

The Political Economy of Voter Support for School Property Taxation

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Lindsay Amiel

University of Wisconsin-Madison and
Madison College

Jared Knowles

Wisconsin Department of Public Instruction

Andrew Reschovsky

Lincoln Institute of Land Policy and
University of Wisconsin-Madison

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Abstract

Like a number of other states, Wisconsin places revenue limits on its local school districts. This paper explores the factors that lead school boards to hold referenda to override the limits, and voters to approve the referenda. To account for this two-stage decision process, we estimate a Heckman sample selection model using a panel dataset of Wisconsin's school districts. We find that some socio-economic characteristics of the median voter are important in the decision of school districts to hold referendum. The fund balances of the school districts and the amount of non-school property taxes that voters must pay also influence school board decisions. The success of neighboring school districts in passing override referenda encourages both school board decisions and the success of override referenda.

About the Authors

Lindsay Amiel is currently an economics instructor at Madison College. She completed graduate work in agricultural and applied economics at the University of Wisconsin-Madison.

Lindsay Amiel
Department of Agricultural and Applied Economics
University of Wisconsin-Madison and
Madison College
(608) 243-4226
LAmiel@madisoncollege.edu

Jared Knowles currently serves as a research analyst with the Wisconsin Department of Public Instruction, where he has led the design and deployment of the award-winning Wisconsin Drop-out Early Warning System (DEWS). He recently completed his Ph.D. in political science at the University of Wisconsin-Madison.

Jared Knowles
Research Analyst, Wisconsin Department of Public Instruction
125 S. Webster Street
Madison, WI 53705
(608) 266-5186
jared.knowles@dpi.wi.gov

Andrew Reschovsky is a research fellow in taxation at the Lincoln Institute of Land Policy and a professor emeritus of public affairs and applied economics at the University of Wisconsin-Madison. He earned his Ph.D. in economics from the University of Pennsylvania.

Andrew Reschovsky
Research Fellow in Taxation, Lincoln Institute of Land Policy and
Professor Emeritus of Public Affairs and Applied Economics
University of Wisconsin-Madison
113 Brattle Street
Cambridge, MA 02138-3400
(608) 332-8252 or (617) 503-2129
reschovsky@lafollette.wisc.edu

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The Political Economy of Voter Support for School Property Taxation

Introduction

Marika Cabral and Caroline Hoxby (2012) have characterized the property tax as a “hated” tax. Over many decades, public aversion to the property tax has clearly motivated efforts in most states to reduce reliance on the property tax or to limit its growth. Despite the continued adoption of new property tax limitations, the property tax continues to provide approximately four out of every five dollars of locally-raised public school revenue. In fact, since the early 1980s, the share of total public school revenue from the property tax has remained quite stable at near 35 percent (McGuire, Papke, and Reschovsky 2015).

One reason for the staying power of the property tax is the lack of growth of alternative sources of revenue. While there has been a modest growth in the federal government’s role in financing public education over the past decade, this growth has been more than offset by a reduction in the share of public school funding coming from state governments. At the local level, school districts have chosen not to increase their use of fees and other forms of non-tax revenues as a means of substituting for property tax revenue (Downes and Killeen 2014). Since 1995, there has been a rapid growth in revenue from school supporting non-profits, such as parent teacher organizations; however, on a per pupil basis, these revenues remain very low (Nelson and Gazley 2014).

The cyclical stability of property tax revenues may also reflect the fact that, in practice, many property tax limitations allow for the continued, but limited growth of property tax revenues. In this paper we focus on property tax levy limits. In general, levy limits place a dollar or percentage cap on the annual change in property tax levies of local governments. While the design of levy limits varies across states, many are similar to Massachusetts’ Proposition 2½, which limits the annual increase in property tax levies to 2.5 percent. In many states, if the rate of net new construction exceeds the levy cap, levies are allowed to increase at the rate of net new construction. Furthermore, property taxes dedicated to the payment of debt service for capital projects are usually excluded from the caps. Some states also exclude levies from the cap that are designated for pensions, or other specific categories of spending.

In 21 of the 38 states applying levy limits, an important feature of the limits is the ability of local voters to override the limit by utilizing a referendum process (Lincoln Institute of Land Policy 2014). In order to assess the role that property taxes will play in school funding going forward, we must first better understand the referenda process and the factors that influence both why school boards choose to hold referenda as well as their subsequent success or failure with the voting public. While the use of direct democracy through the referendum process may better align school district spending with the preferences of the median voter, the referenda process may have unintended consequences from a statewide perspective. For example, if levy limit referenda are more likely to be approved in high-income communities, a state’s school finance equalization goals may be undone.

Although there is fairly extensive literature on the impacts of tax and expenditure limitation on education revenue and student performance,¹ there are only a few studies that focus on the override of revenue limits through the use of referenda. This paper contributes to the existing literature by investigating the factors that lead to successful override elections. Wisconsin school districts have operated under a revenue limit since 1993, when the state legislature enacted revenue limits that apply to the sum of each school district's property tax levy and equalization aid from the state.² While school districts can hold referenda to exceed their revenue limits, approval by a majority of voters is needed to override a revenue cap. We utilize data from the state of Wisconsin on both attempted and successful levy limit override referenda as a way to better understand why, and under what circumstances, voters approve higher property tax levies.

In the upcoming sections of this paper, we will review the literature on property tax referenda before briefly describing the school funding system in Wisconsin, focusing on the state's revenue limit. We then describe our empirical approach for explaining both decisions to hold override referenda and for predicting successful overrides. Unlike previous literature on school district referenda decisions, which uses a one stage approach, we employ a Heckman Two-Stage selection model in order to better capture the decision making process of school boards and voters. After briefly describing the data, we discuss our econometric results. In the following section, we employ simulation techniques to determine whether the referendum process has undermined or enhanced equity in the funding of public education in Wisconsin. In the final section, we summarize the results and draw some conclusions.

Literature Review

Although there is quite a large literature on the impacts of property tax limitations on school funding, there have been relatively few studies on levy limit override elections. Piele and Hall (1973) provide an example of an early study of property tax rate decisions under state-imposed revenue constraints. Several papers have explored the override referenda associated with Proposition 2½, the property tax rate, and levy limitation enacted by the Massachusetts legislature in 1980 (Bradbury 1991; Bradbury, Mayer, and Case 2001; Cutler, Elmendorf, and Zeckhauser 1999; Wallin and Zabel 2011). These papers explore both the decisions of school boards to hold override referenda and the outcomes of these referenda.

There have been three previous studies of revenue limit override referenda in Wisconsin. Maher and Skidmore (2009) explore the factors influencing voter approval of override referenda using Wisconsin override election results through 2004.³ They find that standard economic, demographic, and political variables do little to explain the outcomes of override referenda: however, they find that school districts that pass bond referenda for capital projects are more likely to approve override referenda. Meredith (2009), using Wisconsin data on both bond and override ref-

¹ In their review of the literature on the impact of tax and expenditure limitations on public education, Downes and Figlio (2015) cite evidence that these fiscal limitations both reduce school district revenues and lead to lower academic performance by students.

