STATE POLICY CONSEQUENCES FOR WISCONSIN'S SCHOOL DISTRICTS: SPENDING DISPARITIES, FINANCE FORMULAS, AND REVENUE RESTRICTIONS

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I. INTRODUCTION

Given the absence from mention of public education in the United States Constitution, which identifies the rights and responsibilities of the federal government, the responsibility for public education lies with the states. The Tenth Amendment to the United States Constitution, ratified in 1791, specifically states, “The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.”1 Article X, section 3 of the Wisconsin Constitution, adopted in 1848, declares, “The legislature shall provide by law for the establishment of district schools, which shall be as nearly uniform as practicable. . . .”2 Are Wisconsin's school districts as “uniform as practicable?” What have state policymakers done to achieve this objective? The purpose of this Article is threefold. First, we present a comprehensive review of the history and structure of school finance in Wisconsin, with an eye toward evaluating the degree to which K–12 education finance policy has changed over time. A key component of this review is a clear

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1. U.S. CONST. amend. X.
2. WIS. CONST. art. X, § 3.
presentation of the incentives created by school finance equalization formulas. Second, we present an empirical evaluation of the most recent changes in Wisconsin’s education finance policy, which occurred during 1996–1997, to determine whether those changes furthered the goal of uniformity—to the extent that it is practical. Last, policymakers are once again considering options for further changes in school finance, and it is our hope that the evaluation presented here is useful as they consider options for reform.

In Part II, we provide a summary of the history of education finance reform for the nation as a whole and for Wisconsin in particular. In Part III, we highlight the key elements of reform and the incentives introduced in school districts as a result of changing state education finance and tax restraint policies. In Part IV, we present an empirical evaluation of the effects of the 1996–1997 reforms introduced by the Wisconsin legislature. Part V summarizes our findings and conclusions.

II. OVERVIEW OF SCHOOL FINANCE REFORM

Over the past thirty-five years, American schools have been dramatically affected by school finance equalization (“SFE”). In the 1970s, the California Supreme Court ruled in the landmark case Serrano v. Priest that the state’s public school finance system was unconstitutional. The court also encouraged the state to create an education finance scheme that was not a function of school district wealth. Since 1970, all states have either experienced similar court rulings or legislators have taken the lead in reforming their systems of school finance. While every school district in the nation has been affected to some degree by SFE, we venture to say that SFE is generally not well understood. Courts and legislators have defined clear goals, but precisely how to implement reforms that are consistent with those goals is much less clear. Regardless, since the early 1970s, almost every state in the nation has enacted at least one major SFE reform aimed at redistributing resources from districts with high per-pupil property

3. Serrano v. Priest (Serrano II), 557 P.2d 929, 957–58 (Cal. 1976). In 1971 the California Supreme Court determined that, given the facts, the system was unconstitutional, but remanded to the trial court to determine whether the facts presented on appeal were true. Serrano v. Priest (Serrano I), 487 P.2d 1241, 1244, 1266 (Cal. 1971).


6. See id. at 1189.
values to those with low per-pupil property values. However, SFE policies are not always based on sound economic principles regarding taxation and redistribution. As noted by Caroline Hoxby, in practice, SFE schemes across the states have sometimes led to outcomes different from what had been the original intent. Below, we present a brief summary of SFE activity across the states and then offer a discussion that is specifically focused on the Wisconsin experience.

A. Education Finance Reform Nationwide

With the exception of Hawaii and Michigan, the funding of K–12 education is primarily a local responsibility, but state governments typically provide some sort of assistance to school districts. Prior to the 1970s, most state governments offered something called “categorical aid” to school districts to assist in the funding of K–12 education. Categorical aid is distinguished by two features: (1) it is funded by state income, sales, and other state taxes with the exception of property taxes; and (2) the amount of aid received by a given school district depends on characteristics such as mean household income and the poverty rate. Thus, aid is provided to a particular district on the basis that its residents have limited resources or that its students are relatively more expensive to educate. Categorical aid can be distributed either as a “flat grant” or as a “matching grant.” Under a flat grant, each district receives a per-pupil grant that depends on income level within the district—the lower the household income is, the higher the grant amount. Under a matching system, state governments develop a matching formula such that the amount of the grant depends on the amount of locally raised

7. Id. at 1189–90, 1212–13 (noting that “SFE has affected every school in the nation” and that a majority of states that have no SFE have equalization activity).
8. See, e.g., id. at 1190–91 (discussing the unintended consequences of California’s SFE).
9. Id. at 1190.
11. Hoxby, supra note 5, at 1193.
12. Id. at 1193–94.
13. Id. at 1194.
14. Id.
15. Id.
spending and the matching rate depends on household income—the lower the household income, the higher the matching rate.  

Following a series of court rulings regarding the fairness of school spending, states across America began to implement SFE reforms in one form or another. Generally, these reforms have taken two forms: (1) Foundation Aid and (2) Power Equalization or Guaranteed Tax Revenue ("GTR") schemes. Foundation aid is the most common and more moderate type of reform. It is in some ways similar to the flat categorical grant, except that instead of basing the grant on mean household income, the grant is based on per-pupil property values. In such a scheme, every school district is guaranteed a foundation level grant, but as per-pupil property values rise, the foundation grant is reduced.

GTR schemes can generate the greatest potential redistribution of resources. Generally, the goal of this type of reform is to provide state aid in such a way as to make the same tax rate generate the same amount of revenue for each school district. In this type of scheme, the amount of state aid depends on both per-pupil property valuation and tax rates; lower valuation and higher tax rates generate more state aid.

Wisconsin's courts have interpreted state constitutional law to mean that tax effort across school districts ought to generate similar amounts of per-pupil spending. Thus, the reforms that have occurred in Wisconsin, particularly the 1996–1997 reform, can be categorized as a GTR scheme. Next, we provide a concise discussion of the history of education finance reform in Wisconsin. A key objective is to identify the incentives introduced to school districts that are the direct result of changing state equalization formulas and of the introduction of state-imposed limits on school district revenues.

16. Id.
17. See generally Murray et al., supra note 4, at 791–94 (summarizing the challenges to the constitutionality of school–finance systems).
18. See Hoxby, supra note 5, at 1194–95. Power equalization and GTR schemes are fundamentally similar. As a result, this article will refer to them collectively as GTR schemes.
19. Id.
20. Id.
21. Id. at 1195.
22. See id.
23. Id.
24. Id. at 1195–96. Hoxby provides a detailed description of the most extreme GTR schemes, such as those imposed in California and New Jersey. See id. at 1196–97.
B. History of Reform in Wisconsin

In its constitution, adopted in 1848, Wisconsin declared in article X, section 3 that "[t]he legislature shall provide by law for the establishment of district schools, which shall be as nearly uniform as practicable." The establishment of separate school districts throughout Wisconsin was accomplished through the delegation of authority to local school boards. One such authority provided to local school boards has been the power to tax. Hence, local school districts have always collected local property taxes to support educational programs and services. The degree of reliance on the local property tax, however, has caused frustration among taxpayers and policymakers alike. In addition, because no two school districts are identical in size (geographic or population) or have the same ability to raise dollars through taxation due to varying amounts of local property tax base, the state has also provided financial support to schools. Initially, this support was provided to every school in the form of a flat amount of aid per pupil. This original aid, the Common School Fund or Library Aid, had as its purpose to support and maintain common schools in each district while purchasing suitable school libraries.

Because the property tax was the major source of funding for operating public schools across the state, the disparities across communities due to the impact of the uneven distribution of school enrollments and property tax bases had, by the 1920s, become apparent. In 1923–1924, the statewide equalized valuation was $5 billion (nominal dollars). Dividing that amount by the 480,000 students enrolled in public schools provided an average of $10,116 in statewide average tax base behind each student. While this produced an average tax rate of $9.25 mills ($9.25 per $1000 in property value), some communities paid more, while others paid considerably less. Examples that varied substantially from the average were the 30 districts in Adams County

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28. Id.
29. Id.
32. Id.
33. Id.
with less than $500 of taxable property per student and the 21 districts with more than $10,000.\textsuperscript{34}

In 1924 and 1926, state Superintendent of Public Instruction\textsuperscript{35} John Callahan recommended that the state provide greater financial support for public education and that an effort be made to adjust for the variations in available tax base among local districts.\textsuperscript{36} Sections 20.245(4)(b)(1) and 20.245(4)(b)(2) of the equalization law enactment of 1927 included a flat aid amount per teacher ($250) but also apportioned state funds on the basis of a guaranteed tax base of $250,000 for each elementary teacher.\textsuperscript{37} Districts with wealth in excess of the guaranteed amount were restricted to the first level, flat aid.\textsuperscript{38}

Public policy concerning the distribution of state aids to public schools continued with this combination of flat aids and an equalized distribution per teacher until 1949 when the legislature converted the formula to a per-pupil guaranteed tax base and increased the overall level of state support.\textsuperscript{39} Recognizing that property valuations and the number of pupils varied significantly among school districts, it was believed that local property valuations had to be supplemented by an additional tax base. Alan Kingston, author of The History of Wisconsin's General State Aid Formula for Elementary and High School Districts, wrote in 1983 that “Wisconsin's equalization aid program supplements the tax base in low valuation districts by placing a guaranteed valuation back of each resident child (rather than per elementary teacher unit) in an attempt to equalize educational opportunities for all of the students in the state.”\textsuperscript{40} State policymakers described the purpose of state support in 1949 in the following philosophy statement that still exists today, with only minor changes, in Wisconsin Statutes section 121.01:

It is declared to be the policy of this state that education is a state function and that some relief should be afforded

\begin{footnotesize}
\begin{enumerate}
\item \textsuperscript{34} Id.
\item \textsuperscript{35} Office of the Superintendent of Public Instruction required by article X, section 1 of the Wisconsin Constitution.
\item \textsuperscript{36} KINGSTON, supra note 27, at 2.
\item \textsuperscript{37} Id. at 3.
\item \textsuperscript{38} Id.
\item \textsuperscript{40} KINGSTON, supra note 27, at 10–11.
\end{enumerate}
\end{footnotesize}
from the local general property tax as a source of public school revenue where such tax is excessive, and that other sources of revenue should contribute a larger percentage of the total funds needed. It is further declared that in order to provide reasonable equality of educational opportunity for all the children of this state, the state must guarantee that a basic educational opportunity be available to each pupil, but that the state should be obligated to contribute to the educational program only if the school district provides a program which meets state standards. It is the purpose of the state aid formula . . . to cause the state to assume a greater proportion of the costs of public education and to relieve the general property of some of its tax burden.41

While labeled differently, the state aid structure that evolved at that time continued with the two-part system of flat aids and equalized aids. Significant change was then made to the state aid distribution system in the early 1970s when an overall tax base equalization program was enacted.42 The legislature at that time was influenced by (1) the recommendations from a task force appointed by then-Governor Patrick J. Lucey, which was named after its Chair, Ruth B. Doyle, mother of the current Wisconsin Governor; (2) the recommendations offered by a legislative council study; and (3) the urging of representatives of the Department of Public Instruction ("DPI").43 The result was a major overhaul of the school finance system as well as the imposition of cost controls on school districts.

