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Local Property Tax-Based Funding of Public Schools

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Introduction

In 1993, the Supreme Court of New Hampshire ruled in the case of *Claremont School District et al. v. Stephen E. Merrill, Governor, et al.*¹ that the state has a duty to provide an adequate education to children in the public schools of New Hampshire through an adequate system of funding. The Supreme Court remanded the case to the lower court for a new trial, and I was asked by the office of the Attorney General to prepare an expert witness report.²

I have consistently found evidence that both students and taxpayers are better off under locally based systems of school funding and school control.

To my knowledge, New Hampshire is one of very few states to take seriously its responsibility to solicit the opinions of economists who are nationally recognized academics in school finance (a specific branch of public finance economics). Many states do not include such expert testimony in their examinations of school finance. As a result, school finance reforms often do not adequately and accurately reflect the states' goals.

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In my research regarding the performance of public schools in the United States, I have consistently found evidence that both students and taxpayers are better off under locally based systems of school funding and school control.

Local school funding is not separable from well-functioning local control, either in theory or in practice. Local school funding makes competition among school districts meaningful, and I and others have found that competition among school districts benefits both students and taxpayers.

A system of public schools in which schools are organized into school districts and local education agencies and derive funding from local property tax revenue, is one of the best and most stable methods of financing public schools.

The existing New Hampshire system of public schools, in which schools are organized into school districts and local education agencies and derive funding from local property tax revenue, is not merely adequate but is an effective and efficient means of providing education. This system, which includes management and supervision by the State Board of Education and New Hampshire

Department of Education, is one of the best and most stable methods of financing public schools.

Organization of the Report

Part 1 explains why local school funding and local control of schooling make for more efficient and more effective education than can be achieved by centralized funding and control. Briefly, three reasons are discussed:

- X A system of school funding based on local property taxes gives incentives to both residents and school staff to maintain effective and efficient schools.
- X The local property tax system encourages people who place a high value on education to support public schooling. By contrast, statewide tax systems implicitly tax such people at a higher marginal tax rate, discouraging spending on public schools and encouraging private schooling.
- X The local property tax system provides a means by which the tax burden associated with schools can be distributed more fairly than under a statewide tax.

In Part 2, empirical evidence is offered in support of these statements. Data are drawn from comprehensive, nationally representative, publicly available, and objectively collected sources. Four tables are presented that summarize the evidence. Specifically:

X The State of New Hampshire, which increased its state share of school funding relatively little between 1980 and 1990, is found to have schools that are more efficient and more effective than schools in the six states that increased the state's share of public school revenue most over that period.

X In the nation as a whole, states that moved toward state-level funding for schools generally saw less improvement in school performance and more erosion of support for public schooling than did other states.

Schools are more efficient and there is greater support for public schooling in metropolitan areas where local control of education is stronger.

X The State of New Hampshire, whose education system is funded through a "foundation aid" system, is found to have schools that are more efficient and more effective than schools in states with education finance systems that negatively affect families who place a high value on education.

X In the nation as a whole, schools are more efficient and there is greater support for public schooling in metropolitan areas where local control of education is stronger and there is more competition among school districts.

Part 3 presents a summary and concluding remarks.

Analysis

Impact on Incentives

1. A system of school funding based on local property taxes gives incentives to residents to maintain effective and efficient schools.

Local property tax funding of schools gives residents good incentives because it provides a mechanism whereby their house prices reflect the value-added of their local public schools. The mechanism works as follows.

Local property tax funding of schools provides a mechanism whereby house prices reflect the value-added of local public schools.

Suppose the local public school district hires a new administrator who reorganizes the district so that it offers better education for the same budget. The value-added associated with the school district rises. Living in the school district becomes more desirable, because parents with school-aged

children are attracted. The prices of houses in the district rise, because there is increased demand for them. Residents of the school district benefit from this increase in their house prices, whether or not they actually have children in the schools.

Conversely, suppose the local public school district spends money on unsuccessful programs, so that education deteriorates for a given budget. The value-added associated with the school district falls. Residents of the school district lose, because their house prices fall to reflect the decreased demand for houses in the district.

This mechanism is known as “capitalization” and has been studied by scores of researchers. This research is summarized by Wallace Oates and Daniel Rubinfeld.³ The mechanism has desirable qualities that are worthy of note.