² Revenue from federal and state categorical grants and revenue used for debt financing are excluded from the revenue limits.

³ In an earlier paper, Maher and Skidmore (2008) used Wisconsin data to study the determinants of bond referenda for capital projects.

erenda held between 1990 and 2006, found evidence of agenda setting behavior by school boards in timing their elections. The study found that higher value referenda were more likely to be held in a special election than during one of Wisconsin's four regular election dates. In a study that also included an analysis of referenda results in California, Colorado, and Minnesota, Shober (2011) used the results from Wisconsin bond and revenue limit override referenda between 2000 and 2005 to explore the role of political ideology in referenda results. Districts with higher shares of Republican voters were found to have lower probability of passing referenda.

School Finance in Wisconsin

In Wisconsin, the state government and independent local school districts share approximately equal roles in funding K-12 education, each providing about 45 percent of total public school revenues. As shown in table 1, local funding for the state's 423 school districts comes primarily from the property tax. From 2011 to 2012, the property tax contributed 42.9 percent of total public school revenues in Wisconsin, a substantially higher reliance on the property tax than the 35.9 percent of revenue coming from the property tax nationally.⁴

In 2013- 2014, the state government provided about \$5 billion in direct state aid to local school districts. Eighty-six percent of this total was allocated to school districts using a foundation aid formula supplemented by a guaranteed tax base formula. The formula is designed to achieve taxpayer equity by assuring that school districts that choose similar school property tax mill rates will be able to raise approximately similar amounts of money.⁵ The remaining state aid was distributed through over 25 separate categorical aid programs, the largest of which funded special education.

In 1993, concerned that school districts were using state aid to increase spending rather than reduce property taxes, the state legislature imposed an annual revenue limit on all school districts.⁶ With the exception of 2011-2012, when all revenue limits were reduced by 5.5 percent, each year after 1993 the legislature authorized a fixed dollar per student increase in the revenue limits. For the first year, 1993-1994, the annual revenue limit increase was set at \$190 per pupil. Over time, the annual increase was increased, reaching \$274.68 in 2008-2009. The annual per pupil adjustment to the revenue limits has been smaller in recent years; in 2013-2014 it was set at \$50 per pupil. In the majority of years since 1993, the annual adjustment allowed the per pupil revenue limit in the median school district to grow at or above the contemporaneous rate of inflation as measured by the Consumer Price Index. However, in nine of the years since 1993, and every year since 2010-2011, the annual adjustment allowed the revenue limit in the median district to grow at a rate slower than the rate of inflation.

Every year, each school district determines the amount it can levy through the property tax by subtracting its current year General Aid allocation from the current value of its revenue limit. We refer to this amount of property taxes as each district's "allowable levy." Data available from the

⁴ The (unweighted) arithmetic average across states of the local property tax as a share of public education revenue is 32.8 percent.

⁵ For a detailed description of Wisconsin's state General Aid formula, see Reschovsky (2002).

⁶ For a comprehensive description of the revenue limits see Kava and Olin (2015).

Wisconsin Department of Public Instruction show that since the imposition of revenue limits, the vast majority of school districts have chosen to levy up to their allowable levies.⁷ This fact suggests that the revenue limits are binding on most school districts.

One of the only ways that school districts can increase revenues, and hence spending, above the state-imposed limits is to successfully pass a referendum that allows the district to override their revenue limit. School districts can propose “recurring” referenda, under which the revenue limit is permanently increased by a voter-approved dollar amount, or “non-recurring” referenda, which authorize specific dollar increases for one year or for a specified number of years. Between 2002 and 2012, 599 separate override referenda were held and, of these, 285, or 47.6 percent passed. These numbers overstate the number of school districts that hold referenda because some school districts held multiple referenda during a year. As the focus of our econometric analysis is on school districts rather than on individual referenda, our unit of analysis is school district years. In other words, we analyze the number of school districts that hold one or more override referenda in any given year. Defined this way, between 2002 and 2012 there were 483 revenue limit override referenda held. Of these, 265, or 54.9 percent passed.

The analysis in this paper is conducted using data on 419 of the state’s 423 school districts.⁸ As illustrated by table 2, 173 districts (41.3 percent of the total) never held an override referendum during the 11-year period. In 113 school districts, a referendum was held only once from 2002 to 2012. Thus, less than a third of school districts held override referenda twice or more over this time period. Figure 1 illustrates both the number of school districts that held at least one override referendum in each year, and the pass rate in each year. In seven of the eleven years, fewer than 45 school districts held referenda. Even in the two years with the most referenda, 2007 and 2009, only 15 percent of districts held referenda. During the years from 2002 through 2012, the median success rate was 58 percent. Only in 2012, when relatively few referenda were held, did the pass rate exceed 70 percent.

For most school districts that successfully pass overrides, the dollar amounts of the overrides result in only modest increases in their revenue limits. The data in table 3 display the average successful override as a percentage of the district’s revenue limit prior to approval of the override. The averages rise over time and range between 4.3 percent in 2002 and 8.1 percent in 2012. Override amounts relative to revenue limits vary substantially across school districts. In 17 districts, overrides in one or more years increased revenue limits by more than 20 percent.

Conceptual Framework and Empirical Model

Overriding the state-imposed revenue caps involves a two-stage process, each stage with a different set of actors. First, local school boards must decide whether to ask voters for an override and, if so, the magnitude, purpose, and duration of the override. In the second stage, which oc-

⁷ Between 2002 and 2009 only about 5 percent of school districts chose a levy below their allowable levy. The total amount under-levied equaled one-half of one percent of the total allowable levy. In 2010 and 2011, when large state aid cuts increased the size of many districts’ allowable levies, total school property tax levies were only one and a half percent below the total allowable levies.

⁸ Four districts were excluded because they were involved in recent consolidations.

curs only in those school districts where an override has been proposed, an override is adopted only in districts where a majority of voters approve the override.

Starting in the 1970s, empirical studies of local government spending and of budget referenda have been used to reveal information about residents' demand for local public services (Bergstrom and Goodman 1973; Inman 1978). These studies showed that decisions about local government public spending in different communities reflected the public service demands of the voter with median income and median tax price. There is also a large literature that focuses on the behavior of the elected bodies that propose budgets for voter approval. One strand of this literature suggests that assuming single-peaked voter preferences, politicians, such as school board members, can maximize their chance for re-election by making spending proposals that reflect their best estimate of the desired level of spending (or taxation) of the median or decisive voter (Downs 1957).

