Why Do School District Budget Referenda Fail?

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by

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I. Introduction

Public elementary and secondary education is financed in many states at least partially at the local level and school district budgets in many states are determined by voter referenda. To date, however, there have been no studies that sought to explain why the proportion of school district budget proposals in a state that are approved by voters in referenda 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 and whether the failure of a budget referendum in a school district in one year influences the likelihood that voters in the district subsequently defeat a budget referendum in the next year. Our paper uses data from school budget votes in New York State to answer these questions.

We begin in the next section 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 historical data on the percentage of school board budgets in New York State that have been defeated each year. Inasmuch as the percentage varies over time, we estimate models of the determinants of the percentage of budgets that are defeated each year. A key variable proves to be the growth rate of real income in the state, while the effect of changes in state aid to education are small and at best marginally significant.

If the pass rate in a year is 80 percent, then in four-fifths of the districts the voters approve budgets and in one-fifth the voters defeat 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. The New York State Department of Education only keeps the results of individual school budget elections in file, in electronic or print form, for five to six years, so in section IV we describe a survey that we undertook of all local school districts in the state and show how the pass rates in our sample of respondents correspond to the pass rates reported in the aggregated published data each year. The frequency of budget rejections over a twenty two year period is shown to vary widely across school districts, with a substantial fraction of districts always having passed their budgets.

In section V, we estimate models of whether an individual 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 state school aid formulas in New York State are so complex and so political that percentage changes in state aid per student in any given year vary widely across school districts. Moreover the correlation across districts in the percentage increase in the real per student aid change going to a district in any two adjacent years is quite low.[1] This pattern of aid changes enables 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 granted to school districts 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

[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.

defeated in the current year. The answer proves to be yes and this leads us to try to 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).[2] After briefly describing some extensions of our empirical research in which we sought to ascertain if measures or changes in measures of school district "performance" influence budget vote passage, we provide some brief concluding comments in section VII.

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 to and local school district revenues. In 1999-2000, the former provided about 44 percent of total school district expenditures and the latter 52 percent, with the balance of funds coming from the federal government. The primary source of local school district revenues, approximately 90 percent 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

[2] James J. Heckman (1978) and James J. Heckman and George J. Borjas (1980)

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.[3] 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.

A contingency budget limits a district's expenditures in a number of ways, for example it reduces the district's transportation costs by increasing the distances that students must live from schools before free transportation to school is provided to them. Being forced to adopt a contingency budget is rarely in a school district's best long-run 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 do adopt their budgets without explicit votes of the voters. School districts that are located in the 5 largest cities in the state, Buffalo, New York City, Rochester, Syracuse, and Yonkers have their budgets determined by their school boards, subject to a constitutional tax limit on the total municipal budget. The 57 small city school districts, districts whose boundaries coincide

[3] Contingency budgets are capped at a percentage increase over the previous year's budget that is the minimum of 4 percent or 1.2 times the increase in the Consumer Price Index (CPI). Administrative costs are limited in contingency budgets, as are any expenses that are not deemed legally required to operate and maintain the school district.

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. Finally, a few school districts in the state are classified as "special act districts"; these districts have been established for special purposes, such as the education of youths with criminal records in residential detention centers and the education of youths with disabilities, and the school boards in these districts also determine their districts' budgets. 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 by which school budgets were approved.

A number of researchers have addressed how individual voters voted on specific budget referenda or tax limitation proposals.[4] 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, Thomas Romer, Howard Rosenthal and Vincent G. 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.[5] Paul Rothstein (1994), using district-level school budget referenda data for Michigan school districts in 1981,

[4] See for example, Alan Brokaw, James Gale and Thomas Metz (1990a, 1990b), Paul Courant, Edward Gramlich and Daniel Rubinfeld (1980), Edward Gramlich and Daniel Rubinfeld (1982), R. Hamilton Lankford (1985a, 1985b) and Daniel Rubinfeld (1980).