First, it gives *all* residents, not merely parents of school-aged children, an incentive to monitor the local public schools and see that they provide a good education. This quality is extremely important, because public schools would be inadequately funded if the parents of school-aged children were the only political support for appropriate levels of per-pupil spending at any given time.⁴

Second, the capitalization mechanism provides good incentives *automatically*. Residents of successful school districts are rewarded and thus have an incentive to allow their schools to continue the successful programs. Residents of unsuccessful school districts are penalized

and thus have an incentive to help their schools trade unsuccessful programs or administrators for successful ones. No statewide committee has to meet and assign rewards and penalties to school districts. The school district does not have to organize residents. Each resident has an individual incentive to either support the status quo or change.

Third, the capitalization mechanism provides good incentives through a *decentralized* process of determining the value of schools. With this mechanism, it is not necessary for all residents of a state to agree on what makes a school desirable. As long as a sufficient number of families find the school district's program desirable, house prices will be maintained. There is no need for a single, unanimous curriculum standard or a single, unanimous set of extracurricular activities. Thus, the capitalization mechanism gives good incentives to residents even when there are a variety of opinions about what makes a school desirable.

The capitalization mechanism provides good incentives through a *decentralized* process; it is not necessary for all residents of a state to agree on what makes a school desirable.

2. A system of school funding based on local property taxes gives incentives to school staff to maintain effective and efficient schools.

Funding for schools based on local property taxes not only provides good incentives for residents, but also provides good incentives for school administrators. The mechanism works as follows.

Schools are allocated a budget out of local property tax revenue. School administrators must present a case for the school's needs to the local school board and local residents each year. If the administrators are introducing successful programs, property values in the district rise by means of capitalization. This means that property tax revenue will be higher than in the previous year if the tax rate is kept the same. In this case, it will be relatively easy for administrators to maintain the school district's budget and continue the successful programs.

Conversely, suppose the administrators are allowing the district's programs to deteriorate. Then, property values in the district will fall by means of capitalization. This means that property tax revenue will be lower than in the previous year if the tax rate is kept the same. In this case, administrators will face an uphill battle if they want to maintain the school district's budget without making significant changes to the school's programs. Maintaining the school district's budget is likely to require an increase in the property tax rate. The administrators will have a strong incentive at this point to listen to the school board and local residents and agree about how to improve the schools. Administrators who do not wish to face an annual battle to maintain the budget will have an incentive to incorporate residents' needs and preferences when they are designing the school's programs.

This mechanism is known as "optimal regulation." Its operation in the public schools has

been described more extensively in work I have published previously.⁵ Optimal regulation has been studied by many researchers who examine other publicly regulated providers of public services, such as publicly owned utility companies.⁶ Through optimal regulation, increased competition among school districts translates into better student performance and more efficient provision of education. When school districts have to compete more strongly with one another to attract residents (and thus to raise property values and tax revenues), they offer programs that are more successful.

A system of school funding that largely relies on local property taxes gives the people most concerned with a school—the residents and school personnel—incentives to ensure that the school improves.

The optimal regulation mechanism provided by local property tax finance has the same desirable qualities for school personnel as the capitalization mechanism has for residents. First, the incentives are general, because every school staff member is eventually affected by the size of the budget. This is essential because all personnel, not merely administrators, must

participate in changing schools. Second, the mechanism provides good incentives *automatically*. The local property tax system and the annual budget allocation provide an automatic occasion for school administrators to either validate or adjust their programs.

Third, the mechanism is decentralized. Residents need not agree on a single, unanimous standard for what the schools should do, and they need not send a committee to supervise implementation for each classroom. Instead, so long as administrators create programs that are desirable to the relevant residents, no direct intervention is necessary. When the school board and residents do intervene during the budgetary process, they will focus on programs that appear to be unsuccessful. They are unlikely to set standards and intervene where the schools appear to be working.

In summary, a system of school funding that largely relies on local property taxes gives the people most concerned with a school—the residents and school personnel—incentives to ensure that the school improves. In practice, we observe that such people devote considerable time to understanding school programs and budgeting for them. They bring a wealth of local information to this process that would be difficult for a single statewide body to learn from the outside.