Starting with Niskanen (1975), a second strand of literature has argued that rather than trying to mimic voter preferences, elected officials operate as agenda-setters who frequently propose spending levels that exceed the preferences of the median voter. Local elected officials may act like budget maximizers for selfish reasons: for example, to gain the political support of teacher unions. Alternatively, local school board members may have run for school board because they believe that increased spending will improve the quality of education (Balsdon et al. 2003).

In one frequently cited model of agenda setting, Romer and Rosenthal (1979, 1982) posit that locally-elected officials propose a level of spending (or taxation) equal to the maximum that the decisive voter will accept.⁹ If voters fail to approve the proposed budget, spending is set at a pre-specified reversion level. In the case of Wisconsin's override referenda, the reversion budget is equal to the revenue cap in the year the referendum is held.

The literature includes studies of the outcomes of school budget referenda that are generally consistent with the median voter model (Inman 1978; Rubinfeld 1977) and studies that are consistent with the model of a revenue-maximizing agenda setter (Romer and Rosenthal 1979, 1982; Rothstein 1994). In an interesting study, Romer et al. (1992) find that while in small school districts budgets reflect the preferences of the median voter, larger school districts appear to operate like budget maximizers.

In this paper, we model the decisions of school boards to hold override referenda and the decision of voters to approve or reject proposed overrides. Given the competing theories about the behavior of school boards, we include in our empirical model variables that are consistent with school boards attempting to reflect as closely as possible the preferences of the electorate, and variables that are consistent with school boards as budget-maximizers. Building on the median or decisive voter model, variables that reflect voters' preferences for education spending financed through higher property taxes should help explain decisions about whether to hold override elections. Alternatively, theories of agenda-setting by school boards suggest that strategic decisions

⁹ The literature has generally assumed that local officials will use their power as agenda setters to maximize local budgets. In recent years, the election of individuals to school board with the active support of the Tea Party movement and of organizations advocating "limited government," could result in agenda setters acting as budget minimizers by proposing budgets below the preferences of the median voter.

about the timing of referenda, the size of overrides, or the frequency of referenda may influence the outcome of override elections (Ehrenberg et al. 2004; Meredith 2009).

We model the outcomes of override elections, whether the override passes or not, as a function of variables reflecting the school funding preferences of the voters in each school district. If we assume that local school boards' choices of whether to hold an override election reflects, at least in part, school board members' perceptions about voters' preferences, then to avoid selection bias in estimating referenda outcomes it is important to model referendum outcomes using a two-stage probit model with a Heckman sample selection.

Equation (1) represents the decision process followed by local school boards in deciding to hold at least one referendum in each year (*ref_attempts*), while equation (2) represents the decision of voters to approve or not approve the override referenda (*ref_wins*). In equation (1), we assume that the decision to hold a referendum is based on a number of factors denoted by X_{it} . u_1 are the residuals.

$$P(\text{ref_attempt}_{it} = 1) = \sum \beta_k X_{it} + u_{1it} \quad (1)$$

$$u_{1it} \sim N(0,1)$$

In the second regression, voters in the subset of school districts that hold a referendum each year decide whether to override the revenue limit. This second stage "outcome equation" can be expressed as:

$$P(\text{ref_wins} = 1)_{it} = \alpha_0 + \sum \alpha_k Z_{it,k} + u_{2it} \quad (2)$$

$$u_{2it} \sim N(0,\sigma)$$

where $Z_{it,k}$ are variables representing the characteristics of each school district holding a referendum and u_2 are the residuals.

The Heckman selection model differs from a standard maximum likelihood model because it permits the residuals of the first equation (u_1) to be correlated with the residuals of the stage two equation (u_2). The correlation between u_1 and u_2 is given by ρ . If ρ is not significant, the two equations are not related and a simple probit model for each stage individually is sufficient. However, if ρ is significant, then a simple probit or logit model of our dependent variables (*ref_attempts* and *ref_wins*) would result in biased estimates.

Explanatory Variables

As we discussed above, there are two competing theories that might explain the decision of school boards to hold a referendum to override the revenue limit: the median voter model and the agenda setting model. The agenda setting model assumes that school boards are motivated to hold referenda in order to maximize school district budgets. The median voter model suggests that due to re-election pressures, school boards will make decisions based on the preferences of the median voter. School board members are more likely to hold an override referendum if they believe that local voters will support paying additional property taxes in support of public educa-

tion. In order to determine which model, if any, dominates the decision-making process of school districts and voters, we include fiscal, demographic, and political variables in our analysis.

Our analysis includes four demographic and political variables: the percent of voters who voted Democratic in the previous gubernatorial election (*Democrat*), the percent of the population that is over the age of 65 (*% elderly*), the percent of the population whose income is below the poverty line (*% poverty*), and the natural log of the number of people in each school district who are eligible to vote (*Ln(voting populations)*). A number of authors have found that political ideology, measured by partisan election results or survey responses, is a good measure of willingness to support property tax increases to fund education (Chew 1992; Shober 2011). We define a political ideology variable as the percent of the population of each school district voting for the Democratic candidate during the latest gubernatorial election. Ward level voting data from the Wisconsin Government Accountability Bureau was used to determine the share of voters voting Democrat in each school district.¹⁰ We hypothesize that school districts with higher Democrat vote totals are less fiscally conservative, and thus more willing to approve override referenda.

The relationship between demand for education and the percent of the population that is elderly is unclear. A number of studies have found that support for educational funding is inversely related to the percentage of the population that is elderly (Brunner and Balsdon 2004; Figlio and Fletcher 2012; Fletcher and Kenny 2008; Harris, Evans, and Schwab 2001). In particular, Brunner and Balsdon (2004) conclude on the basis of survey data that there is less support for school bond initiatives among the elderly than among younger populations. However, there are also several studies which come to the opposite conclusion (Berkman and Plutzer 2004; Gradstein and Kaganovich 2004). Therefore, we remain uncertain about the sign of its coefficient in our analysis.

Since the property tax is more likely to be seen as a benefits tax in small school districts with homogenous spending preferences, it is reasonable that the probability of both holding override referenda and passing them is higher in small, homogeneous school districts. In studies of Proposition 2½ override referenda in Massachusetts, Bradbury (1991) and Wallin and Zabel (2011) both found that the override elections were more frequent in small, suburban communities.

School districts with a higher proportion of students coming from poor families are generally more heterogeneous in terms of social and economic class, and often racial and ethnic backgrounds.¹¹ We thus include the variable *% Poverty*, as a measure of school district heterogeneity. The variable is measured as the percent of students in each school district that are eligible for the federal Free and Reduced Lunch program. To the extent that poverty is a proxy for community heterogeneity, we hypothesize that higher poverty will reduce the probability of override referenda and their approval by voters.¹² On the other hand, as greater concentrations of children from poor families lead to higher expenditure needs for school districts, increased poverty could be

¹⁰ The ward level data was aggregated to the municipality level. Then, using a crosswalk between municipalities and school districts from the Department of Revenue, a share of voters from each municipality was assigned to their corresponding school district based on the proportion of property wealth in each municipality belonging to each school district.