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

also found support for budget maximizing behavior of boards. Finally, Scott Feld and Joel Grossman (1984), used data for a sample of Long Island (NY) school districts during the 1970s and simple correlation analyses and found that the size of a school district's budget increase proposal in a year was positively related to 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 in the year.

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 percent in 1978 and 1994 to highs of over 90 percent 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.[6] 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.

Prior research that used state-level panel data found that an increase in the fraction of elderly voters in a state was associated with a reduction in educational spending per student and that this reduction was greatest when the elderly and the school age population came from different racial groups.[7] A more recent study that used county-level data found no direct effect of the share of the population that was elderly on school budgets, except when the school age and the elderly came from different racial groups.[8] 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 in the state will be on budget vote success. Finally if voters newly voting in small city school districts display different behavior than voters in districts where voting on the school budget has been a long tradition, one would have to control for the introduction of the small city voting in the analysis.

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[6] 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 and 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.

[7] James M. Poterba (1997)

[8] Helen F. Ladd and Sheila E. Murray (2001)

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.

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, to say the least. 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 higher in these years. However, before one takes these results too seriously, we must note that we

have neglected to mention one important fact, namely that the governor and state legislature in New York State have been unable to come to agreement on the state budget by the start of the New York State fiscal year (April 1) for as long as virtually anyone can remember.[9] Thus, the actual aid that a school district will receive during the next academic year is usually 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. They may form their expectations of the likely state aid increases in a different way. One simple alternative, for example, is for them to assume that the real percentage increase in state aid per student that the district will receive in the upcoming year is the same as it 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 that will occur 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 actual 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.

[9] 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. 2003 marked the 19th straight year that the budget was not approved on time.

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 to the budget pass rate 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.[10] 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.[11] 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.[12]

Column (3) presents parameter estimates from a similarly specified equation, save that enrollment growth, whose coefficient was insignificantly different from zero in column (2), is dropped from the equation. In this specification, the fraction of student enrolled in private schools becomes a statistically significant (at the .10 level of significance) negative predictor of budget pass rates. However, we caution that this variable's coefficient was not close to being statistically significant when enrollment

[10] The impact of a change in an explanatory variable in the log odds model depends upon the values of all of the explanatory variables in the model. We use their values in 1998 because this was the last year that data on all the explanatory variables was available to us.

[11] 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.

[12] 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.

growth was included in the model and enrollment growth clearly is correlated over time with the fraction of students in private school. Thus, while this result is suggestive that a greater fraction of students enrolled in private schools is associated with a lower aggregate pass rate, one should view this evidence as very tentative.

In column (4), we estimate a variant of the model in column (2) 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 for state assembly and state senate seats are held every two years. Other factors held constant, one might expect that the political process will "deliver" greater increases in school aid in these 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.[13]

IV. Individual School District Data

Although the New York State Education Department's Office of Enrollment Management Services has maintained 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 5 to 6 years. Currently, only the individual school district vote passage records for the votes taken during the 1998-99 to 2002-03 school years are available from it.[14]

To obtain historical data, the Survey Research Institute at Cornell University conducted a survey for us of all school districts in New York State, except for those in 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 in office.

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[13] 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 2 ½ in Massachusetts) and in 1994, when the Republican Congress nationally put forth its "Contract for American". 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.

[14] http://www.emsc.nysed.gov/mgtserv/gemsho.htm and http://www.emsc.nysed.gov/mgtserve

Of the 699 districts surveyed, 6 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 for which districts provided voting histories to us varied and not surprisingly 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 that took place in that year (table 1).

Table 3a provides information on the number of school districts that reported their budget votes to us for each year, 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 in each year. 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, on average, the divergence between the pass rate among districts in our survey that provided information for a year and the aggregate pass rate for all districts in the state gets larger. However, as the bottom panel of table 3a 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 every year between 1975 and 1997. Table 3b presents pass rate information for these districts; their average pass rates, both initially and finally, are slightly higher than the average pass rates found in the previous table. The correlation of the pass rates for these districts with the reported published pass rate is very similar to those found in the previous table.