The good incentives of local property tax finance generate beneficial competition among schools: Schools must strive to provide successful programs. These good incentives would be difficult, if not impossible, for a statewide system of school funding to duplicate. This is true for the same reasons that every decentralized system of incentives (such as a market economy) is difficult to replicate with a centralized system of incentives (such as a centrally planned economy).

Finally, it is important to note that the good incentives for local control depend fundamentally on locally based funding. *It is not possible to maintain the good qualities of this local control without local funding to provide the incentives.*

Support for Public Education

The local property tax system encourages people who place a high value on education to support public schooling. By contrast, statewide tax systems implicitly tax such people at a higher marginal tax rate, discouraging spending on public schools and encouraging private schooling.

Consider a family that wishes to invest a high share of its income in educating its children. We might think of parents who are willing to sacrifice purchasing consumer goods in order to buy a house in a school district whose programs are perceived to be better. That is, this family would be willing

to pay more for a physically identical house in a more highly perceived school district, and that “excess payment” is exactly the extra amount that the family wants to spend on education. In a system of local property tax finance, such families are accommodated. The family pays more for its physically identical house, but the family also gets to send its children to a school that better reflects the family’s education preferences.

It is not possible to maintain the good qualities of local control without local funding to provide the incentives.

The division between the value of the physical property and the “excess payment” is notional. In practice, it is impossible to decompose the property value into its notional parts because the property value reflects so many intangible aspects of the location, including differences in preferences for education. It is better to recognize that property values simply cannot be treated as stable assets for the purpose of taxation, since changes in taxes are exactly the means by which property values become destabilized.

To understand how a statewide tax imposes a greater burden on people who value education highly, consider changing the source of funds from local property taxes to a statewide property tax. Families that wish to invest a high share of their income in education are now taxed at the statewide rate on (1) the value of their physical house or property and (2) the “excess payment” they made on the house. By contrast, families that wished to spend only an average amount on education are taxed at the statewide rate on just the value of the physical property.

If we wanted a measure of the *true* property tax burden on a family, we would need to divide a family’s tax payment by the value of just its physical property. This is not possible in practice for the reasons just mentioned. However, we do know that families who wish to invest a high share of income in education have a higher true tax burden under a “uniform” statewide rate than families who wish to invest less in education. The excessiveness of the true tax burden on families who value education highly is proportional to the “excess payment” made on their house or, equivalently, to the extra share of their income they wish to invest in education.

It is not necessary that the statewide tax be a property tax to produce heavier true tax burdens on families who value education highly. Consider a statewide sales or income tax, the proceeds of which are distributed to local school districts via a “percentage equalization” or “guaranteed tax base/tax yield” formula. Any formula of this kind gives less state revenue to districts whose property values contain more “excess payment.” This is because the formulas use measures of property tax base per weighted pupil.⁷ Therefore, if two school districts contain physically identical property, but the first district works harder to attract people who wish to make a high investment in schooling, then property in the first district will be worth more per pupil, and the first district will get less state revenue (generated by a sales or income tax). The first district will have a greater true tax burden.

Putting a greater true tax burden on families that wish to spend high shares of their incomes on education tends to undermine public schools.

The potential unfairness of a statewide tax to fund schooling is addressed in the following section. Here, I note that putting a greater true tax burden on families that wish to spend high shares of their incomes on education tends to undermine public schools. As in any situation where people who want a high quality service are charged

a greater unit price, high investment in public education will be discouraged by the greater true tax burden.

Families that place a high value on education will react in one of two ways. They may reduce their investment in education and spend the income on consumer goods instead. For example, they may choose to live in a school district with only average public schools, and then compensate by purchasing computers for their school-aged children. This will lower the average per-pupil spending in the state.

Even worse for the public school system, these families may switch from public schools to private schools. In this case, their desired spending on the public schools not only drops to the average level, but actually drops below the average level. The family may choose to save money by living in a school district with relatively poor public schools, and then spend the saved income on private education.

Both of these reactions have occurred in California, where statewide funding of schools puts a greater true tax burden on families that place a high value on education.⁸ Both of these reactions ultimately undermine the public school system, because they alienate exactly those people who care most about education. Also, the school districts that decrease their spending are precisely those whose higher spending was most likely to be productive and

least likely to be wasteful or inefficient. This is because the higher spending was based on the districts' *ability to attract* families that wish to make a high investment in education.