¹¹ In 2012, the simple correlation between the percentage of students from poor families and the percentage of Wisconsin school districts' population that is white was -0.32.

¹² In a study of local governments in Illinois, Temple (1996) concludes that homogeneous communities in terms of income and age are more likely to remove state-imposed expenditure constraints.

associated with more support for override referenda. For reasons described in footnote 13, income, education, and race variables are not included in our final model specifications.¹³

The last five variables we include in our analysis are related to the agenda setting model. There are two fiscal variables that might also impact whether school districts will propose a referendum and the probability of the referenda's success with voters. Voters' willingness to support additional school property taxes may be influenced by the non-school property tax rate they face. We expect that taxpayers who face what Neenan (1970) referred to as a "municipal overburden" will be less willing to support an override referendum for K-12 school funding. Likewise, school boards are likely to consider the overall property tax rate faced by district residents in deciding whether to hold an override referendum.

Given the apparent unpopularity of the property tax, we assume that school boards will only propose an override referendum when they face significant fiscal challenges in maintaining the quality of education. One clear indicator of the fiscal condition of school district budgets is the size of their fund balance per student. School districts with large balances in the previous year would find it hard to convince voters that they should vote for an increase in school property taxes. We thus assume that per student fund balances will have a negative sign in the first stage regression.

In a study of the probability of passing revenue limit override elections, Maher and Skidmore (2009) find that the prior passage of bond referenda for school construction projects was a good predictor of the approval of revenue limit override referenda. We assume that the willingness to approve bond referenda provides a good indicator of unobserved preferences for education. If voters are willing to support a bond for new construction, they may also be more likely to support additional funding for education, especially if it is for operating expenses associated with a new school facility. *Debt Pass* is an indicator variable that takes a value of one if voters approve a debt referendum in the same year as an override referendum. As the success of a debt referendum is not known to a school board, this variable only appears in the second stage regression.

We also include a dummy variable (*Referendum in Place*) indicating whether a school district is currently operating under an override referendum. The willingness of voters to pass referenda in the past may serve as an indicator of their willingness to support higher school property taxes. However, faced with an override referendum, voters may feel that they have already raised property taxes in the past, and further increases are unnecessary. Thus, the expected sign of this coefficient in the second stage regression is uncertain.

School boards and voters may also be influenced by the decisions of "comparable districts" when making decisions to hold and to pass override referenda. Students and parents from school districts in the same athletic conference have the most direct and indirect contact with each other. Athletic conferences are organized roughly by size and geography in Wisconsin, reflecting a meaningful and relatively homogenous grouping of school districts. Therefore, we define a

¹³ A likelihood ratio test reveals that including these variables does not add significantly to the explanatory power of the model. The income, education, and race variables are also highly correlated with the four variables described above. Additionally, Wisconsin is a relatively homogeneous state and with a few exceptions, there is relatively little variation across school districts in median income, years of education, or racial composition. For example, in 2012 over 87 percent of school districts were at least 90 percent white, and 54 percent of districts were at least 95 percent white.

“comparable district” as school districts in the same athletic conference.¹⁴ If a comparable school district holds a successful referendum, then a school board may assume that voters in their district will be more willing to pass a referendum to override the revenue limit. We measure the *neighborhood effect* with a binary variable indicating whether a school district within the same athletic conference has passed an override referendum in the past two years. We expect the coefficient on this variable to be positive.

Data

We have constructed a panel of data for 419 school districts for the 11-year period from 2001-2002 to 2011-2012. Most of the fiscal data we use comes from either the Wisconsin Department of Public Instruction or the Wisconsin Department of Revenue. Demographic data come from the U.S. Census Bureau. As the census data were generally available only for 2000 and either 2007 or 2010, we used linear interpolations for the non-census years. The summary statistics for all of the variables for 2012 are displayed in table 4.

To explore whether school districts that never proposed an override referendum during the 2002-2012 period are different from school districts that held at least one override referendum, we display in table 5a the 2002 mean values for all the variables in the first stage of our model for school districts that held at least one referendum, the mean values for school districts that held no override referenda, and the differences in the means. In table 5b, we show the means of the explanatory variables in the second stage regression for school districts that approved at least one override referendum and for school districts that rejected all override referenda during the period between 2002 and 2012.

Although there appear to be some differences between the two groups of school districts, the differences are relatively modest. Among the most significant differences, school districts that held override elections voted more heavily Democratic than districts that held no referendum. School districts with a larger fund balance per student are less likely to hold an override referendum than districts with a smaller fund balance per student. The differences between school districts that have successfully passed an override referendum and those districts that have attempted but not successfully passed a referendum are more pronounced. School districts that have successfully passed an override referendum are more likely to vote Democratic, and have both a higher percentage of elderly residents and a higher percentage of students living in poor families. Finally, school districts that have successfully passed override referenda prior to 2002 were more likely to successfully pass overrides over the following decade.

Results

We model the revenue limit override process as a distinct two-stage process. In the first stage, all school districts are in the sample, and we seek to explain the conditions under which districts

¹⁴ Discussions with Department of Public Instruction staff indicated that most school boards and school administrators are most attuned to actions occurring in school districts belonging to the same athletic conference.

choose to offer voters the option to override state-mandated revenue limits. In the second stage, we investigate the successful passage of override referenda.

As discussed earlier, ρ is the correlation between the residuals in stage one and the residuals in stage two. If ρ is statistically significant, then the Heckman selection model is an improvement over the simple OLS probit specification. However, due to the complexity of the likelihood function, as well as the necessity of constraining the value of ρ such that $-1 \leq \rho \leq 1$, $\text{ath}\rho = \frac{1}{2} \ln \left(\frac{1+\rho}{1-\rho} \right)$

and $\ln \sigma$ are directly estimated during the maximum likelihood process instead of ρ and σ . As shown in the second column of table 6, $\rho = -0.739$, and $\text{ath}\rho = -0.947$ and is statistically significant at the 95 percent confidence level. The Wald test of independence between the selection and outcome equations also confirms that the Heckman selection model is preferable to a simple probit specification.

The importance of using a two-stage model can be seen when comparing the second stage of the Heckman selection model (displayed in the second column of table 6), where the dependent variable is conditional on success in the first stage, and the simple probit model (displayed in the third column of table 6), where we simply model the successful passage or failure of a referendum attempt. The results show that the simple model overestimates the impact of the independent variables on the success or failure of a referendum. In absolute value terms, the coefficients from the simple probit are larger than the coefficients in the Heckman selection model. Additionally, there are two variables which are significant in the simple probit model, but not in the Heckman selection model. These results underscore the importance of using a Heckman selection model.