Chapter 90 of the Laws of 1973, as adopted by the legislature and signed into law, contained a complete tax base equalization program.44 The changes included a significant increase in state funding to about 40% and the discontinuation of flat aids.45 A two-level, power equalizing, state aid formula was instituted that distributed state dollars on the basis of local tax base, with poorer districts getting proportionately more state support and wealthier districts getting less.46 In addition to increasing the level of state funding and instituting a new

41. ROSSMILLER, supra note 39, at 2.
42. Ch. 90, 1973 Wis. Sess. Laws 380-85; ROSSMILLER, supra note 39, at 3.
43. See generally KINGSTON, supra note 27, at 4.
44. Ch. 90, 1973 Wis. Sess. Laws 380-85; ROSSMILLER, supra note 39, at 3.
45. KINGSTON, supra note 27, at 146.
46. ROSSMILLER, supra note 39, at 3.
distribution formula, this legislation modified the kinds of local costs to be shared by the state by adding a portion of a district’s capital and debt retirement costs along with teacher retirement costs, which had previously been paid by the state.7 The effect was to provide tax relief to local taxpayers. The 1973 action also instituted a set of minimum education standards and imposed cost controls, although local districts could appeal for exemptions to meet the standards, to preserve ongoing programs, and to continue programs where federal funding lapsed.8 The purpose of the cost controls was to ensure that property tax relief would result from the increased state support.

The state aid distribution formula applied in 1973 was based on the concept of equalization.49 Equalization—as defined consistently in the DPI annual publication of Basic Facts and quoted here from the most recent issue—is “[t]he process of ensuring a minimum tax base (the guaranteed valuation) for the support of education for each pupil in Wisconsin, so that school districts which spend at the same level will tax at the same rate.”50 According to the 1992–1993 Basic Facts, “[t]he goal of an equalizing aid formula is to eliminate differences in ability to spend while allowing for variation in willingness to spend for education.”51

The two-level formula created in 1973 provided a guaranteed amount of property value behind each pupil at each of the two levels. These two levels were labeled primary and secondary aids.52 School district costs (shared costs) were divided between these two levels by a factor labeled the primary cost ceiling, which was defined at the time as 110% of the previous year’s statewide average shared cost.53 Costs below this amount were classified as primary costs and eligible for primary state aid.54 All spending above this threshold was defined as secondary costs and was shared by the state at a lower ratio. A lower level of guaranteed value (property value) was used to apportion aids

47. Id.
48. KINGSTON, supra note 27, at 143.
49. ROSSMILLER, supra note 39, at 3.
52. KINGSTON, supra note 27, at 140.
53. Id.
54. See id. at 140–41.
associated with these higher costs.\textsuperscript{55} This was done deliberately "to serve as a disincentive to high levels of spending."\textsuperscript{56}

Further equalization occurred within this formula because districts whose wealth exceeded the secondary guarantee and whose spending exceeded the threshold set by the primary cost ceiling incurred \textit{negative aids}.\textsuperscript{57} The degree to which a district's actual tax base exceeded the state secondary guarantee was used to reduce the district's primary aids.\textsuperscript{58} This type of negative aid has remained in every version of the state aid formula since.\textsuperscript{59} Under this formula, some wealthier districts became ineligible for state general aids because the amount of negative aid generated at the secondary level reduced the level of primary aid to zero. In a few situations involving very wealthy and high spending districts, the amount of negative secondary aid exceeded the primary aid altogether and created \textit{negative aid recapture}.\textsuperscript{60} This aspect of the formula was never implemented because it was subject to immediate legal challenge.\textsuperscript{61} Ultimately, negative aid recapture that would have required districts to levy a local tax to be remitted to the state and redistributed in other localities was deemed unconstitutional in November 1976 by the Wisconsin Supreme Court because it violated the Uniformity Clause in the state constitution.\textsuperscript{62} Consequently, according to Richard A. Rossmiller, Ph.D., "Wisconsin's general school aid equalization program can no longer be considered a true power equalizing program because districts having the same cost per student are not required to levy the same tax rate."\textsuperscript{63}

The two-level equalization aid formula remained intact as the major method of distributing state aid to school districts, with variations in the method of calculation of the state aid factors. From 1949 through 1973, flat aids were granted to high valued districts that were ineligible for equalized aid.\textsuperscript{64} These were distributed on a per-pupil basis. Although

\begin{itemize}
\item \textsuperscript{55} Id. at 141.
\item \textsuperscript{56} ROSSMILLER, supra note 39, at 3.
\item \textsuperscript{57} See id.
\item \textsuperscript{58} See ch. 90, 1973 Wis. Sess. Laws 383.
\item \textsuperscript{59} See KINGSTON, supra note 27, at 199 (noting the passage of the first negative aid provision).
\item \textsuperscript{60} Id. at 142.
\item \textsuperscript{61} Id. at 217; ROSSMILLER, supra note 39, at 3–4.
\item \textsuperscript{62} Buse v. Smith, 74 Wis. 2d 550, 581, 247 N.W.2d 141, 155 (1976); ROSSMILLER, supra note 39, at 3–4.
\item \textsuperscript{63} ROSSMILLER, supra note 39, at 4.
\item \textsuperscript{64} Id. at 2–3.
\end{itemize}
they were eliminated in 1973, flat aids, known as *minimum aids*, were reintroduced in the mid-1980s and existed until 1996. Special adjustment payments were also available to help cushion the local impact of reductions in aid from one year to the next. These served as a "hold harmless" that provided such a district with a portion of the aid it had received in the previous year. Examples included 90% or 85% of the prior year's aid amount. These aids continue in existence today.

State policymakers again sought to increase the level of state support in the mid-1990s. In 1993, a legislative commitment was made to two-thirds funding of schools (defined in the statute at that time as two-thirds of partial school revenues). This was done to significantly reduce the reliance on local property taxes. The level of state support was 48.4% in 1993–1994 and 52.7% in 1995–1996. To foster the desired property tax relief, controls on employee wage settlements were established and revenue limits were imposed on school districts. These controls went into effect in 1993, while the increase in state funding was actually implemented in 1996–1997.

With the increase in state funding came modifications in how the funds were distributed. In 1995, the formula was transformed from two levels of funding to three. The new three-tiered formula added a new level of sharing. Tertiary aids were added to the already existing primary and secondary aids, with the guaranteed valuation at the new primary level increasing to $2 million behind each pupil. This made every district in the state eligible for primary aid, allowing policymakers to eliminate the minimum aids to wealthy school districts. This level of funding applied to the first $1000 of spending (shared cost), making all districts in the state eligible for equalization aid. The secondary and

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72. *Id.* at 317.
73. *Id.*
75. *Id.* at 501–02.
76. See *id.* at 501.
77. See *id.* at 502.
78. See *id.* at 501.
tertiary levels functioned similarly to what the two-level formulas had previously, including the generation of negative aids for districts whose level of spending exceeded the secondary cost ceiling and whose property tax base exceeded the guarantee.\textsuperscript{79}

A review of the changes in the school aid formula over the past half century points out some consistencies in purpose. The current Wisconsin statute contains the general purpose of state funding as follows:

It is declared to be the policy of this state that education is a state function and that some relief should be afforded from the local general property tax as a source of public school revenue where such tax is excessive, and that other sources of revenue should contribute a larger percentage of the total funds needed. It is further declared that in order to provide reasonable equality of educational opportunity for all the children of this state, the state must guarantee that a basic educational opportunity be available to each pupil, but that the state should be obligated to contribute to the educational program only if the school district provides a program which meets state standards. It is the purpose of the state aid formula set forth in this subchapter to cause the state to assume a greater proportion of the costs of public education and to relieve the general property of some of its tax burden.\textsuperscript{80}

First, this statement affirms that education is a state function. This acknowledgement is followed by several public policy goals. They can be outlined as follows:

(1) Educational Opportunity: \textit{"It is further declared that in order to provide reasonable equality of educational opportunity for all the children of this state, the state must guarantee that a basic educational opportunity be available to each pupil . . ."}\textsuperscript{81}

\textsuperscript{79} See id. at 502.

\textsuperscript{80} Wis. Stat. § 121.01 (2003–2004).

\textsuperscript{81} Id. (emphasis added).
(2) State Educational Standards: “[T]he state should be obligated to contribute to the educational program only if the school district provides a program which meets state standards.”

(3) Level of State Funding: “It is the purpose of the state aid formula set forth in this subchapter to cause the state to assume a greater proportion of the costs of public education . . . .”

(4) Property Tax Relief: “[T]hat some relief should be afforded from the local general property tax as a source of public school revenue where such tax is excessive, and that other sources of revenue should contribute a larger percentage of the total funds needed” and “to relieve the general property of some of its tax burden.”