The tax problem just described is a problem of *marginal* tax rates. That is, the true tax rate on the marginal dollar of spending is higher for a family that wishes to make a high investment in education. Economists typically differentiate between marginal tax rates, which tend to distort behavior (as above), and infra-marginal taxes, which can often achieve redistributive goals without distorting behavior.

Unlike statewide taxes, "flat grant" and "foundation aid" systems are more like infra-marginal taxes that redistribute revenue among school districts without placing higher true marginal tax rates on districts whose families tend to value education highly. For example, New Hampshire's foundation aid system, which compares a district's funding capacity (measured by the harmonic average of tax capacity and income capacity) to a \$4,000 per weighted pupil foundation level, is unlikely to penalize districts whose families tend to value education highly. This is true for two reasons: (1) the tax rate actually set in these districts has a negligible effect on the formula, and (2) the additional property tax base generated in these districts by excess payments for houses is unlikely to move many districts from a situation of eligibility for foundation aid to a situation of ineligibility.

In summary, local property tax funding of public schools accommodates people who wish to invest a high share of their incomes in education and keeps their support for public schools. This typically results in higher average per-pupil spending and lower private school attendance rates than would be generated by a statewide tax. The higher average per-pupil spending that is associated with local property tax funding is likely to be productive spending, since *its existence depends on districts competing to attract families*.⁹ Finally, local property taxes are a method of funding public schools that causes relatively few distortions and can serve a state's redistributive goals when combined with a flat grant or foundation aid system that largely acts as an infra-marginal tax.

The higher average per-pupil spending that is associated with local property tax funding is likely to be productive spending, since its existence depends on districts competing to attract families.

The Fairness of Local Property Tax Funding of Schools

Contrary to popular belief, variation in local property tax rates is not a valid indicator of unequal tax burdens. Moreover, the local property tax system allows the tax burden associated with schools to be distributed more fairly than under a statewide tax.

It is a general principle of taxation that the true burden of a tax cannot simply be measured by the statutory tax rate. Earlier, for example, I demonstrated that a statewide tax rate that is statutorily uniform results in a true tax burden that is greater for families who wish to spend a high share of income on education. This point is well known to economists, as shown by Daniel Rubinfeld in his survey of the literature.¹⁰

No statewide, uniform property tax rate could be as fair as a local property tax. Nor could any statewide income- or sales-based tax whose revenues were distributed on the basis of property tax base per weighted pupil be as fair.

Moreover, local property tax rates generally provide a means by which greater, not lesser, fairness in the distribution of tax burdens can be achieved. No tax system is entirely fair, but property tax rates that are set locally can take into account the degree to which local property values actually represent a physical resource that can be tapped to fund schools. Precisely because property values

are not simply the value of physical property, a uniform, statewide tax rate is generally less fair than local property tax rates. This is true if the statewide tax is based on property or if the statewide tax is based on income or sales but distributed to local school districts based on property tax base per weighted pupil.

When the residents of a school district set a property tax rate, they take account of their own ability to pay, and thereby implicitly take account of the notional division of local house prices into “excess payment” and physical property. No statewide, uniform property tax rate could be as fair. Nor could any statewide income- or sales-based tax whose revenues were distributed on the basis of property tax base per weighted pupil be as fair.

In summary, variant property tax rates are not a valid indicator of unequal tax burdens. Property values are not a stable asset that can be tapped for taxes and remain unchanged. *These points are well understood by reputable economists.* Local property taxes are capable of taking local ability to pay into account and can achieve greater fairness than a statewide tax.

Supporting Empirical Evidence

Effect of Increasing the State's Share of School Revenue: New Hampshire versus Specific States

Table 1 on the following page examines whether U.S. states that increased the state's share of public school revenue the most between 1980 and 1990 became more efficient providers of education relative to New Hampshire. Detailed information on definitions and data sources is presented in note 11.¹¹

I compare New Hampshire to the six U.S. states that increased their state share of school funding the most between 1980 and 1990. California increased its state share of public school revenue by 21.4 percentage points; Indiana, 19.1 percentage points; Washington, 14.9 percentage points; Massachusetts, 14.8 percentage points; and Connecticut, 14.0 percentage points. Hawaii is the only state in the U.S. that collects and distributes all school revenue at the state level.