Given the panel nature of our data, we would have preferred to estimate a fixed or random effects model. However, because in any given year the vast majority of school districts choose not to hold an override referendum, it proved impossible to estimate a fixed or random effects model. We do, however, use robust standard errors to account for heteroscedasticity. We start by discussing the results from our stage 1 regression.

Stage 1 Results

The stage 1 regression results presented in the first column of table 6 attempt to explain the decisions of Wisconsin school districts to hold override referenda. Both variables consistent with the median voter and with the agenda setting model are statistically significant. The first four variables describe characteristics of the residents of each school district. The remaining variables describe various fiscal characteristics of each district that may be more closely related to strategic decisions taken by agenda setting school boards.

The variable *Democrat* is positive and statistically significant, implying that school boards in districts with a larger share of Democratic voters are more likely to hold a referendum to override their revenue limit than school boards in districts with fewer Democrats. School boards' decisions to hold override elections appear to be more heavily influenced by the past voting behavior of residents than many other voter characteristics such as income, race, or gender. Larger school

districts are less likely to hold override referenda, but the relationship is not statistically significant.

The stage 1 results also indicate that school boards in districts with more elderly voters are more likely to hold override referenda. This result may reflect a belief among at least some elderly homeowners that additional spending on public education will be capitalized into higher property values.¹⁵

Our results also indicate that school districts with a higher proportion of poor students are less likely to attempt override referenda. This result may suggest that districts with more income heterogeneity are less likely to hold referenda. The consequence of this result may be that, over time, per pupil revenues and spending in high poverty school districts will grow less quickly than spending in other districts. In the next section of the paper, we address explicitly the impact of passage of override referenda on the equity in school funding in Wisconsin.

As expected, we find that school districts with higher levels of non-school property tax rates and larger per pupil fund balances are less likely to attempt overrides. Thinking strategically, school boards may figure that voters who already face high property taxes for municipal and county government purposes are less likely to support an increase in school property tax rates. Likewise, the existence of relatively large fund balances both reduces the chances that voters will approve additional property taxes and also suggests that reducing the size of fund balances will be a politically easier way to increase spending than proposing to raise property taxes.

The results also indicate that school districts that have in the past successfully passed an override referendum that remains in effect (either because it was a recurrent referendum or a recently passed non-recurrent referendum) are more likely to attempt another override referendum.

Finally, we find that the probability of holding an override referendum is increased if another school district within the same athletic conference successfully passed an override referendum in the prior two years. To our knowledge, none of the previous literature on school district fiscal referenda has explored the role of school district peer effects in influencing school districts behavior.

Stage 2 Results

Our second stage looks at the outcome of override referenda in school districts that held referenda. The second stage results are influenced by the fact that there is much less variation in the values of the explanatory variables in the sub-set of school districts holding override referenda. In general, referendum success is more likely to be influenced by unobserved local circumstances and conditions. Research on school district bond referenda (Bowers et al. 2010) suggests that the wording of referendum questions and the exact timing of referenda are important determinants of successful passage of referenda. Unfortunately, we were unable to include many of the ballot characteristics in our analysis.

¹⁵ Ladd and Murray (2001) make a similar argument.

As expected, of those school districts holding referenda, smaller districts are more likely to be successful. Although our political variable was important in explaining decisions to attempt a referendum, it is not a significant determinant of referendum success. The statistical insignificance may be due to the strong selection effect in the first stage greatly reducing the variability in the partisanship of districts that do put a referendum before voters. It is also true that, in most cases, the override referendum voters are not necessarily the same population as fall election voters, as school districts in Wisconsin generally do not attempt referenda during the fall partisan primary or general elections. The other school district characteristics are not predictive of referendum success. Student poverty, the percent elderly, and the non-school district mill rate are all statistically insignificant.

The variables related to the agenda setting model have a much larger impact on the second stage of the regression. Consistent with Maher and Skidmore's (2009) results for an earlier time period, we find that the successful passage of a bond referendum increases the chances of a successful override referendum in the same year. It appears that school boards frequently link a bond and an override referendum by informing voters that the bond referendum approves the costs of building a new facility and the override referendum covers the ongoing costs of operating and maintaining the new facility.

The statistically significant positive coefficient on *Referenda in place* indicates that school districts that have previously approved recurrent overrides or non-recurrent overrides that remain in effect are more likely to approve another override referendum. We also find that the success of an override referendum is influenced by the behavior of school districts in the same athletic conference. An override is more likely to pass in school districts where a neighboring district successfully approved an override referendum in the past two years.

Another interpretation of these results is that as strategic actors, school districts use a common set of visible and publicly available information about their communities before deciding to offer a referendum. It also suggests that those features are not sufficient to explain the strategic behavior of school districts because those variables do a comparatively weak job of explaining the eventual success or failure of that referendum. It remains to be seen if the unobserved factors that do drive referenda success are known to school districts or not, but the success rate of override referenda over the last several years of our data suggests that school districts have information not captured in the present study to help them assess their chances of winning the authority to exceed their revenue limits.

The Impact of Override Referenda on Equity in School Funding

The ability of local voters to override the state-imposed revenue limits should enhance allocative efficiency by allowing a closer link between voter preferences and actual per pupil revenues. Nevertheless, over time the outcome of override referenda can have a substantial impact on the distribution of revenues across school districts. In this section, we use several standard measures found in the literature to assess whether the ability of voters to override the revenue limits has increased or decreased school funding equity.

As discussed in detail by Berne and Stiefel (1984), there are several distinct concepts of equity in school funding. State policymakers often focus on differences in revenues (or spending) per pupil across school districts as a measure of input equality. Most school finance experts argue that to measure equality of inputs, these numbers should be adjusted for differences in school district costs, reflecting differences in student characteristics, school district size, and other cost factors. As we are unable to determine appropriate cost adjustments, in this paper we will measure the equality of per pupil revenues by calculating coefficients of variation (the standard deviation divided by the mean) of revenue limits over the entire period revenue limits were in place.

Another measure of school funding equity focuses on fiscal or wealth neutrality. By this measure, a state school funding system that resulted in a very low correlation between school district property wealth and school district revenues would be considered to be highly equitable, or more precisely, fiscally neutral. To measure fiscal neutrality, we calculate the property wealth elasticity of per pupil revenue subject to the revenue limit. An elasticity close to zero would indicate that after the distribution of state aid, per pupil property wealth has little relationship with available revenue per student. Larger positive elasticities indicate that higher levels of per pupil property wealth are associated with higher levels of per student school district revenues.