(5) Distribution of State Funds: “[T]hat some relief should be afforded from the local general property tax as a source of public school revenue where such tax is excessive.”

The appearance of this statement of purpose at the beginning of the chapter in state law that defines specific areas of state aid and the parameters for its distribution acknowledges the need for state intervention in the form of both state standards and financial support to protect the interests of every pupil in the state. The commitment to a high level of state support was, during the mid-1990s, defined as 66.7%. While a specific level of state funding is no longer defined in the statute, it would appear that policymakers remain committed to a substantial level of state support.

A number of public policy changes occurred in the 1990s that appear to be consistent with this statement of purpose. This study examines patterns of local spending and taxing that occurred before and after two of these changes. They include the introduction of three levels of state sharing through the equalization aid formula, as opposed to two, along with the imposition of state-imposed revenue controls.

The following questions are examined as they relate to these changes in state policy:

82. Id. (emphasis added).
83. Id. (emphasis added).
84. Id. (emphasis added).
85. Id. (emphasis added).
(1) Did the changes in the equalization aid formula (from two to three tiers) bring district spending closer together or further apart?

(2) Did the changes in the equalization aid formula (from two to three tiers) serve as a deterrent or incentive for increased own source spending?

(3) Did the imposition of and subsequent changes to the state-imposed revenue limits bring district spending closer together or further apart?

(4) Given these findings, what considerations should be included in current public policy debates over school funding issues?

In a 1992–1993 publication, the DPI indicated that "[s]tate law provides for two levels of state support, and therefore, two guaranteed valuations—one for 'low' costs and one for 'high' costs." From the historical review, it would appear that the public policy intent behind the second tier of a two-level, state aid formula was to create a disincentive effect for higher spending districts. Clearly, districts spending above the primary cost ceiling, regardless of wealth (tax base value), received a lower amount of state support for those expenditures. Wealthier districts spending above that threshold but having more tax base than the formula guaranteed were further penalized due to negative secondary aids that reduced the amount of primary aids received.

The three-tier formula, which was implemented in 1996–1997, operates the same way between the second and third levels. Because the first (primary) level of aid deals with only the first $1000 in spending, all districts spent more than this amount; therefore, they incurred secondary costs. Granted, a few of the very wealthiest Wisconsin school districts have tax bases that exceed even the primary guarantee (currently set statutorily at $1.93 million) and are only eligible for special adjustment aid. There are also some districts with tax bases under the primary guarantee but over the secondary level. These districts are held harmless under current law and receive the amount of aid generated in the first tier, even though, in some cases, the amount of

88. ROSSMILLER, supra note 39, at 3.
89. See WIS. STAT. § 121.07(6)(b) (2003–2004); KAVA & MERRIFIELD, supra note 70, at 9.
negative secondary aid would more than eliminate their primary aid.\textsuperscript{91} Hence, the typical and vast majority of districts in Wisconsin have property values that fall either between the secondary and tertiary guarantees or over the tertiary guarantee but not so much so that they do not enjoy both primary and secondary state aid. A combination of local characteristics and state aid factors directly influence an individual school district's eligibility for state equalization aid.

Several local characteristics that affect a district's eligibility for state aid include its level of spending, its wealth or ability to raise taxes (measured in terms of local property tax base), and its number of pupils (members, because the pupil head count is converted to a full-time equivalent membership for state aid purposes). In both the state aid and revenue limit formulas, the number of pupils enrolled is the single most critical variable because spending, revenue, and tax base are all evaluated in the formulas on a per-pupil basis.\textsuperscript{92} Hence, the more pupils a district enrolls, the lower the tax base, spending (shared cost), and revenue are on a per-pupil basis, and the greater are state aid and allowable revenues. Yet the degree to which local districts have control over these conditions may vary.

Local districts have little control over shifts in equalized valuation, although local school and municipal officials can work together in managing local growth with school enrollments in mind. Housing patterns, in turn, may influence the number of young families settling or remaining in a community. There are, of course, variables (such as economic growth and the job market) over which local educators may have little or no influence and these may impact local population patterns as well.

If a district's pupil count increases, whether due to local economic trends or through local educational initiatives or both, a district is able to raise revenues and spend at a higher rate. The ability to raise additional revenue allows a district to spend more, given the state-imposed revenue limits, compared with districts whose enrollment is stable or even declining. In addition, the level of local spending directly affects state sharing of local costs. Where state sharing increases, the local effort required for that additional spending may actually decrease, depending on the relationship between increased spending, the pupil count, and how a district is situated in the formula. Figure 1 depicts the

\textsuperscript{91} See generally KAVA & MERRIFIELD, supra note 70, at 9–10.

\textsuperscript{92} See generally WIS. STAT. § 121.07 (2003–2004).
three levels of sharing contained in the 2001-2002 Equalization Aid Formula.

Here are the ways that districts may be affected, based upon where their spending and property values fall in the state aid formula:

- Spending & Tax Base Within the Secondary Level

A district with spending and overall property value falling within the secondary range could increase its spending within the secondary level of sharing and enjoy increased state aid at the same ratio as all of its previous secondary costs. Hence, all new spending would be funded between the state and local taxpayers just the same as all previous costs.

- Secondary Spending Crossing into Tertiary Spending with Tax Base Less Than the Tertiary Guarantee

If a district's spending goes from the secondary to the tertiary level, yet its property value remains less than the tertiary guarantee, it would also receive additional state sharing, but at a lower ratio for those costs that exceed the secondary cost ceiling. As a result, the taxpayers would pay for a larger share of the new spending than they did of the original costs (or any remaining at the secondary level).

- Increased Tertiary Spending with Tax Base Less Than the Tertiary Guarantee

If a district's spending increases within the tertiary level, yet its property value remains less than the tertiary guarantee, it would also receive additional state sharing with all new costs being shared at the lower ratio produced by dividing the district's equalized value per pupil by the state's tertiary guarantee. Here, the taxpayers would continue to carry the same liability for all new spending that they had previously for that portion of spending falling above the secondary cost ceiling.

- Secondary Spending Crossing Into Tertiary Spending with Tax Base Greater Than the Tertiary Guarantee

If a district's spending goes from the secondary to the tertiary level, yet its property value is greater than the tertiary guarantee, it would create negative tertiary aids that would offset a portion of its secondary
aids, thus lowering overall aids. In this case, the local taxpayers would bear the total cost of all new spending in addition to assuming responsibility for a greater portion of original costs.

- **Tertiary Spending with Tax Base Greater Than the Tertiary Guarantee**

  If a district's spending increases within tertiary costs and its property value exceeds the tertiary guarantee, the amount of negative tertiary aid would increase with the net aid eligibility decreasing. Again in this case, local taxpayers would pay for the new costs plus more of the original level of spending.

  Once again, it should be noted that districts with increases in tax base, pupils, or both, either in relation to their spending increase or in relation to other districts, or the statewide average, will experience increased secondary aids. This can serve to increase the district's ratio of sharing whether costs go up measurably or not. Such increases in tax base or pupil counts may also mitigate the impact of negative aids. So, while the state aid formula contains a built-in disincentive for higher spending through the lower ratio of sharing of tertiary costs, as well as the potential for negative aids, districts may experience enhanced aids while increasing costs, depending on how all three of the variables interact with one another.

  In addition to changes in the local variables, state factors in the state aid formula also impact a school district's state aid eligibility. These fall into two categories: (1) the levels of the guarantees provided at each of the three levels; and (2) the amount of the cost ceilings (thresholds) that divide primary and secondary costs and secondary and tertiary costs. Table 1 outlines these factors as they were defined in the two years considered in this study.

  A review of the statutory language between the two-tier formula in 1993–1994 (original) and the three-tier formula in 2001–2002 (revised) reveals several similarities. Both formulas are designed to equalize tax efforts across school districts through setting guaranteed amounts of property value behind each pupil in the state and then comparing the local value to those guarantees to establish a ratio of sharing.\(^9\) Both

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formulas contain multiple tiers with a built-in disincentive for higher
own-source spending.\textsuperscript{94}

The obvious difference between the formulas is the number of tiers. In spite of the additional tier, equalization continues to occur at each level, and both are designed to fully distribute the amount of the state aid appropriation provided in the state budget.\textsuperscript{95} In the original formula, the primary guarantee is adjusted to whatever dollar amount facilitates that full distribution, while it is the secondary guarantee that is used for this purpose in the revised version.\textsuperscript{96} Hence, it is the other formula factors that deserve more attention, as they are the ones for which definitions were changed by policymakers in the process of making revisions to the formula. These represent some of the more subtle changes that affect how the local variables interact with the formula to produce the level of state sharing for individual local districts.

The cost ceilings are used to define the levels of spending in each tier. Only one such ceiling or threshold was needed in the original formula.\textsuperscript{97} The amount of this ceiling was "set by law, usually as part of the state's biennial budget, and [was] usually related to the state average shared cost per member."\textsuperscript{98} At other times, as was the case in 1993–1994, the statute directed that the amount used the previous year be modified by applying the rate of inflation in subsequent years.\textsuperscript{99}

The revised formula needed two ceilings in order to identify costs to be shared at each of the three levels.\textsuperscript{100} The first threshold, the primary cost ceiling, was set at $1000.\textsuperscript{101} This coincided with the establishment of a very high guaranteed value that exceeded the value of nearly all Wisconsin school districts at the time.\textsuperscript{102} This combination of factors


\textsuperscript{97} Wis. Stat. § 121.07(b) (1993–1994).


\textsuperscript{100} Wis. Stat. § 121.07(6)(b), (d) (2001–2002).

\textsuperscript{101} Id. § 121.07(6)(b).

amounted to a deliberate policy decision to make every district in the state eligible for some general state aid on an equalized basis. The change allowed policymakers to eliminate the unpopular flat aids that previously existed for just the wealthiest districts.