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Massachusetts is a particularly useful comparison for two reasons. First, Massachusetts shares a border with New Hampshire and experiences similar regional trends. Second, Massachusetts, along with New Hampshire, had one of the lowest state shares of school revenue at the beginning of the 1980-1990 period.¹² However, while New Hampshire maintained its low state share, Massachusetts' state share grew by nearly 15 percentage points between 1980 and 1990.

Table 1 uses three measures of education outcomes, all of which are directly relevant to success in life: the share of a state's students who earn a bachelors degree by age 23; the earnings of a state's male students between ages 26 and 30; and the share of a state's male students between 26 and 30 who were unemployed. I also examine the state's per-pupil improvement in education outcomes for a given increase in per-pupil spending. Finally, I use the state's share of enrollment in private schools as a measure of support for the public schools.

Table 1 shows that, by all measures of education outcomes, New Hampshire improved significantly relative to the states that most increased the state's share of school revenue. New Hampshire improved the college graduation rate of its students the most. New Hampshire students achieved top earnings growth and were among the least likely to become unemployed. Table 1 also demonstrates that New Hampshire achieved this relative improvement with moderate percentage growth in per-pupil spending. This fact indicates

that New Hampshire succeeded in maintaining both effective and efficient schools during the 1980-1990 period. Finally, New Hampshire's percentage growth in the private schools' share of enrollment during the 1980-1990 period was negative, while the other states' percentage growths were mainly positive and large. This implies that support for public education remained strong in New Hampshire over the period, while it eroded elsewhere.

Table 1
Efficiency of Public Schools and Support for Public Schools
New Hampshire vs. Six Comparison States

	College Graduation	Earnings	Unemployment	Per-Pupil Spending	Private Schooling
	Percent of State's Students Who Get B.A. Degrees	Earnings of State's Average Student	Percent of State's Students Who Are Unemployed	School Expenditure per Pupil ¹³	Share of State's Students Who Attend Private Schools
	1980-90 Change (in percent)	1980-90 Percentage Change	1980-90 Change (in percent)	1980-90 Percentage Change	1980-90 Percentage Change
New Hampshire	7.0	81	-1.9	25	-11
Massachusetts	4.3	81	1.6	23	-2
California	5.6	62	0.1	6	56
Hawaii	-2.4	60	0.5	50	72
Indiana	1.1	44	-1.5	7	23
Washington	-0.1	44	-2.0	-3	80
Connecticut	2.6	76	0.4	55	12

Overall, Table 1 demonstrates that states that increased the state's share of school revenue the most achieved relatively poor improvement in education outcomes per dollar spent compared to New Hampshire. These six states also experienced greater growth in private school attendance. The evidence supports the point that state funding for schools worsens rather than improves the public schools.

Effect of Increasing the State's Share of School Revenue: New Hampshire versus All States

The results reported above for Table 1 suggest a general tendency towards lower school efficiency and less support for public schools in states that increased the state's share of revenue. Table 2 below goes beyond the state-to-state comparisons of Table 1 and examines the general tendency. Each state is classified either as a state that did not increase its state share over the 1980-1990 period or as a state that did increase its state share. New Hampshire is compared to these two classes of states. The same variables are examined as in Table 1.

Table 2
Efficiency of Public Schools and Support for Public Schools
New Hampshire vs. All States

	College Graduation	Earnings	Unemployment	Per-Pupil Spending	Private Schooling
	Percent of State's Students Who Get B.A. Degrees	Earnings of State's Average Student	Percent of State's Students Who Are Unemployed	School Expenditure per Pupil	Share of State's Students Who Attend Private Schools
	1980-90 Change (in percent)	1980-90 Percentage Change	1980-90 Change (in percent)	1980-90 Percentage Change	1980-90 Percentage Change
New Hampshire	7.0	81	-1.9	25	-11
States that Did Not Increase the State's Share of School Revenue 1980-1990	0.7	52	0.2	8	13
States that Increased the State's Share of School Revenue 1980-1990	0.4	46	0.4	1	33

Table 2 strongly confirms the results of Table 1: States that moved toward state-level funding for schools generally saw less improvement in school performance and more erosion of support for public schooling. One of the most striking things about Table 2, however, is that New Hampshire is clearly a good outlier. New Hampshire's improvement in educational outcomes between 1980 and 1990 was far above the average for either class of states. This implies that other states may have more to learn from New Hampshire's system of education finance than New Hampshire has to learn from them.