Although Wisconsin's school funding system has been criticized for not adequately taking into account differences across school districts in the costs of providing education (Reschovsky and Imazeki 2001), it has, relative to many other states, done quite a good job in reducing the variation across school districts in per pupil revenues (Odden and Picus 2008). If the state provided no funding for education, local school districts would have to rely primarily on the property tax to fund public education. Each district's capacity to raise property tax revenue would depend on the size of its property tax base per student. As in most states, equalized property values per student in Wisconsin vary tremendously across school districts. In 2013-2014, the pupil-weighted coefficient of variation of the equalized value of property per student equaled 1.65.¹⁶ After accounting for the impact of state General Aid, the coefficient of variation of revenue per pupil under the revenue limits was only 0.088.¹⁷

The annual revenue limits applied to each school district reflect in part any past approvals of override referenda. To compare the impact of successful overrides, we compare each district's annual revenue limit to the revenue limit that the district would have had if it had never approved an override referendum. The most frequent type of override referendum is "non-recurring." This means that the revenue limit is increased for one or more years by amounts specified in the referendum. By contrast, the approval by voters of a "recurrent" referendum results in a permanent increase in the district's revenue limit. For example, if a district approves a \$250,000 override referendum, the revenue limit will be raised by that amount in every subsequent year. If the same

¹⁶ The coefficient of variation of equalized property values grew slightly over the past two decades. In 1993-1994 it was 1.62.

¹⁷ A similar picture of the impact of state aid is provided by comparing the *restricted range* (because of the large size of Milwaukee, defined here as the 12.6th and 90th percentiles) of equalized property values per pupil and the revenue limit per pupil. In 2013-2014, 12.6 percent of Wisconsin public school students live in districts with per pupil property values below \$305,649, while 10 percent live in districts with property values above \$858,138. By contrast, the 12.6th percentile revenue limit was \$9,028, while the 90th percentile is \$10,839. These data implies that as a result of state aid nearly four out of five Wisconsin students are educated in districts with per pupil revenue limits within a relatively narrow range.

district passes another \$250,000 recurrent referendum in the following year, the district's revenue limit will be increased a total of \$500,000 in each subsequent year.

To explore whether the approval of override referenda has had an impact on the equality of school district revenues, we compare actual revenue limits per pupil with a set of revenue limits that would have applied if no referenda had been approved. We calculate the latter set of revenue limits by reducing the value of each school district's annual revenue limit by the dollar amount of approved overrides in each year. Table 7 displays pupil-weighted coefficients of variation of per pupil revenue limits for each year from 1993 to 1994, the first year that revenue limits were in force, through 2013-2014. We calculate coefficients of variation for both the actual revenue limit per pupil in each year and the revenue limit net of all override referenda.

In 1993-1994, just prior to the imposition of revenue limits, the coefficient of variation of per pupil revenues from the sum of general state aid and property taxes was 0.128, a low number relative to many other states. The imposition of revenue limits had the effect of increasing revenue equality in Wisconsin. Between 1993-1994 and 2004-2005, the coefficient of variation fell to 0.085. There are two primary reasons why revenue limits increased equality. First, the fact that per pupil revenue limits were allowed to increase by a fixed dollar amount each year implied that relatively low-revenue school districts were allowed to raise revenue by a larger percentage amount compared to high-revenue districts. In 1993-1994, just prior to the implementation of revenue limits, per pupil revenues in the 10th percentile of the revenue distribution was \$4,540 and \$6,414 in the 90th percentile. The increase in the revenue limit in the first year was set at \$190 per pupil, an amount that allowed revenues to grow by 4.2 percent in the 10th percentile school district, but only by 3.0 percent in the 90th percentile district.

The revenue limit legislation includes a provision, the "low-revenue adjustment," which allows revenue increases in excess of the statutory per pupil adjustment for any school district with per pupil revenues below a low-revenue ceiling. The current value of the ceiling is \$9,100, and in 2013-2014 about 80 school districts remained below the ceiling.

Comparing the first two columns of table 7 allows us to observe the impact of successful override referenda on the equality of per pupil revenue. An explicit legislative goal of Wisconsin's school funding system is to reduce the variation across school districts in per pupil revenues.¹⁸ Comparing coefficients of variation of per pupil revenues with and without successful overrides shows that over the past decade, the cumulative effect of override referenda has been to increase the coefficient of variation in revenues across school districts. The last column of table 7 shows the percentage change in the coefficient of variations due to the passage of successful referenda. In the three most recent school years, the coefficients of variation are over 10 percent larger due to the passage of overrides. Without overrides, revenue limits would have continued to reduce the variation across districts in per pupil revenues. The data in table 7 show that over the past decade, the increase in per pupil revenue equality has been stalled as a result of the successful

¹⁸ In contrast to many other states, school funding formulas in Wisconsin take little account of the amount of money school districts need to provide their students with a good education. Over the past two decades, courts in a number of states have required that state governments guarantee that all school districts have enough money to assure that students can receive an "adequate" education.

passage of override referenda, and, over the past few years, due to the tightening of the revenue limits.

Table 8 shows the wealth elasticities of revenue for fiscal years 1994, 2004, and 2014. The wealth elasticity of revenue in 1994 was 0.6613, indicating that a one percent increase in property wealth per pupil, which is equivalent to an increase of about \$1,750 at the median property value per student, was associated with a 0.661 percent increase in revenue per pupil. This percentage change is equivalent to an increase of \$37 at the median level of per pupil revenue. As shown in table 8, over the past two decades the wealth elasticity of revenue in Wisconsin has been increasing, indicating that over time, local school district property wealth per pupil is becoming a more important determinant of school district revenues. The passage of revenue limit overrides has very limited impact on fiscal neutrality as measured by revenue elasticities of property wealth. In fiscal year 2004, our calculations indicate that the wealth elasticity would be very slightly reduced if no overrides had been adopted, while in fiscal year 2014, the success of overrides has resulted in somewhat smaller wealth elasticity than if no overrides had been successful. The differences, however, are quite modest.

Conclusions

With the prospects dim for substantial increases in federal and state funding for public elementary and secondary education, local revenue sources will likely grow in importance. In the average state, about 80 percent of locally-raised school revenue comes from property taxes. The willingness of Americans to continue to pay school property taxes, perhaps at higher rates, will help determine whether as a nation we can provide adequate funding for public education. Despite the important role of the property tax in funding both education and other local government services, most states have pursued policies to limit the growth of property tax revenues. In a substantial number of states, local voters are provided with an option to collectively decide to weaken state-imposed property tax limits by voting in a local referendum to override tax limitations.

This paper focuses on the state of Wisconsin, which has for over 20 years imposed limits on annual increases in the sum of state general aid and school property tax revenue. Local school boards, however, are allowed to hold referenda to override the dollar amount of the revenue limits. We explore the factors that lead school boards to hold referenda and voters to approve these referenda. We also explore whether the pattern of successful revenue limit overrides has the unintended consequence of counteracting Wisconsin's efforts to equalize education funding across school districts.

To help us understand the decisions by school boards to hold override referenda, and the decision of voters to approve or disapprove these referenda, we estimated a Heckman sample selection model. In the first stage, school boards decide whether to hold referenda, and in the second stage, voters decide whether to approve override referenda. In our analysis, we consider a set of variables that reflect the characteristics of both the median voter model and the agenda setting models.