Do budget pass rates vary systematically across school districts? A hint of this appears in the comparison of the results for all districts and for the respondents to our survey that appear in tables 3a and 3b. Table 4 confirms that they do by tabulating the number of times each of the 294 school districts saw their budget proposals defeated by the voters during the 22 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 had to adopt 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 22 year period. The norm is obviously 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 percent of the time and went to 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 percent.

V. Why Do Budget Referendum Failures Vary Across School Districts

The availability of data on the characteristics of school districts and their finances in New York State that is available in electronic form 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.[15] 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 discussion in the previous section suggests that this sample of districts 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 James 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.[16] As such, we have chosen not to pursue such approaches and must caution that the results that follow may be subject to selection bias.

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[15] 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.

[16] 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.

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 in 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.

Turning first to the baseline model estimated in column 1, which includes neither year fixed effects or district level fixed or random effects, suburban districts (SUBURB) are about 4 percentage points more likely to defeat initial school budget proposals than their rural district counterparts. Suburban districts tend to be larger than rural districts 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.[17] 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

[17]For example, see Romer, Rosenthal and Munley (1992) and Romer and Rosenthal (1982).

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.[18]

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 variables in the equation focus on changes in economic variables. 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

[18] When we mailed the superintendents of all school districts that participated in our survey an earlier version of this paper, 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.

represents reduces the initial failure rate by only 0.004 percentage points and this estimate is not significantly different from zero.[19] 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 from a similar model that also includes year fixed effects. The inclusion of year fixed effects controls for unobservable (to the researcher) factors that vary over time but not across districts that influence budget vote success. The magnitudes and statistical significance of most coefficients in this model is 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 add district level unobservable effects that are permitted to be correlated with the other explanatory variables to 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.[20] 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

[19] We also reestimated 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 hypothesize 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.
[20] The appendix discusses this point and presents the econometric model in some detail.

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. This model 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.[21]

It is well-known, however, that simply including whether a budget referendum was defeated in the previous year on the right-hand side of the estimating equation and estimating the equation by ordinary least squares does not permit one to distinguish between the hypothesis that budget defeats in one year do truly 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 that influence the probability of a budget being defeated (*heterogeneity*).[22] Such omitted variables, which influence the budget vote outcome 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.

[21] Richard Butler and Ronald 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.
[22] James Heckman (1978) and James Heckman and George Borjas (1980)

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 to obtain the estimates in column 4.[23] The estimated marginal effects of the explanatory variables that were 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 if voters in a district defeat a budget referendum in one year, the probability that they will also do so in the next year increases by about 7.8 percentage points. Put another way, 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.[24]

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 now attempt to "explain" a very rare event (table 3b indicates that on average only 5.5% of our sample districts adopted contingency budgets each year), their results were very similar to those reported in tables 5.[25]

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[23] Again see the appendix for details

[24] 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.

[25] These results are found in appendix table A.

In particular, in our preferred model (column 4) we found evidence that adopting a contingency budget in one year increases 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 5 year terms rather than 3 year terms were about 2 percentage points less likely to adopt contingency budgets, other factors held constant.

VI. Does School District Performance Matter?

One important hypothesis, which we have yet to discuss, is how a school district's "performance" influences whether the voters approve the school district's budget proposal. Of course measuring school district performance is a tricky matter. There are numerous educational outcome measures (students' performance on third grade and six grade standardized PEP tests, students' performance on high school regents exams, drop out rates, attendance rates, college going rates) that one can (and we did) collect data on for each district each year. Other things equal, districts with higher student pass rates on tests, lower drop out rates, higher attendance rates and higher college going rates could all be said to be "better performing" districts educationally. Similarly, other things equal, districts that kept their property tax rate low could be said to be districts that are "better performing" financially.

Of course, other things are not equal. For example, districts in which parents are highly educated and value education highly might be expected to have higher educational outcome scores than districts without a highly educated group of parents, independent of anything that the school system does for its students. Similarly, districts with parents who highly value education might be expected to have higher tax rates, other factors held

constant. However, this would reflect the parents' preference for education, not poor financial performance of the school districts.