The secondary cost ceiling then had to be set to divide costs between the second and third levels of sharing. This ceiling was determined to be a calculated amount each year set at 90% of the previous year’s state average shared cost. A comparison between the primary cost ceiling in the original formula and the secondary cost ceiling in the revised formula shows that one was based upon (or adjusted with inflationary increases from) the state average shared cost per pupil while the other was calculated using 90% of the state average. The effect of this change on local school districts has been to force more costs into the tertiary level. This results in those costs being shared at a lower ratio by the state. In spite of the higher level of sharing provided for the first $1000 of spending (in the first tier of the new formula), the lowering of the threshold for spending at the upper end serves as a further disincentive for higher spending.

Considering the impact that state public policy decisions have on local districts, it is also interesting to note that in the 1970s the primary cost ceiling vacillated between 105% and 110% of the state average. It would appear, then, that state legislatures have over several decades made a conscious effort to strengthen the disincentive for higher spending by lowering the higher cost ceiling, thereby placing more and more costs into the higher and lower state-supported portion of the formula. The result has been that more districts have found themselves in tertiary spending with lower ratios of state support for those costs, with more of those districts incurring negative tertiary aids.

103. See RESCHOVSKY, supra note 10, at 3.
107. KINGSTON, supra note 27, at 210.
108. See id. (noting the variation of the cost ceiling as 105% to 110% of state average net cost); see also WIS. STAT. § 121.07(6)(d) (2001–2002) (showing a formula for the cost ceiling as 90% of the state average cost).
The addition of the $2 million (since changed to $1.93 million) guaranty for the first $1000 in spending in the revised formula has been discussed. A further comparison can be made, however, between the other guaranteed values (those used to determine the ratio of sharing for higher spending) set in the two formulas. For this purpose, the secondary guaranteed value per member in the original formula is comparable to the tertiary guaranteed value in the revised formula. Yet, the original formula defined this guarantee as equal to 106% of state average equalized property value per member, while the revised tertiary value was based on 100% of the statewide average. The result has been less state sharing of higher costs, with local taxpayers paying a higher portion of those costs. Once again, this result created an even greater disincentive for higher own-source spending while, at the same time, pushing more districts into tertiary or even negative tertiary situations solely due to the change in state-level policy.

Additionally, changes in the definition of shared cost by the state affect local state aid eligibility. Historic changes in the areas of capital costs or debt retirement certainly affect property taxes and, therefore, may influence local spending decisions. For example, through the 1980s, debt retirement (long-term principal and interest payments) was included in shared costs only up to a maximum of $90 per student. Since 1990–1991, all debt retirement costs have been included in shared costs, thereby providing state sharing (based upon where a district’s overall spending falls in either the two or three-tiered formulas).

C. Revenue Caps in Wisconsin

In anticipation of the major increase in state aid (two-thirds) that was promised to be provided in 1995–1996 and to ensure that property tax relief would result from this influx of new state money, the Wisconsin legislature imposed limits on annual school district revenue growth beginning in 1993. The limits included property taxes and state aid, which combined account for more than 80% of a district’s total

113. See infra Part III.
115. Id. at 102–03.
revenue. Initially established annually by the legislature, current school district revenue limits are adjusted annually by the rate of inflation. In the 2004–2005 school year, district revenue growth was capped at $241.01 per pupil.

The basis for the revenue caps in 1993 was the actual amount of spending per pupil in each school district in 1992–1993. School districts were then allowed to increase their controlled revenues by $190 per pupil, or they could apply the then-current rate of inflation ("CPI") to the prior year spending base. The inflation rate at that time was 3.2%; hence, while the majority of districts in the state applied the flat dollar increase, the highest spending ones were able to increase their caps by 3.2%, which amounted to as much as $355 in the highest spending district. The initial revenue caps that resulted across the state in 1993–1994 ranged from $4117 per pupil in the Waterford J1 School District and $4116 in the lowest spending K–12 district, to $10,294 in the Nicolet UHS district, $6767 in Shorewood, and $7778 in the highest spending K–12 district.

The second year of the cap (1994–1995) functioned in the same way. Districts could either apply the flat dollar increase of $194.37 or they could take the current rate of inflation (2.3%) multiplied by their base revenue per member, based on the amount levied the previous year up to the maximum allowable for that year. Again, this created higher dollar increases for the higher spending districts that ranged from $194.37 to $255 per pupil.

By the third year of the caps, 1995–1996, through 1995 Wisconsin Act 27, the state changed the method of calculating the annual allowable increase for all districts. Rather than offering the option of

117. KAVA & MERRIFIELD, supra note 70, at 3.
121. Id.
122. KAVA & OLIN, supra note 119, at 2.
123. BASIC FACTS 1993–1994, supra note 102, at 139.
124. Id. at 107.
125. Id. at 126.
126. Id. at 134.
127. Id. at 110.
128. KAVA & OLIN, supra note 119, at 2–3.
129. See id.
taking the flat dollar increase or applying the rate of inflation to the prior year's base, the legislature determined that all districts would be treated alike. Hence, from that time forward, a flat dollar amount was identified each year (tied to the rate of inflation) by which all districts would be permitted to raise the controlled revenues. The history of the annual increments is identified in Table 2.

In addition to adopting a uniform annual increment, the legislature, through 1995 Wisconsin Act 27, also provided greater flexibility for low spending districts. A low spending minimum was established, beginning in 1995-1996, that allowed districts spending below that threshold to increase their annual revenues beyond the amount of the annual increment to the amount needed to bring their spending up to that threshold. The historical amounts of these thresholds are provided in Table 3. Twenty-nine districts were eligible for the low revenue bump in 1995-1996. While the allowable increase per pupil in that year was $200 for all districts, these districts were allowed to exceed that amount enough to bring total revenues up to the $5300 low spending threshold set for that year. An indicator of how much below the spending of other districts this group was is the fact that the total of the standard per pupil increase ($200) for this group of twenty-nine districts was $5800. While the additional per-pupil amounts allowed ranged from $10.63 in Wild Rose to $567.79 in Campbellsport, the average additional increase for these districts was $178.16 and the aggregate per-pupil amount for this group of districts was $5166.59, an amount very close to the aggregate original allowable increase of $5800.

By 2001-2002 the number of districts eligible for the low revenue adjustment had declined to four from among the original set of districts. The per-pupil adjustment amounts ranged from $10.57 to $242.38, with an average for the group of $120.27 and an aggregate per-pupil amount of $481.09. These amounts were, again, in addition to

131. See id. at 504-05.
132. Id.
133. See id.
134. Id.
135. See infra Table 4.
137. See infra Table 4.
138. Id.
139. Id.
140. Id.
the $226.68 base revenue limit increase allowed for all districts in 2001-2002; the aggregate for these four districts was $906.72.\textsuperscript{141}

The reduction from twenty-nine districts being eligible for the low revenue adjustment in 1995-1996 to four in 2001-2002 and the reduction in the allowable per-pupil amounts for each of the four remaining eligible districts demonstrate that every one of the districts able to take advantage of this opportunity to raise additional revenues has done so. Considering that the state revenue cap policy in 1994-1995 did not contain such a provision helps explain the degree to which spending increased over the term of this study. It is also worth noting that in the 1994-1995 school year, 35% (149 of 426 districts) of the school districts did not raise revenues to the allowable limits.\textsuperscript{142} In 2001-2002, the percentage had dropped to 24% (n=101).\textsuperscript{143}

The principle exemption to the revenue limits is if a district successfully passes a referendum for either capital projects or operations expenses.\textsuperscript{144} If a bonding referendum is approved by the voters, the annual debt service payments are exempt from the revenue limits.\textsuperscript{145} If the referendum is specifically for the purpose of exceeding the revenue limit, it must specify whether the time period by which to exceed the limit is fixed or indefinite.\textsuperscript{146}

Between 1991 and April 2004, there were 1901 referenda questions presented to voters throughout the state.\textsuperscript{147} Of those, 1343 were for capital projects (new construction, remodeling, sports facilities, etc.) and 536 sought to exceed the revenue limits.\textsuperscript{148} Capital projects, in general, had a much greater chance of passing when compared to questions to exceed the spending caps (54% versus 40% success rates).\textsuperscript{149}

\begin{itemize}
  \item 141. Id.
  \item 142. Id.
  \item 143. Id.
  \item 144. See Wis. Stat. § 121.91(3)(a) (2003–2004).
  \item 145. Id. § 121.91(4)(c).
  \item 146. Id. § 121.91(3)(a).
  \item 148. Maher & Skidmore, supra note 147, at 8.
  \item 149. See generally id.; Wisconsin Taxpayers Alliance, supra note 147; Wisconsin Department of Public Instruction, supra note 147; U.S. Census Bureau, supra note 147.
\end{itemize}
As shown in an earlier study, the number and success of referenda was affected by state policy, particularly the state's commitment to fund two-thirds of school costs beginning in 1996–1997. In 1993–1994, 129 separate referenda questions for bonding purposes were submitted to voters, totaling $751 million dollars, and 52% were successfully passed. In fiscal year 1995, the number of bonding referenda was 128, totaling $901 million, and 55% passed. In fiscal year 1996, the number of capital-related projects jumped to 164 referenda, totaling $1.24 billion, and 63% won voter approval. Similarly, in fiscal year 1997, 147 bonding-related referenda questions, totaling $1.19 billion, were introduced, and 58% were successful. So, in both the number of bonding referenda and success rates, the period surrounding the state's two-thirds commitment witnessed a dramatic increase in local and state costs for bonding projects.

III. INCENTIVES CREATED BY CHANGING POLICIES

The previous discussion highlights the key elements of school finance reform in Wisconsin. Hoxby shows clearly that school finance equalization efforts have led to significant changes in school funding across the states, and the same is true for Wisconsin. However, it is important to note that in addition to the level of funding provided by the state, changes in the revenue limit and state aid formulas generated incentives to either increase or reduce own-source spending.