For the most part, while the characteristics of median voters were statistically significant determinants of the decision of school boards to hold override referenda, they were less important

when determining whether voters would approve referenda. We found that school districts with larger fund balances and with higher non-school property tax rates were less likely to attempt referenda, while school districts with a more Democratic electorate and with neighboring districts that had recently approved referenda were more likely to attempt override referenda. We had limited success in explaining which districts successfully passed override referenda. Consistent with the findings of Maher and Skidmore (2009), we found that districts that also passed debt referenda were more likely to approve referenda. Additionally, having a prior referendum, as well as neighboring school districts with a referendum in place, both increased the likelihood of passage. The strength of these predictors relative to the demographic controls suggests that strategic action about referendum wording and timing may play an important role in referendum success.

Although Wisconsin's revenue limits have reduced school district revenues (and spending), they have also reduced the variation across school districts in per pupil spending. The growth in revenue equality occurred because fixed dollar per pupil increases in the revenue caps allow greater percentage revenue increases in low-spending districts, plus a low-revenue adjustment allows for larger revenue limit increases for low-revenue districts. By simulating revenue limits in the absence of any overrides, we have determined that over time, the impact of successful override referenda has been to increase the variation in per pupil spending across school districts. In 2013-2014, the coefficient of variation of per pupil revenues was over 14 percent larger than it would have been if no override referenda had been approved.

A well designed system of public education funding is built on a partnership between state governments and local school districts. State governments provide financing to local school districts to supplement local funds raised primarily from the property tax. A goal of most state education funding systems is to allocate funds so as to assure that all local school districts have sufficient revenue to provide their students with a good education. Many states also pursue policies designed to limit the variation in per student public school funding within the state, and to limit the use of local property taxes.

Wisconsin, by imposing increasingly tight limits on the total revenues available to school districts, is forcing many districts to make substantial cuts in educational programs. The only mechanism for reducing these cuts is the ability of local school districts to hold referenda to increase property taxes above the state-imposed limits. Our analysis highlights the presumably unintended distributional consequence of limiting the use of school property taxes.

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Tables

Table 1

Public School Revenue by Source, Wisconsin and the U.S., 2011-12

	Wisconsin			United States	
	Amount ('000s)	% of Total		Amount ('000s)	% of Total
Federal	\$953,230	8.8%	▼	\$61,043,194	10.2%
State	4,806,328	44.2%	▼	271,452,810	45.2%
Local	5,119,983	47.1%	▼	267,992,581	44.6%
Property taxes	4,665,016	42.9%	▼	215,813,214	35.9%
Total Revenue	\$10,879,541	100.0%		\$600,488,586	100.0%

Source: Authors' calculations using data from the National Center for Education Statistics (2015).

Table 2
Number of School Districts by Frequency of Revenue
Limit Override Referenda between 2002 and 2012

Number of Years Referenda Held	Number of School Districts	Percentage of School Districts
No referenda	173	41.3%
Once	113	27.0%
Twice	67	16.0%
Three times	43	10.3%
Four times	14	3.3%
Five times	7	1.7%
Six times	1	0.2%
Seven times	0	0.0%
Eight times	0	0.0%
Nine times	0	0.0%
Ten times	1	0.2%
Total	419	100.0%

Figure 1

Number of School Districts Holding Override Referenda (bars) and
Percentage that Passed (line), 2002 to 2012

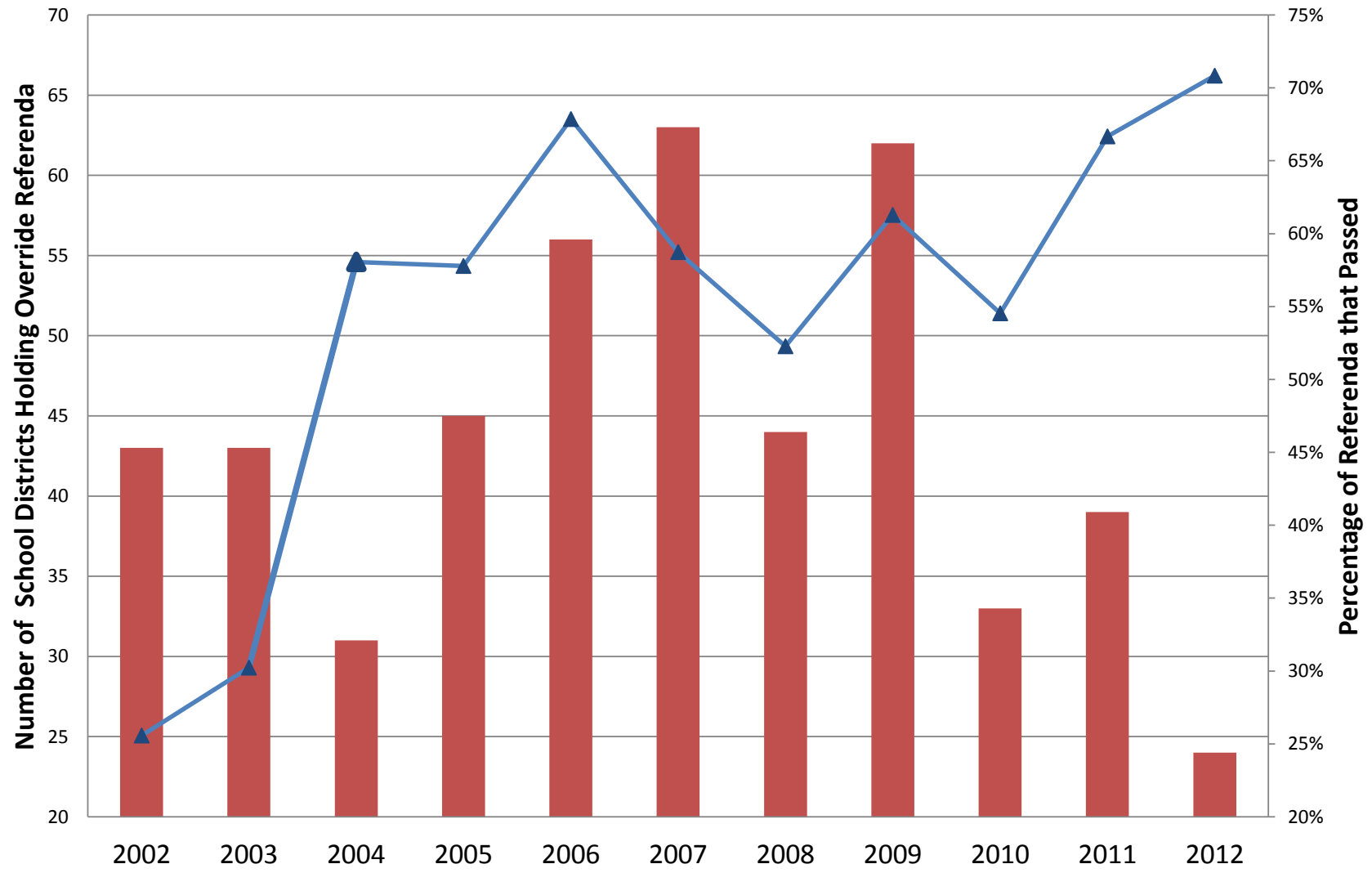


Table 3
Override Amounts in Each Year as a Percentage
of School District Revenue Limits Net of Overrides

Year	Overrides as a Percentage of Revenue Limits
2002	4.3%
2003	4.6%
2004	4.9%
2005	5.3%
2006	5.7%
2007	6.2%
2008	6.5%
2009	6.8%
2010	7.4%
2011	7.4%
2012	8.1%

Source: Authors' calculations using data from the Wisconsin Department of Public Instruction.

