads to the proposition that if the goal of a school board is to maximize the size of its budget, school budget votes should be undertaken at a separate time than the general election. Indeed, it makes sense to hold the election when schools are in session so that voters whose children are enrolled in school will be less likely to be away on vacation. In contrast, if the goal of a school board is to accurately represent the preferences of all voters in the district, school budget referendum should be held at the same time as the general election.

A study of all school bond referenda held in Oklahoma from 1988 to 1992 and in Ohio from 1963 to 1987, as well of a sample of school bond referenda held nationally in 1994 confirmed that these votes were scheduled at times that would be most favorable for their passage see Dunne, Reed, and Wilbanks (1997). Similarly, all initial school budget referenda in New York State are currently held on a common day during the spring when schools are in session.

Encouraging turnout of voters that the school board wants to show up is an art rather than a science. Getting parent groups to participate in the budget development process and helping to turn out the vote is an obvious strategy. So too is making sure that balloting takes place in every elementary school in a district to minimize the time it takes voters to find and travel to voting locations. A perhaps more subtle strategy, that has been practiced for many years by a number of school districts, is to schedule events at each elementary school that will bring many parents to the school during the day and night of the budget referendum for reasons other than the referendum. While parents are at the schools, they can of course vote on the school budget.

To our knowledge, there have been no studies that incorporate the strategies that school board use to pass their budgets into analyses of the type that we have done. We would also expect that districts that pursue prudent strategies would also be able to have higher tax rates and expenditure levels than districts that did not, other variables held constant.

Notes

[1] The highest correlation of per-student real aid changes across school districts in our sample for any two adjacent years was 0.33. For the vast majority of adjacent years, the correlation was under 0.1.

[2] A few "special act districts"—districts established for special purposes such as the education of youths with criminal records in residential detention centers and the education of youths with disabilities—also do not have their budgets determined by budget referenda. These districts are excluded from all the analyses that follow.

[3] See for example, Brokaw, Gale and Metz (1990a, 1990b); Courant, Gramlich and Rubinfeld (1980); Gramlich and Rubinfeld (1982); Lankford (1985a, 1985b); Rubinfeld (1977).

[4] Using district-level school referendum data for Illinois, Lentz (1999) found that voter homogeneity was an important predictor of budget vote success and, using district level voting data in Oregon, Stevens and Mason (1996) found that the tax prices that voters faced was a significant predictor of referenda success.

[5] If a school board accurately represented the preferences of residents of its school districts, a change in any of the variables discussed in this paragraph, should also influence the size of the budget proposal that the school board submits to the voters (Rosenthal, Romer, & Munley, 1992). Hence in a formal sense, the postulated relationships that follow are based on the school board not behaving as if it were the median voter in the district. As we have noted above, a number of studies find evidence that school boards in some districts act as if they are trying to maximize their budgets, not as if they are the median voters.

[6] The New York State budget has been passed by both houses of the state legislature and signed into law by the Governor on time only once since 1982. 2004 marked the 20th straight year that the budget was not approved on time.

[7] Estimates of this equation and the others that follow that control for autocorrelation of the residuals prove to be virtually identical because the estimated Durbin-Watson statistic is close to two in each case.

[8] A referee has suggested to us that the failure of these variables to matter is not surprising because he or she believes that the statewide changes are likely to be the result of regionally concentrated changes in some of the variables (e.g., the migration of young people out of upstate New York areas that would lead to an increase in the share of the population that is elderly in these areas) and that the changes in these variables in these districts would influence the margins by which budgets were defeated or adopted in districts in those areas rather than the aggregate proportion of budgets passed in any year. In the panel data analyses reported below, we do find evidence that the share of students in a district attending private school and the share of a district's population that is age 65 or older both influence the budget pass rate in a district.

[9] A referee has noted that the lowest percentage pass rates reported in Table 1 occurred in 1978, which represented the start of the "anti-tax" tax movement (Proposition 13 in California and Proposition 2½ in Massachusetts) and in 1994, when the Republican Congress nationally put forth its "Contract with America." While each of these events might influence voters in New York State, as long as they are uncorrelated with the other explanatory variables in the model, their omission will not bias any of the coefficient estimates we present in Table 2.