How the changes in the state funding formula affect local school district spending choices may depend in part on the tax price faced by the school districts. The tax price, which is the cost to a school district of increasing spending by an additional dollar, depends on how state aid is distributed to the school districts. In Wisconsin, the tax price changed significantly for many school districts as a result of the 1996–1997

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150. See generally Maher & Skidmore, supra note 147; Wisconsin Taxpayers Alliance, supra note 147; Wisconsin Department of Public Instruction, supra note 147; U.S. Census Bureau, supra note 147.
152. See generally Maher & Skidmore, supra note 147; Wis. Department of Public Instruction, Referendum Information, supra note 151.
153. See generally Maher & Skidmore, supra note 147; Wis. Department of Public Instruction, Referendum Information, supra note 151.
154. See generally Maher & Skidmore, supra note 147; Wis. Department of Public Instruction, Referendum Information, supra note 151.
155. Hoxby, supra note 5, at 1189.
reform. Prior to the change in the state aid formula, the tax price faced by a school district depended on per-pupil equalized valuation. However, for districts above the state average per-pupil property value, state aid was reduced when a school district increased its own-source spending effort, creating a disincentive effect. That is, the state aid formula tended to discourage spending for these districts. 

Ironically, the wealthier districts that received no equalization aid experienced no change in incentives.

Following the 1996–1997 reform, the tax price in a given school district still depended on per-student property valuation, but the tax prices, and thus incentives for own-source spending, changed considerably. As outlined in greater detail below and as illustrated by Andrew Reschovsky, in 2001–2002 the tax price faced by a few of the wealthiest school districts (those with per student property values in excess of $903,569) equaled one. For school districts with per student property valuations between $325,154 and $903,569 and per-pupil spending greater than $6848, the tax price is greater than one. For these school districts, an additional dollar of spending requires more than a dollar of own-source funding because state aid declines as own spending effort increases. However, for school districts with per-pupil property valuation less than $325,154, the tax price is less than one. For these school districts an increase in spending of one dollar requires less than a dollar of own-source spending because school aid increases with increases in own-spending effort. The appendix provides detailed information on how to calculate the tax price for each school district in Wisconsin in the pre-reform (1994–1995) and post-reform period.

While the tax price, in principle, is a fundamental factor that may play a role in spending decisions, perhaps the imposition of revenue caps is even more important in practice. This is so because what a district is allowed to spend in future years is affected by the prior year’s spending decisions. Failure to increase own-source revenues to the extent allowed under the revenue cap effectively limits spending in all
subsequent years. The nature of the cap provided an incentive to increase revenues, spending, or both by the fullest amount possible. 164

In the next Part, we evaluate the degree to which changing state aid formulas and revenue cap policies have altered spending in school districts across the state.

IV. EMPIRICAL ANALYSIS

The estimation approach uses as the independent variable $\Delta S_i$ where $\Delta S_i$ is defined as the real change in per pupil spending for school district $i$ over the 1995–2002 period:

$$\Delta S_i = \Delta X_i \gamma + \mu_i(1)$$

where $\Delta X_i$ represents a set of independent variables that are assumed to determine changes in per pupil spending, $\gamma$ is a vector of coefficients, and $\mu_i$ is the error term. We estimate the change in per-pupil spending as opposed to the level of spending because we hope to identify whether or not the policy changes that occurred in 1996–1997 had an impact on spending patterns and the distribution of resources across the state. Estimating this first-difference equation better isolates the effects of the policy changes and may reduce concerns about endogeneity. 165

Our primary focus is to estimate the impact of changes in the school finance formula and the impacts of revenue caps on spending decisions across the state. To that end, in this analysis, two primary independent variables are per-pupil state equalization aid and the inverted tax price. As described by Hoxby, school finance schemes have two effects: an income effect and a price effect. 166 Changes in per-pupil state equalization aid accounts for the changes in funding from the state, which may affect school district overall spending levels. In addition, the inverted tax price variable indicates how much an additional dollar of spending will cost the

164. Policymakers recognized this issue and over the term of the revenue caps have provided means for school districts to recover portions of potential revenues that had not been realized in the prior year. See WIS. STAT. § 121.91(4)(d) (2003–2004).

165. Econometric analysis can be hampered by simultaneity. For example, the level of per-pupil spending depends in part on the state aid formula. But the state aid depends in part on how much a school district decides to spend. This simultaneity can lead to biased coefficient estimates. However, with the significant, arguably exogenous, change in the school finance equalization formula, we can estimate the effect of the change in policy on the change in spending. This approach allows us to isolate the effect of changing policy on spending patterns.

166. Hoxby, supra note 5, at 1228.
school district in own-source revenues. As previously described, for poorer districts an additional dollar of spending will cost less than a dollar of own-source revenues, and for a wealthier district an additional dollar of spending will cost more than a dollar of own-source revenue. Thus, poorer districts have an incentive to increase spending, and wealthier districts have an incentive to reduce spending.

A secondary focus of this paper is the impact of school district referenda activity on the extent to which school district expenditures and tax rates are converging. One way that a school district may circumvent attempts by the state to limit spending is via the referenda process. Earlier work by Maher and Skidmore shows that following the state's assumption of two-thirds of school costs and changes to the equalization aid formula, poorer districts had better success in passing bonding referenda. The question here is whether successful referenda passage, both for bonding and exceeding the revenue cap, affected changes in school district spending and tax rates. We therefore include as explanatory variables per-pupil dollars of successful bonding referenda over the 1996-2001 period, and the per-pupil amount of dollars approved by voters to exceed the revenue cap.

We also hope to evaluate whether the disparity across districts in spending was reduced by the changes in school finance policy. Thus, in addition to estimating a regression using all school districts, we also estimate two additional regressions: one for low per-pupil wealth districts and one for high per-pupil wealth districts as defined in the initial period of analysis. This approach allows us to examine whether spending in poor districts is coming up or spending in wealthy districts is coming down as a result of changes in the state aid formula.

To isolate the effects of changing policy, we also control for factors that may affect changes in per-pupil spending levels. In our regression analysis we include the following variables as controls: change in poverty rate, change in per-pupil equalized valuation, and change in the proportion of school-age children in the population. We expect that as the poverty rate increases, per-pupil spending will fall, and as per-pupil property valuation and the proportion of school-age children in the population increase, per-pupil spending will also increase.

Given that the courts in Wisconsin have interpreted the uniformity clause to mean that school districts ought to have roughly equivalent tax

167. Maher & Skidmore, supra note 147, at 17.
effort, one goal of the state has been to reduce the disparity across the state in property tax rates. We therefore also estimate a regression in which the change in the mill rate is the dependent variable:

$$\Delta r_i = \Delta X_i \gamma + \mu_i(2)$$

where $r$ is the school district mill rate and $\Delta X$ represents a series of variables thought to determine changes in tax rates across school districts. Again, our two primary variables of interest are per-pupil state aid (income effect) and the inverted tax price (price effect). We include the same series of variables above as controls, and we estimate three regressions: a regression that uses data from all school districts; a regression that uses data from just low-spending districts (bottom half of all school districts); and a regression that uses data for high spending districts (top half of all school districts), as defined in the initial period of analysis.

Summary statistics for all variables used in the analysis are presented in Tables 5 and 6. Table 5 includes summary statistics for all districts, as well as for high-spending (above average) and low-spending (below average) districts. Table 6 provides summary statistics for high property tax rate (above average) and low property tax rate (below average) school districts. Note in Table 5 that per-pupil state equalization aid increased $1545 overall with the largest increase (about a $500 differential) going to the lower spending districts. Also, consistent with our earlier work, the amounts of approved bonding referenda vary substantially between low- and high-spending districts ($6088 per pupil versus $3829 per pupil).

We now turn to a discussion of our estimation results in Table 7, which are generated using ordinary least squares regression analysis. The adjusted $R^2$ indicates that 33% to 51% of the variation in changes in per-pupil spending is explained in our regressions. Similarly, the property tax rate regressions explain from 29% to 35% of the variation in property tax rates. The overall performance of the regressions is reasonably strong for a first-differenced cross-sectional analysis. Consider the coefficient estimates in the per-pupil spending equation on our two primary policy variables: change in state aid and change in inverted tax price. According to these estimates, on average an additional dollar of state equalization aid increases spending by $0.33 on average. However, state aid appears to

168. See Vincent v. Voight, 2000 WI 93, ¶¶ 3–4, 6, 236 Wis. 2d 588, ¶¶ 3–4, 6, 614 N.W.2d 388, ¶¶ 3–4, 6; Buse v. Smith, 74 Wis. 2d 550, 557, 247 N.W.2d 141, 155 (1976).
169. See Wis. STAT. § 121.01 (2003–2004).
have increased spending in low-spending districts more so than high-spending districts. The regressions show that in low-spending districts every dollar of state aid increases spending by $0.68, but there is no effect in the high-spending districts. Note, however, that increases in state aid do not lead to dollar-for-dollar increases in spending, and in fact increases in aid actually reduce tax rates, especially in low rate (high-spending) districts.

Increases (or reductions) in the inverted tax price have led to increases (or decreases) in spending. These estimates show that an increase (decrease) in the inverted tax price of 0.1 increases (reduces) spending by $31 per pupil. The tax rate regressions also show that increases (reductions) in the inverted tax price served to decrease (increase) tax rates, and this is particularly true for high tax rate districts. Thus, while the net increase in state aid in low income districts has served to increase overall spending at $0.68 per dollar and reduce property tax rates, the effect is offset by reductions in the inverted tax prices resulting from the changes in the state aid formula. On the other hand, changes in school finance appear to have had a much smaller effect on spending in high-spending and low rate districts. Taken together, net changes in funding along with changes in the revenue limit appear to have served to reduce spending disparities across school districts by bringing spending up in low-spending districts, but had little impact on spending in high-spending districts. These results also suggest that altering the state aid formula in such a way as to make the tax price more favorable might further reduce disparities in spending across school districts.