Table 4
Summary Statistics for Year 2002

Variable	Mean	Std. Dev.	Minimum	Maximum
Democrat	48.7%	10.5%	19.1%	79.9%
Voting age population	10,021	25,249	511	427,379
% Elderly	14.5%	4.0%	6.1%	30.0%
% Poverty	21.0%	13.7%	0.0%	81.2%
Non School District Mill Rate	1.14	0.27	0.297	1.98
Fund Balance per Member	\$6,222	\$3,858	-\$1,392	\$28,245
Passage of Debt Referenda	0.054	0.228	0	1
Neighborhood effect	0.591	0.490	0	1
Referenda in Place	0.284	0.375	0	1

Table 5a

Differences of Means of Explanatory Variables in 2002 between School Districts with At Least One Override Referendum in the Period from 2002 to 2012 and School Districts with No Override Referenda

	At Least 1 Referendum	No Referenda	Differences
Democrat	49.6%	47.4%	2.2% ** (1.0%)
Voting-Age Population	9,618	10,595	-977 (2,550)
% Elderly	14.6%	14.4%	-0.2% (-0.4%)
% Poverty	20.8%	22.0%	-1.2% (1.4%)
Non School District Mill Rate	1.14	1.15	-0.01 (0.025)
Fund Balance Per Member(Lagged)	\$5,808	\$6,811	-1,003 ** (331)
Referenda in Place (Percentage of School Districts)	18.3%	15.0%	3.3% (4.1%)
Neighborhood Effect (Percentage of School Districts)	58.9%	60.7%	-1.8% (4.7%)

Statistical significance: ** = p<.05

Table 5b

Differences of Means of Explanatory Variables in 2002 between School Districts that Passed At Least One Override Referendum in the Period from 2002 to 2012 and School Districts where No Referenda were Successful

	At Least 1 Referendum Passed	No Referenda Passed	Differences
Democrat	51.5%	45.8%	5.7% ** (1.3%)
Voting-Age Population	9,304	10,245	-941 (2,387)
% Elderly	15.0%	13.7%	1.4% ** (0.55%)
% Poverty	21.9%	18.5%	3.3% ** (1.6%)
Non School District Mill Rate	1.15	1.18	-0.02 (0.03)
Debt Referendum Pass (Percentage of School Districts)	6.7%	7.3%	-0.6% (3.4%)
Referenda in Place (Percentage of School Districts)	22.0%	13.7%	8.2% ** (3.7%)
Neighborhood Effect (Percentage of School Districts)	60.4%	56.1%	4.3% (6.7%)

Statistical significance: ** = p<.05

Table 6

Regression Results: Holding Override Referenda and Success of Override Referenda

	Two-Stage Heckman Selection Probit		Simple Probit Model
	Stage 1 (Attempt Referendum=0,1)	Stage 2 (Pass=0,1 Attempt=1)	Stage 2 (Pass=0.1)
Democrat	1.14 *** (0.25)	0.412 (0.702)	1.65 ** (0.710)
Ln(voting population)	-0.19 (0.29)	-0.133 ** (0.053)	-0.174 ** (0.064)
% Elderly	3.20 ** (0.25)	2.02 (1.53)	4.85 ** (1.39)
% Poverty	-0.725 *** (0.186)	0.60 (0.365)	0.33 (0.474)
Non-School Property Tax Rate	-0.227 ** (0.106)	0.326 (0.22)	0.283 (0.287)
Ln(fund balance per student)	-0.218 ** (0.038)	----	----
Debt pass	----	0.472 ** (0.161)	0.639 ** (0.178)
Referenda in place	0.151 ** (0.06)	0.304 *** (0.147)	0.508 ** (0.145)
Neighborhood effect	0.157 ** (0.054)	0.304 ** (0.155)	0.601 ** (0.132)
Constant	-0.136 (0.433)	1.06 (0.763)	-0.989 (0.743)
Athrho		-0.947 ** (0.371)	
Rho		-0.739 *** (0.168)	

Statistical significance: * = p<.10, ** = p<.05, *** = p<.01

Table 7

The Impact of Revenue Limit Override Referenda on School Funding Equality

Fiscal Year	Pupil-Weighted Coefficients of Variation		Percentage Change in Coefficient of Variation because of Overrides
	Actual Per Pupil Revenue Limits	Per Pupil Revenue Limits w/ No Overrides	
Base 93-94	0.128	0.128	
1993-94	0.125	0.125	0.0%
1994-95	0.119	0.119	0.0%
1995-96	0.114	0.114	0.0%
1996-97	0.109	0.109	0.0%
1997-98	0.106	0.106	0.0%
1998-99	0.102	0.102	-0.3%
1999-2000	0.098	0.099	-0.8%
2000-01	0.097	0.097	-0.3%
2001-02	0.092	0.092	-0.6%
2002-03	0.088	0.087	1.2%
2003-04	0.091	0.086	5.8%
2004-05	0.085	0.082	3.7%
2005-06	0.084	0.082	2.0%
2006-07	0.082	0.080	2.3%
2007-08	0.083	0.082	1.0%
2008-09	0.082	0.079	3.6%
2009-10	0.086	0.079	9.1%
2010-11	0.083	0.076	9.0%
2011-12	0.084	0.074	13.1%
2012-13	0.083	0.074	11.5%
2013-14	0.088	0.077	14.4%

Source: Authors' calculations using data from the Wisconsin Department of Public Instruction.

Table 8

**The Impact of Revenue Limit Override Referenda on School Fiscal Neutrality
Wealth Elasticities of Revenue for Selected Years**

Fiscal Year	Actual Per Pupil Revenue Limits	Per Pupil Revenue Limits w/ No Overrides
1993-94	0.661	0.661
2003-04	0.690	0.689
2013-14	0.731	0.741

Source: Authors' calculations using data from the Wisconsin Department of Public Instruction.