So a district's educational outcome measures and its tax rate reflect much more than its performance. In an earlier paper, two of us estimated performance measures for school districts by the residuals obtained from educational outcome and tax rate equations. The explanatory variables in these equations were characteristics of the districts, including the socioeconomic and demographic composition of their residents.[26] High performing districts were defined as ones whose educational outcomes were higher than expected and whose tax rates were lower than expected, given the characteristics of the districts. Similarly low performing districts were defined as ones whose educational outcomes were lower than expected and whose tax rates were higher than expected given the characteristics of the district. In our earlier paper, we studied the relationship between a district's educational and tax rate performance and the compensation and mobility of its school superintendent and found weak, but positive relationships.

We attempted similar analyses in this paper. Our budget vote failure models were expanded to include either measures of each district's educational and financial outcomes, measures of its educational and financial performance (the residuals from the outcome equations) or measures of the one-year changes in its educational and financial outcomes or performance variables. The hypotheses we sought to test were that school districts that either had higher outcomes, were high performing, or had improving performance, would be less likely to experience budget vote defeats than school districts

[26] Ronald G. Ehrenberg, Richard P. Chaykowski and Randy A. Ehrenberg (1988)

that either had lower outcomes, were low performing or experienced declining performance. We found, however, no support for any of these hypotheses.[27]

VII. Concluding Remarks

Our analyses of the aggregate pass rate data on budget referenda in New York State, as well of the panel data on budget pass rates in individual school districts in the state, have yielded a number of important findings.[28] 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 school year increases the likelihood that a district's voters will vote down a budget in the next year and this provides an extra incentive for school boards to try to avoid budget vote defeats. Measures of school district educational and financial performance do not appear to influence budget vote outcomes.

[27] 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. That is, 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.

[28] 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 effective 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 and Case, 2001). We also must caution that, as we have noted earlier, our panel data analyses may be subject to selection bias because our sample of school districts is not a random sample of all school districts in the state. Hence our findings should be viewed with these limits in mind.

Perhaps our most important finding, which prior research has not addressed, 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. The implication here is that having board members with longer (but staggered) terms increases the likelihood that the board is "tuned" into the preferences of the voters.

The public choice literature suggests the importance of trying to "endogenize" the median voter to increase the chance of passage of proposed budgets.[29] For example, if votes on school budgets took place in November 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 otherwise would be able to do if these voters did not turn out.

This leads to the proposition that <u>if</u> 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, <u>if</u> 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 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

[29] Rodney Fort and Douglas Bunn (1998)

passage.[30] Similarly, all initial school budget referenda and school board elections are currently held on a common day during the spring in New York State, 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.

[30] Stephanie Dunne, W. Robert Reed and James Wilbanks (1997)

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Table 1

Historical Budget Vote Data in New York State[a]

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

[a] Data for 1997-1999 include small city school districts voting for the first times

Source: New York State Department of Education
Office of Educational Management Services
(www.emsc.nysed.gov/mgtserv/bvhist.htm)

Table 2

Budget Pass Rate Equations: 1970-1998[a]

	(1)		(2)		(3)		(4)	
	Coeff.	t[b]	Coeff.	t	Coeff.	t	Coeff.	t
ENR (t-1,t)			4.930	1.46			4.175	1.10
AID (t-1, t)			3.477	1.84	3.138	1.63	3.615	1.86
INC (t-1, t)			8.153	2.20	7.715	2.03	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						
AGE65 (t)	15.644	0.34	-8.802	0.17	-38.250	0.76	-20.331	0.34
PRIV (t)	-7.290	0.44	-17.695	-0.98	-30.565	1.90	-21.196	1.07
CITY	0.928	2.25	0.836	2.26	0.676	1.87	0.715	1.59
LAG (t-1)							0.130	0.49
n		29		28		28		28
Adj. R2		0.27		0.47		0.44		0.45

[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

where

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)
AGE65 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