Perhaps not surprisingly, school district referenda activity is significantly related to both changes in spending and tax rates. For every $1 change in successful bonding referenda activity, spending through debt service increases by $0.03. Interestingly, the impacts of these referenda appear to vary between low- and high-spending districts by over three and a half cents per pupil. While this may not appear to be substantial, remember that the average bonding referendum was over $5000 per pupil.

Looking at successful referenda to exceed revenue caps, the impact appears to be significant for low-spending districts but insignificant for high-spending districts. This result suggests that, at least with respect to these types of referenda, successful passage has contributed to the convergence of school district spending. An additional effect of the policy allowing referenda to exceed revenue caps has been a reduction in the growth of tax rates for high-tax rate districts more so than for districts with lower tax rates.
Before turning to our conclusions, we first provide a brief review of the coefficient estimates on the control variables. Generally, the control variables have the expected signs. Increases in tax rates and per-pupil equalized valuation increase spending. Increases in poverty reduce per-pupil spending, and increases in school age population increase per-pupil spending. However, changes in percent rural do not significantly affect per-pupil spending or tax rates. These estimates are generally consistent with previous studies and thus provide some confidence that our primary variables of interest (change per pupil, state aid, inverted tax price, and referenda for bonding and exceeding revenue caps) generate reasonable coefficient estimates.

V. CONCLUSIONS

The changes in Wisconsin’s education finance system appear to have reduced disparities in per-pupil spending, but perhaps surprisingly, disparities in local tax effort (as measured by property tax rates) have increased. Increased state aid has translated into increased spending in lower spending districts and tax relief in higher spending and higher wealth districts. The modest change in tax price appears to have reduced spending and increased tax rates in lower spending districts, but also to have had little impact on either spending or tax rates in high-spending districts. Finally, both low- and high-spending districts have increased spending and tax effort when they can successfully pass a referenda measure.

The infusion of state aid, the manner in which those aids were distributed to school districts, and revenue caps gave the state significant control over school district fiscal policy. A key release valve afforded to school districts by the state has been the referenda process. Within the context of spending and tax effort, successful referenda have had mixed results. Approved bonding referenda led to greater spending growth by already high-spending districts when compared to low-spending districts. On the other hand, passage of referenda to exceed revenue caps appears to have increased spending in lower spending districts more so than high-spending districts. This, of course, suggests that the referenda process has, to some degree, allowed school districts to retain local control.

The empirical analysis presented here indicates that Wisconsin’s most recent changes in education finance have not reduced disparities in tax effort if one defines tax effort by property tax rates. Rather, tax rate disparities have increased since reform. In short, property tax relief has
been distributed primarily to the wealthy, not necessarily to those facing the highest relative property tax burdens. On the other hand, disparities in per-pupil spending appear to have been reduced as a result of the policy changes. As policymakers once again consider the nature of education finance in Wisconsin, they may find this analysis useful.
FIGURE 1
LEVELS OF SHARING IN THE 2001–2002 EQUALIZATION AID FORMULA

170

$14,000
$13,000
$12,000
$11,000
$10,000
$9,000
$8,000
$7,000
$6,000
$5,000
$4,000
$3,000
$2,000
$1,000
COSTS

PGVM = $1,930,000
PRIMARY GUARANTEE

SGVM = $903,569
SECONDARY GUARANTEE

SECONDARY COST CEILING = $6,848

TGVM = $352,154
TERTIARY GUARANTEE

PROPERTY TAX BASE

170. Reschovsky, supra note 10, at 11.
## TABLE 1
**Comparison of Statutory Basis for State Factors in Equalization Aid Formula**

<table>
<thead>
<tr>
<th>Aid Year</th>
<th>State Aid Factor</th>
<th>Statutory Definition and Amount in Given Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994–1995</td>
<td><strong>Primary Guaranteed Value per Member (PGVM)</strong></td>
<td>Section 121.07(7)(a): “The ‘primary guaranteed valuation per member’ is an amount, rounded to the next lowest dollar, that, after subtraction of payments under [various sections], fully distributes the sum of the amount remaining in the appropriation under s. 20.255 (2)(ac).”[^1] [357,837]</td>
</tr>
<tr>
<td></td>
<td><strong>Primary Cost Ceiling (PCC)</strong></td>
<td>Section 121.07(6)(b) of the statutes was repealed and recreated to read: “The ‘primary ceiling cost per member’ shall be the amount determined by multiplying the primary ceiling cost per member in the previous school year by the rate certified under s. 73.03 (46) [consumer price index] and adding the result to the primary ceiling cost per member in the previous school year.”[^2] [5617]</td>
</tr>
<tr>
<td>2001–2002</td>
<td><strong>Secondary Guaranteed Value per Member (SGVM)</strong></td>
<td>In 1994, section 121.07(7)(b) defined the SGVM as equal to 106% of the statewide average equalized property value per member rounded to the next lowest dollar.[^3] [216,457]</td>
</tr>
<tr>
<td></td>
<td><strong>Primary Guaranteed Value per Member (PGVM)</strong></td>
<td>Section 121.07(7)(a): “The ‘primary guaranteed valuation per member’ is $1,930,000”[^4] (changed from $2,000,000).[^5] [1,930,000]</td>
</tr>
<tr>
<td></td>
<td><strong>Primary Cost Ceiling (PCC)</strong></td>
<td>Section 121.07(6)(b): “The ‘primary ceiling cost per member’ is $1,000.”[^6] [1000]</td>
</tr>
</tbody>
</table>

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### TABLE 1 (CONTINUED)

**COMPARISON OF STATUTORY BASIS FOR STATE FACTORS IN EQUALIZATION AID FORMULA**

<table>
<thead>
<tr>
<th>Aid Year</th>
<th>State Aid Factor</th>
<th>Statutory Definition and Amount in Given Year</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td></td>
<td>Secondary Cost Ceiling (SCC)</td>
<td>Section 121.07(6)(d) of the statutes was repealed and recreated to read: “The ‘secondary ceiling cost per member’ in the 2001-02 school year and in each school year thereafter is an amount determined by dividing the state total shared cost in the previous school year by the state total membership in the previous school year and multiplying the result by 0.90.” 178 [$6848]</td>
</tr>
<tr>
<td></td>
<td>Tertiary Guaranteed Value per Member (TGVM)</td>
<td>Section 121.07(7)(bm): “The ‘tertiary guaranteed valuation per member’ is the amount rounded to the next lower dollar determined by dividing the equalized valuation of the state by the state total membership.” 179 [$325,154]</td>
</tr>
</tbody>
</table>

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177. Id. § 121.07(7)(b).
178. Id. § 121.07(6)(d); 2001 Executive Budget Act, Act 16, 2001 Wis. Sess. Laws 549.
### TABLE 2
**REVENUE CAP-ALLOWED INCREASES**

<table>
<thead>
<tr>
<th>Revenue Cap Year</th>
<th>Allowable Incremental Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993-1994</td>
<td>$190 or CPI-u (3.2%) $190 -</td>
</tr>
<tr>
<td>1994-1995</td>
<td>$194.37 or CPI-u (2.3%) $194.37 -</td>
</tr>
<tr>
<td>1995-1996</td>
<td>$200</td>
</tr>
<tr>
<td>1996-1997</td>
<td>$206</td>
</tr>
<tr>
<td>1997-1998</td>
<td>$206</td>
</tr>
<tr>
<td>1998-1999</td>
<td>$208.88</td>
</tr>
<tr>
<td>1999-2000</td>
<td>$212.43</td>
</tr>
<tr>
<td>2000-2001</td>
<td>$220.29</td>
</tr>
<tr>
<td>2001-2002</td>
<td>$226.68</td>
</tr>
</tbody>
</table>

### TABLE 3
**REVENUE CAPS LOW SPENDING THRESHOLDS**

<table>
<thead>
<tr>
<th>Revenue Cap Year</th>
<th>Low Spending Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993-1994</td>
<td>-</td>
</tr>
<tr>
<td>1994-1995</td>
<td>-</td>
</tr>
<tr>
<td>1995-1996</td>
<td>$5300</td>
</tr>
<tr>
<td>1996-1997</td>
<td>$5600</td>
</tr>
<tr>
<td>1997-1998</td>
<td>$5900</td>
</tr>
<tr>
<td>1998-1999</td>
<td>$6100</td>
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<tr>
<td>1999-2000</td>
<td>$6300</td>
</tr>
<tr>
<td>2000-2001</td>
<td>$6500</td>
</tr>
<tr>
<td>2001-2002</td>
<td>$6700</td>
</tr>
</tbody>
</table>