[10] Available from http://www.emsc.nysed.gov/mgtserv/gemsho.htm, and http://www.emsc.nysed.gov/mgtserve.

[11] We were precluded from analyzing latter year's data, when we had more complete information on budget votes in all districts in the state, because of the lack of timely information on a number of the explanatory variables employed in the model.

[12] Examples of variables that could be useful in identifying whether school districts appear in our sample include the tenure of the current clerk of the school board and the average tenure of previous clerks during our sample period (which might be associated with the quality of school district records), the tenure of the current school superintendent and assistant superintendent for business (new administrators may be too busy to respond) and whether the school district was in the midst of major capital projects (that had already been funded), searches for key administrators or a major controversy (such as redistricting) at the time of our survey. High turnover of key personnel, administrative preoccupations with key searches, or controversy in the district at the survey date may all have led to lower probabilities of responding to the survey.

[13] Unfortunately, we cannot predict the directions in which coefficients of specific explanatory variables in the multivariate models that we estimate below may be biased.

[14] When we mailed the superintendents of all school districts that participated in our survey an earlier version of this article, one suggested to us that our finding may results from voters in districts in which there is voter discontent (and hence budget rejections) seeking to reduce the term of school board members so that incumbent board members can more quickly be replaced by candidates who favor smaller budgets. Put another way, he raised in our minds the possibility that budget defeats may lead to shorter terms for school board members rather than vice versa. To test this hypothesis, we resurveyed the 77 school districts in our sample in which budget referenda had been defeated more than 5 times during the 22-year period that we had collected data. We asked them if their had been a change in their school board member's terms during the period and, if so, what the change was. Only 9 of the 76 respondents to the survey indicated that there had been a change reducing the length of school board members' terms. We take this as evidence that it is reasonable to treat term length as exogenous in our empirical work.

[15] We also re-estimated this interaction term between the percentage change in state aid received by a district and the share of the district's budget that state aid represented because we hypothesized that changes in state aid would have a larger effect on voters' behavior in districts in which state aid was a larger share of the budget. When we estimated a simpler specification that entered the percentage change in state aid without the interactions, its coefficient was also not statistically significantly different from zero.

[16] The appendix of Ehrenberg, Ehrenberg, Smith and Zhang (2003) discusses this point and describes more fully the econometric model we use.

[17] Butler and Ehrenberg (1981) used a similar framework to analyze whether going to arbitration in contract negotiations in one year increases the likelihood that police and firefighters will go to arbitration in the next contract round in New York State.

[18] Again see the appendix of Ehrenberg, Ehrenberg, Smith and Zhang (2003) for details.

[19] At the suggestion of a referee (as in our aggregate time series analysis), we attempted to see if the timing of gubernatorial or state assembly and state senate elections significantly influenced voter's perceptions of likely increases in state aid and hence their votes on budget referendum. However, when included, dichotomous variables for gubernatorial elections (every 4 years) or assembly and senate elections (every 2 years) never proved to be statistically significant.

[20] These results are found in Ehrenberg, Ehrenberg, Smith and Zhang (2003), appendix Table A.

[21] Romer, Rosenthal and Munley (1992) found that districts whose expenditures per student were higher than predicted were more likely to be districts in which budget referendum were defeated. Using data for a single year, they observed that there was a negative correlation between the residuals from a school district spending equation and the residuals from a probability of budget referendum passage equation. We attempted similar analyses using our panel data to see if the probability of budget referendum passage was related to residuals from educational outcome or school tax rate equations (see Ehrenberg, Chaykowski, & Ehrenberg 1988 for examples of these equations). However, in no case did we find that budget referendum passage was associated with residuals from these equations. These efforts are described more fully in Ehrenberg, Ehrenberg, Smith, and Zhang (2003).

[22] We must caution that the role that local governments play in financing public elementary and secondary education varies widely across states, as does the nature of budget referenda, if they occur. For example, under proposition 2 ½ in Massachusetts, school budget referenda only take place if local school board want to propose local school budgets that will affect property tax rates to exceed 2.5% or that will cause property tax rates to rise at rates more than 2.5 percentage points a year (Bradbury, Mayer & Case, 2001). Hence one should be cautious in generalizing our states other than New York.

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