Table 3a

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

Table 3b

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

Year	Sample	Initial pass	Final pass	Published pass
1975	294	86.39%	93.88%	76.50%
1976	294	82.99%	93.88%	71.00%
1977	294	86.05%	94.56%	77.50%
1978	294	78.57%	89.12%	66.30%
1979	294	93.20%	97.96%	86.00%
1980	294	81.97%	91.16%	70.70%
1981	294	87.07%	95.24%	77.40%
1982	294	89.12%	96.60%	83.10%
1983	294	90.14%	95.24%	87.30%
1984	294	91.50%	98.98%	90.00%
1985	294	91.16%	96.60%	88.90%
1986	294	92.52%	98.30%	88.30%
1987	294	89.80%	94.90%	88.00%
1988	294	92.18%	95.92%	85.70%
1989	294	82.99%	95.92%	78.10%
1990	294	85.71%	94.56%	76.80%
1991	294	83.33%	90.82%	71.70%
1992	294	82.65%	92.86%	79.90%
1993	294	78.57%	92.18%	72.20%
1994	294	79.59%	90.82%	68.60%
1995	294	88.44%	93.54%	78.00%
1996	294	90.82%	94.56%	84.80%
1997	294	90.82%	95.58%	86.50%
Average		86.76%	94.49%	79.46%

	Initial pass	Final pass	Published pass
Initial pass	1.000	0.842	0.915
Final pass	0.842	1.000	0.862
Published pass	0.915	0.862	1.000

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

*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.

Table 5

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

	(1)	(2)	(3)	(4)
SUBURB	4.3104 (2.9)	3.8988 (2.7)	3.3191 (1.8)	3.0567 (1.8)
LESS18	-0.5208 (1.5)	-0.2795 (0.8)	-0.2765 (0.6)	-0.1869 (0.5)
MORE65	-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
X^2	210	236	184	250
Year Fixed Effects	no	yes	yes	yes
Dist. Random Effects	no	no	yes	yes

Where

SUBURB 1=suburban district, 0=rural district
LESS18 % population 5 -17 (interpolated between census years)
MORE65 % population at least age 65 (interpolated between census years)
BLACK % district students that are black
HISP % district students that are Hispanic
OTHER % district students that are American Indian, Alaska Native and Asian and Pacific Islanders
FLUNCH % district students receiving free or reduced price lunches
POVERT % children age 5 -17 in the district from families below the poverty line
LEP % district students with limited English proficiency
PUPMOB pupil mobility index
PRIVSCH % 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 1 = district voters rejected the budget on the first vote last year, 0 = no

Note: 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

Appendix

In the static model that underlies column (3) of table 5, the basic Probit model is:

(A1) $y_{it} = 1$ if $x_{it}\beta + c_i + e_{it} > 0$; and $y_{it} = 0$ otherwise

where the y_{it} takes on the value of one if district *i*'s voters reject an initial budget proposal in year *t* and zero otherwise, the x_{it} are the explanatory variables in the model (including year fixed effects), c_i is the unobserved effect for district *i*, and the e_{it} are random normally distributed errors.

An intuitive way to estimate this model is to treat the c_i as fixed effects without specifying the specific relationship between x_{it} and c_i. However, estimating c_i together with β may lead to biased estimates of the coefficients of the included explanatory variables, and this bias is likely to be even larger in dynamic models that include lagged dependent variables on the right hand side of equation (A1), such as the model that underlies column (4) of table 5 (see Heckman, 1981).

To integrate out c_i, its conditional distribution needs to be specified. The traditional random effects model assumes that

(A2) $c_i | x_{it} \sim N(0, \sigma_c^2)$

Unfortunately, this assumption that the random district effect is uncorrelated with the other explanatory variables in the model deviates from our goal of introducing the term c_i into the model to allow for the correlation between c_i and x_{it}. Hence, to obtain the estimates obtained in column 3 of table 5, we employ one of the methods described in Wooldridge (2002, p. 487) and assume that:

(A3) $c_i = \psi + \bar{x}_i\gamma + a_i$, where $a_i \sim N(0, \sigma_a^2)$ and $\bar{x}_i$ is the average of x_{it}.