---

TABLE 4
SCHOOL DISTRICTS ELIGIBLE FOR ANNUAL INCREASE

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ALMOND-BANCROFT</td>
<td>200</td>
<td>61.63</td>
</tr>
<tr>
<td>2</td>
<td>AMERY</td>
<td>200</td>
<td>37.38</td>
</tr>
<tr>
<td>3</td>
<td>AUBURNDALE</td>
<td>200</td>
<td>148.23</td>
</tr>
<tr>
<td>4</td>
<td>BERLIN AREA</td>
<td>200</td>
<td>229.41</td>
</tr>
<tr>
<td>5</td>
<td>CADOTT COMMUNITY</td>
<td>200</td>
<td>202.63</td>
</tr>
<tr>
<td>6</td>
<td>CAMERON</td>
<td>200</td>
<td>61.01</td>
</tr>
<tr>
<td>7</td>
<td>CAMPBELLSPORT</td>
<td>200</td>
<td>567.79</td>
</tr>
<tr>
<td>8</td>
<td>DENMARK</td>
<td>200</td>
<td>179.23</td>
</tr>
<tr>
<td>9</td>
<td>ELROY-KENDALL-WILTON</td>
<td>200</td>
<td>378.63</td>
</tr>
<tr>
<td>10</td>
<td>FENNIMORE COMMUNITY</td>
<td>200</td>
<td>68.13</td>
</tr>
<tr>
<td>11</td>
<td>HAYWARD COMMUNITY</td>
<td>200</td>
<td>118.64</td>
</tr>
<tr>
<td>12</td>
<td>IOLA-SCANDINAVIA</td>
<td>200</td>
<td>15.58</td>
</tr>
<tr>
<td>13</td>
<td>LUXEMBURG-CASCO</td>
<td>200</td>
<td>244.31</td>
</tr>
<tr>
<td>14</td>
<td>MARINETTE</td>
<td>200</td>
<td>129.58</td>
</tr>
<tr>
<td>15</td>
<td>MARION</td>
<td>200</td>
<td>29.63</td>
</tr>
<tr>
<td>16</td>
<td>MEDFORD AREA</td>
<td>200</td>
<td>175.17</td>
</tr>
<tr>
<td>17</td>
<td>OCONTO</td>
<td>200</td>
<td>138.63</td>
</tr>
<tr>
<td>18</td>
<td>OOSTBURG</td>
<td>200</td>
<td>0.64</td>
</tr>
<tr>
<td>19</td>
<td>PITTSVILLE</td>
<td>200</td>
<td>188.17</td>
</tr>
<tr>
<td>20</td>
<td>RAYMOND #14</td>
<td>200</td>
<td>294.37</td>
</tr>
<tr>
<td>21</td>
<td>RICE LAKE AREA</td>
<td>200</td>
<td>61.63</td>
</tr>
<tr>
<td>22</td>
<td>STANLEY-BOYD AREA</td>
<td>200</td>
<td>237.01</td>
</tr>
<tr>
<td>23</td>
<td>TOMAH AREA</td>
<td>200</td>
<td>312.58</td>
</tr>
<tr>
<td>24</td>
<td>UNION GROVE J1</td>
<td>200</td>
<td>148.61</td>
</tr>
<tr>
<td>25</td>
<td>WASHINGTON-CALDWELL</td>
<td>200</td>
<td>265.73</td>
</tr>
<tr>
<td>26</td>
<td>WATERFORD J1 (V)</td>
<td>200</td>
<td>694.4</td>
</tr>
<tr>
<td>27</td>
<td>WAUTOMA AREA</td>
<td>200</td>
<td>153.62</td>
</tr>
<tr>
<td>28</td>
<td>WILD ROSE</td>
<td>200</td>
<td>10.63</td>
</tr>
<tr>
<td>29</td>
<td>WINNECONNE COMMUNITY</td>
<td>200</td>
<td>13.59</td>
</tr>
<tr>
<td></td>
<td>Aggregate</td>
<td>$5,800</td>
<td>$5,166.59</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td></td>
<td>$178.16</td>
</tr>
</tbody>
</table>

182. Data files from Wisconsin Department of Public Instruction to the authors (Sept. 25, 2006) (on file with authors); Wis. Department of Public Instruction, School District Revenue Limits, http://dpi.wi.gov/sfs/revlim.html (last visited Mar. 30, 2007).
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CAMPBELLSPORT</td>
<td>226.68</td>
<td>136.76</td>
</tr>
<tr>
<td>2</td>
<td>OCONTO</td>
<td>226.68</td>
<td>242.38</td>
</tr>
<tr>
<td>3</td>
<td>UNION GROVE J1</td>
<td>226.68</td>
<td>10.57</td>
</tr>
<tr>
<td>4</td>
<td>WATERFORD J1 (V)</td>
<td>226.68</td>
<td>91.38</td>
</tr>
<tr>
<td>4</td>
<td>Aggregate</td>
<td>$906.72</td>
<td>$481.09</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td></td>
<td>$120.27</td>
</tr>
</tbody>
</table>
### Table 5
**Summary Statistics for Low and High Spending Districts**

<table>
<thead>
<tr>
<th></th>
<th>All School Districts</th>
<th>Low-spending Districts</th>
<th>High-spending Districts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Standard Dev.</td>
<td>Mean</td>
</tr>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real Change in Per Pupil Spending</td>
<td>2393.74</td>
<td>737.74</td>
<td>2501.44</td>
</tr>
<tr>
<td><strong>Independent Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in Mill Rate</td>
<td>0.0065</td>
<td>0.638</td>
<td>-0.0146</td>
</tr>
<tr>
<td>Change in State Aid</td>
<td>1545.45</td>
<td>716.71</td>
<td>1734.74</td>
</tr>
<tr>
<td>Change in Pct. Of Children in Poverty</td>
<td>-0.0099</td>
<td>0.015</td>
<td>-0.0100</td>
</tr>
<tr>
<td>Change in Real per Pupil Equalized Valuation</td>
<td>74.283</td>
<td>34.683</td>
<td>73.432</td>
</tr>
<tr>
<td>Change in School-Aged Children</td>
<td>-0.0035</td>
<td>0.022</td>
<td>-0.0058</td>
</tr>
<tr>
<td>Change in Inverted Tax Price</td>
<td>-0.0929</td>
<td>0.2298</td>
<td>-0.1116</td>
</tr>
<tr>
<td>Bonding Referenda per Member (1996–2001)</td>
<td>5186.88</td>
<td>5791.70</td>
<td>6088.58</td>
</tr>
<tr>
<td>Exceed Revenue Cap Referenda per Member (1996–2001)</td>
<td>178.65</td>
<td>474.43</td>
<td>178.96</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>421</td>
<td>253</td>
<td>168</td>
</tr>
</tbody>
</table>

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183. Data files from Wisconsin Department of Public Instruction to the authors, *supra* note 182; Wis. Department of Public Instruction, *supra* note 182.
### TABLE 6
**SUMMARY STATISTICS FOR HIGH AND LOW TAX RATE DISTRICTS**

<table>
<thead>
<tr>
<th></th>
<th>All School Districts</th>
<th>Low-Tax Rate Districts</th>
<th>High-Tax Rate Districts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Standard Dev.</td>
<td>Mean</td>
</tr>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in School District Tax Rate</td>
<td>0.0065</td>
<td>0.638</td>
<td>0.1346</td>
</tr>
<tr>
<td><strong>Independent Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in Pet. of Children in Poverty</td>
<td>-0.0099</td>
<td>0.015</td>
<td>-0.0084</td>
</tr>
<tr>
<td>Change in Real per Pupil Equalized Valuation</td>
<td>74.095</td>
<td>34.856</td>
<td>71.166</td>
</tr>
<tr>
<td>Change in School Aged Children</td>
<td>-0.0034</td>
<td>0.022</td>
<td>-0.0009</td>
</tr>
<tr>
<td>Change in Inverted Tax Price</td>
<td>-0.0914</td>
<td>0.232</td>
<td>-0.09</td>
</tr>
<tr>
<td>Bonding Referenda per Member (1996-2001)</td>
<td>5174.59</td>
<td>5790.33</td>
<td>5671.50</td>
</tr>
<tr>
<td>Exceed Revenue Cap Referenda per Member (1996-2001)</td>
<td>178.23</td>
<td>473.95</td>
<td>173.94</td>
</tr>
<tr>
<td>N</td>
<td>422</td>
<td>209</td>
<td>213</td>
</tr>
</tbody>
</table>

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184. Data files from Wisconsin Department of Public Instruction to the authors, *supra* note 182; Wis. Department of Public Instruction, *supra* note 182.
### TABLE 7

**WISCONSIN SCHOOL SPENDING REGRESSION ESTIMATES: 1995 AND 2002**

<table>
<thead>
<tr>
<th></th>
<th><strong>Dep. Var.: Change in Per Pupil Spending</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Full Sample</td>
</tr>
<tr>
<td>Constant</td>
<td>590.22 ***</td>
</tr>
<tr>
<td>Change in Tax Rate</td>
<td>331.844 **</td>
</tr>
<tr>
<td></td>
<td>(56.239)</td>
</tr>
<tr>
<td>Change in State Aid</td>
<td>0.337 ***</td>
</tr>
<tr>
<td></td>
<td>(0.059)</td>
</tr>
<tr>
<td>Change in Pct. Children in Poverty</td>
<td>-5929.8 ***</td>
</tr>
<tr>
<td></td>
<td>(2152.51)</td>
</tr>
<tr>
<td>Change in per Pupil Property Valuation</td>
<td>14.416 ***</td>
</tr>
<tr>
<td></td>
<td>(1.410)</td>
</tr>
<tr>
<td>Change in School-Aged Population</td>
<td>2264.5</td>
</tr>
<tr>
<td></td>
<td>(1500.39)</td>
</tr>
<tr>
<td>Change in Percent Rural</td>
<td>-52.09</td>
</tr>
<tr>
<td></td>
<td>(42.404)</td>
</tr>
<tr>
<td>Change in Inverted Tax Price</td>
<td>310.52*</td>
</tr>
<tr>
<td></td>
<td>(138.52)</td>
</tr>
<tr>
<td>Bonding Referenda per Pupil</td>
<td>0.031 ***</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
</tr>
<tr>
<td>Exceed Revenue Cap Referenda per Pupil</td>
<td>0.122*</td>
</tr>
<tr>
<td></td>
<td>(0.064)</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.330</td>
</tr>
<tr>
<td>N</td>
<td>421</td>
</tr>
</tbody>
</table>

* Standard error in parentheses
* Indicates 10% significance level for a two-tailed test.
** Indicates 5% significance level for a two-tailed test.
*** Indicates 1% significance level for a two-tailed test.