After incorporating (A3) into (A1), we estimate the following random effects model to obtain the estimates found in column 3 of table 5

(A4) $y_{it} = 1$ if $\psi + x_{it}\beta + \bar{x}_i\gamma + a_i + e_{it} > 0$; and $y_{it} = 0$ otherwise

Note that in table 5, only the coefficients for those $\bar{x}_i$ with constant x_{it} over time are reported. The coefficients for the $\bar{x}_i$ that are computed from the x_{it} that vary over time are not reported in the table but they are estimated as part of the model.

Similarly, the dynamic model that underlies the estimates found in column 4 of table 5 is

(A5) $y_{it} = 1$ if $x_{it}\beta + \theta y_{i,t-1} + c_i + e_{it} > 0$; and $y_{it} = 0$ otherwise

We assume

(A6) $c_i = \psi + \theta_0 y_{i0} + \bar{x}_i\gamma + a_i$, where $a_i \sim N(0, \sigma_a^2)$ and y_{i0} is the budget vote outcome in the initial period. The panel data used in our estimation spans the 1985-86 to 1996-97 period and we use the budget vote for the school year starting in the fall of 1984 as the initial period outcome.

Substituting (A3) and (A6) into (A5), we obtain and estimate the model

(A7) $y_{it} = 1$ if $\psi + x_{it}\beta + \theta y_{i,t-1} + \theta_0 y_{i0} + \bar{x}_i\gamma + a_i + e_{it} > 0$; and $y_{it} = 0$ otherwise

Appendix Table A

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

	(1)	(2)	(3)	(4)
SUBURB	3.1630 (3.5)	2.8130 (3.2)	1.5956 (1.8)	1.6029 (1.8)
LESS18	-0.0980 (0.5)	0.0260 (0.1)	0.0148 (0.1)	0.0222 (0.1)
MORE65	-0.7883 (4.0)	-0.7754 (4.1)	-0.6032 (3.1)	-0.6108 (3.1)
BLACK	-0.2750 (3.6)	-0.2513 (3.4)	0.3003 (1.2)	0.3153 (1.1)
HISP	0.1683 (1.3)	0.2070 (1.6)	0.2456 (0.8)	0.2604 (0.7)
OTHER	-0.0372 (0.2)	-0.0862 (0.5)	0.0456 (0.1)	0.1887 (0.4)
FLUNCH	0.0298 (0.9)	-0.0737 (1.8)	0.0094 (0.2)	0.0139 (0.3)
LEP	-0.0433 (0.1)	-0.0576 (0.2)	-0.2247 (0.5)	-0.2495 (0.5)
POVERT	-0.1291 (1.6)	-0.0340 (0.4)	0.0008 (0.0)	-0.0041 (0.0)
PUPMOB	0.0606 (0.2)	0.1929 (0.8)	-0.0010 (0.0)	0.0303 (0.1)
PRIVSCH	0.1600 (2.7)	0.1569 (2.8)	0.1145 (2.0)	0.1134 (2.0)
INCOME	-0.2078 (3.6)	-0.2389 (4.2)	-0.1770 (2.9)	-0.1743 (2.8)
COLLED	-0.1052 (2.2)	-0.1176 (2.5)	-0.0905 (2.0)	-0.0971 (2.1)
BOARDT	-1.5827 (4.0)	-1.4794 (3.9)	-1.0687 (2.9)	-1.0480 (2.8)
BOARDS	0.3887 (3.6)	0.3645 (3.5)	0.5048 (0.7)	0.6529 (0.7)
PCTINC	-0.7781 (4.8)	-0.5231 (2.2)	-0.3716 (2.1)	-0.4249 (2.1)
PCTVAL	0.0025 (0.1)	0.0347 (1.0)	0.0351 (1.3)	0.0426 (1.4)
PCTAIDS	-0.0031 (0.4)	-0.0031 (0.3)	-0.0017 (0.3)	-0.0015 (0.3)
LFAIL				4.1542 (4.9)
N	4560	4560	4560	4560
X^2	122	131	105	152
Year Fixed Effects	no	yes	yes	yes
Dist. Random Effects	no	no	yes	yes