---

185. *See generally* Maher & Skidmore, *supra* note 147; Data files from Wisconsin Department of Public Instruction to the authors, *supra* note 182; Wis. Department of Public Instruction, *supra* note 182.
### TABLE 7 (CONTINUED)

**WISCONSIN SCHOOL SPENDING REGRESSION ESTIMATES: 1995 AND 2002**

<table>
<thead>
<tr>
<th></th>
<th>OLS Regressions*</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dep. Var.: Change in District Mill Rate</td>
<td>Full Sample</td>
<td>Low Tax Rate Districts</td>
<td>High Tax Rate Districts</td>
</tr>
<tr>
<td><strong>Constant</strong></td>
<td>0.953 ***</td>
<td>1.135 ***</td>
<td>0.408</td>
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</tr>
<tr>
<td><strong>Change in Tax Rate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in State Aid</td>
<td>-0.00029 ***</td>
<td>-0.00034 ***</td>
<td>-0.000078</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.000049)</td>
<td>(.000053)</td>
<td>(0.0001)</td>
<td></td>
</tr>
<tr>
<td>Change in Pct. Children in Poverty</td>
<td>4.426 **</td>
<td>0.342</td>
<td>9.116 ***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.873)</td>
<td>(2.366)</td>
<td>(2.949)</td>
<td></td>
</tr>
<tr>
<td>Change in per Pupil Property Valuation</td>
<td>-0.0098 ***</td>
<td>-0.010 ***</td>
<td>-0.0079 ***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0011)</td>
<td>(0.0014)</td>
<td>(0.0019)</td>
<td></td>
</tr>
<tr>
<td>Change in School-Aged Population</td>
<td>-0.457</td>
<td>0.3454</td>
<td>-3.134</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.314)</td>
<td>(1.573)</td>
<td>(2.196)</td>
<td></td>
</tr>
<tr>
<td>Change in Percent Rural</td>
<td>-0.0054</td>
<td>0.0095</td>
<td>-0.232</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0371)</td>
<td>(0.0351)</td>
<td>(0.293)</td>
<td></td>
</tr>
<tr>
<td>Change in Inverted Tax Price</td>
<td>-0.299 **</td>
<td>-0.194</td>
<td>-0.687 ***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.120)</td>
<td>(0.1344)</td>
<td>(0.231)</td>
<td></td>
</tr>
<tr>
<td>Bonding Referenda per Pupil</td>
<td>.000041 ***</td>
<td>.000037 ***</td>
<td>.0000415 ***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.0000045)</td>
<td>(.0000006)</td>
<td>(.0000065)</td>
<td></td>
</tr>
<tr>
<td>Exceed Revenue Cap Referenda per Pupil</td>
<td>0.00016 ***</td>
<td>0.00022 ***</td>
<td>0.00013 *</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.0000555)</td>
<td>(.0000797)</td>
<td>(.000076)</td>
<td></td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.313</td>
<td>0.351</td>
<td>0.285</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>421</td>
<td>209</td>
<td>212</td>
<td></td>
</tr>
</tbody>
</table>

* Standard error in parentheses
* Indicates 10% significance level for a two-tailed test.
** Indicates 5% significance level for a two-tailed test.
*** Indicates 1% significance level for a two-tailed test.
Calculation of Tax Prices

Below we describe in detail how we calculate the tax prices for each school district in Wisconsin in the pre-reform and the post-reform periods. A school district's tax price is defined as the amount of revenue a district has to raise in order to spend an extra dollar. To generate the tax price for each school district in pre- and post-reform, consider the following definitions:

- \( \text{EQV} = \) per pupil equalized value of property in the school district
- \( r = \) property tax rate for the school district
- \( G = \) per pupil general state aid to a school district
- \( \text{SC} = \) shared cost, or per pupil spending from school district own sources \((r \cdot \text{EQV})\)
- \( A = \) state equalization aid per pupil to the school district
- \( S = \) total spending per pupil for the school district
- \( \text{Tax Price} = \frac{\text{EQV}}{\partial S/\partial r} \)

Pre-1996 Formula

Prior to the 1996–1997 change in education finance, state equalization aid depended on a two-tier formula. To illustrate, in 1994–1995 if shared costs were less than or equal to $5617, the district received primary aid according to the following formula:

\[
A = [1 - (\text{EQV}/357,837)] \cdot \text{SC}
\]

However, if districts spent more than $5617, they received both primary and secondary aid:

\[
\text{primary} = [1 - (\text{EQV}/357,837)] \cdot 5617
\]

\[
\text{secondary} = [1 - (\text{EQV}/216,457)] \cdot [\text{SC} - 5617]
\]

Because \( \text{SC} = r \cdot \text{EQV} \), we replace \( \text{SC} \) with \( r \cdot \text{EQV} \) in the equations:

---

186. The tax price calculations are taken from Maher & Skidmore, supra note 147.
secondary = \[1 - \frac{\text{EQV}}{216,457}\] \times [r \times \text{EQV} - 5617]

We now write the total school district per pupil budget constraint as:

\[S = r \times \text{EQV} + G + A\]

For school districts spending less than $5617:

(a) \[S = r \times \text{EQV} + G + [1 - \frac{\text{EQV}}{357,837}] \times r \times \text{EQV}\]

For school districts spending more than $5617:

(b) \[S = r \times \text{EQV} + G + \frac{1}{216,457} \times [\text{EQV} - 5617] + \frac{1}{216,457} \times [r \times \text{EQV} - 5617]\]

To generate the tax price under the old school finance formula, we must take the partial derivative of \(S\) with respect to \(r\). For scenario (a) the partial derivative is:

\[
\frac{\partial S}{\partial r} = \text{EQV} + [\text{EQV} - \frac{(\text{EQV}^2/357,837)}{2}] = 2\times \text{EQV} - \frac{(\text{EQV}^2/357,837)}{2}
\]

The tax price is therefore: \(\text{EQV}/(\partial S/\partial r)\) or \(\text{EQV}/[2\times \text{EQV} - (\text{EQV}^2/357,837)]\).

Under scenario (b), the partial derivative of \(S\) with respect to \(r\) is:

\[
\frac{\partial S}{\partial r} = \text{EQV} + [\text{EQV} - \frac{(\text{EQV}^2/216,457)}{2}] = 2\times \text{EQV} - \frac{(\text{EQV}^2/216,457)}{2}
\]

Here, the tax price is \(\text{EQV}/[2\times \text{EQV} - (\text{EQV}^2/216,457)]\)

The value of the tax price depends on per-pupil equalized valuation (EQV). Roughly, for the lower half of the school districts in terms of per-pupil wealth, the tax price <1 but for the upper half of the districts the tax price >1. It is important to note that for districts that have an EQV that leads to zero state equalization aid (the wealthier districts), an additional dollar of property tax revenue will generate an additional dollar of spending, so that tax price = 1. Under this old regime, except for the lowest wealth districts and the very wealthiest districts that
receive no equalization aid, the state equalization aid formula discourages spending.

Post-1996 Formula

Following reform, Wisconsin’s school finance formula changed substantially. There are now four categories of school districts based on EQV and SC.\textsuperscript{187} To illustrate, in 2001–2002 these categories were defined as:

1. EQV ≥ $903,569
2. $325,154 < EQV < $903,569 and per pupil spending > $6848
3. EQV < $325,154 and per pupil spending > $6848
4. Per-pupil spending ≤ $6848

However, state equalization aid (A) depends on which of the above categories the school districts falls:

(a) For (1), A = $1000 − 0.5 mills*EQV, if EQV < $2 million, and A = 0 if EQV ≥ $2 million
(b) For (2) and (3), A = ($6848 - 9.972mills*EQV) + [(1 - (EQV/$325,154)*SC - $6848)]
(c) For (4), A = ($1000 - 0.5mills*EQV) + [(1 - (EQV/$903,569))]*(SC - $1000)]

Because SC = r*EQV + G, we replace SC with r*EQV + G in equations (2) and (3):

(a) A = $1000 − 0.5 mills*EQV, if EQV < $2 million, and A = 0 if EQV ≥ $2 million
(b) A = ($6848 - 9.972mills*EQV) + [(1 - (EQV/$325,154))*(r*EQV + G - $6848)]
(c) A = ($1000 - 0.5mills*EQV) + [(1 - (EQV/$903,569))*(r*EQV + G - $1000)]

The tax price equations can now be derived from the per pupil budget constraint. First, if A is determined by equation (1), tax price = EQV/(∂S/∂r) = 1. That is, every dollar of additional spending requires

\textsuperscript{187} RESCHOVSKY, supra note 10, at 10.
a dollar of own source property tax revenues.

If \( A \) is determined by equations (2) and (3):

\[
\frac{\partial S}{\partial r} = EQV + [1 - (EQV/\$325,154)]*EQV \\
= 2*EQV - (EQV^2/\$325,154)
\]

The tax price equation is then \( EQV/[2*EQV - (EQV^2/\$325,154)] \)

As long as \( EQV < \$325,154 \) (category (3) school districts), the tax price is <1. For these districts, an additional dollar of spending requires less than a dollar of own-source property tax revenues because of the inflow of additional state equalization aid. However, if \( EQV > \$325,154 \) (category (2) school districts), the tax price >1. For these districts, an additional dollar of spending requires more than a dollar of own-source property tax revenues because state aid is reduced as own spending increases.

If \( A \) is determined by equation (4):

\[
\frac{\partial S}{\partial r} = EQV + [1 - (EQV/\$903,569)]*EQV \\
= 2*EQV - (EQV^2/\$903,569)
\]

Here the tax price is \( EQV/[2*EQV - (EQV^2/\$903,569)] \)

For school districts falling into this category (which is only a few), the tax price can be quite low. An additional dollar of spending requires much less than a dollar of own-source property tax revenue.

**Comparison of Pre- and Post-reform Incentives**

From the formulae, it is difficult to identify the pattern of changes in tax price across school districts from pre- to post-reform. A particular school district's tax price depends on per pupil spending from own sources and tax base. An evaluation of the data shows that nearly all school districts experienced changes in tax price, but increases (decreases) do not appear to depend systematically on per pupil equalized value.

Following Hoxby and others, in the empirical analysis we use the
inverted tax price so that we expect a positive coefficient. That is, a higher inverted tax price (or lower tax price) as it is for the poorer districts, the greater is the probability of higher proportional spending growth/lower tax rate growth. Conversely, the lower the inverted tax price (or higher tax price) as it is for wealthy districts, the lower is the probability of higher proportional spending growth/lower tax rate growth.

188. See Hoxby, supra note 5, at 1205.