Effect of Alternative Funding Mechanisms: New Hampshire versus All States

In Table 3, my goal is to determine whether systems of state finance that increase true marginal tax rates on families who place a high value on education particularly undermine the public schools. Table 3 classifies U.S. states by their major state aid program and compares each class to New Hampshire. The same variables are examined as in Tables 1 and 2: college graduation, earnings, unemployment, per-pupil spending, and private schools' share of enrollment.

The funding classifications are, in order of ascending marginal tax rates: flat grant, foundation aid, guaranteed tax base/tax yield, percentage equalization, and full state funding. (The ranking of "guaranteed tax base/tax yield" and "percentage equalization" relative to one another is arbitrary.) These classifications were first employed by Richard G. Salmon et al. Brief descriptions are contained in note 14.¹⁴

The states with "full state funding" experienced rather dramatic percentage growth in private schools' share of enrollment.

Table 3 demonstrates that New Hampshire's educational outcomes per dollar spent have improved relative to states in the high marginal tax rate classifications of "guaranteed tax base/tax yield," "percentage equalization," and "full state funding."

New Hampshire students improved their college graduation rate more than students from states with high marginal tax rates, improved their earnings more, and experienced less unemployment. New Hampshire achieved this with moderate per-pupil spending growth. Finally, New Hampshire's private school enrollment share contrasts sharply with what appears to be deteriorating support for public schooling in the states with high marginal tax rates. The states with "full state funding" experienced rather dramatic percentage growth in private schools' share of enrollment. This evidence accords well with that of Thomas Downes, who finds significant growth in California's private schools enrollment after the move to full state funding.¹⁵

Table 3
Efficiency of Public Schools and Support for Public Schools
New Hampshire vs. States Classified by Major State Aid Programs

	College Graduation	Earnings	Unemployment	Per-Pupil Spending	Private Schooling
	Percent of State's Students Who Get B.A. Degrees	Earnings of State's Average Student	Percent of State's Students Who Are Unemployed	School Expenditure per Pupil	Share of State's Students Who Attend Private Schools
	1980-90 Change (in percent)	1980-90 Percentage Change	1980-90 Change (in percent)	1980-90 Percentage Change	1980-90 Percentage Change
New Hampshire	7.0	81	-1.9	25	-11
Flat Grants from State to School Districts	0.1	53	-0.1	12	45
"Foundation Aid" from State to School Districts	0.6	58	0.6	21	42
"Guaranteed Tax" Aid from State to School Districts	1.1	57	-0.9	17	10
"Percentage Equalization" Aid from State to School Districts	1.5	54	1.4	25	12
Approximately Full State Funding	-0.5	49	1.0	5	59

Effect of Local Control

In Table 4, I use a quite different measure of local control of public schools. The goal is to understand whether a greater degree of local control enhances the education outcomes of public school students and support for public schools. In order to measure the degree of local control, I use a measure of enrollment concentration that I and others have successfully used in other research.¹⁶ Detailed information on definitions and data sources is presented in note 17.¹⁷

Local control is more effective in a metropolitan area where (1) the school districts are smaller relative to the size of the metropolitan area and (2) enrollment is spread more equally among school districts. That is, if households can choose residences among a larger and more comparable set of alternative school districts, family choices of school districts will be more meaningful: The capitalization and optimal regulation mechanisms will work more strongly. As a result, schools will compete more diligently to offer successful programs at fair prices, and student performance will tend to improve under this beneficial competition.

Where local control is stronger and there is more competition among schools, schools are more efficient and there is greater support for public as opposed to private schools.

A Herfindahl index of enrollment concentration is a good overall measure of local control. This index varies between 0 and 1 and moves towards 0 as (a) the school districts are smaller relative to the total enrollment in the metropolitan area and (b) enrollment is spread more equally among school districts. (Formally, the Herfindahl index is the sum of squared

enrollment shares in a metropolitan area. See note 17.) For example, a 0.10 value of the index is equivalent to 10 equal-sized school districts in a metropolitan area; a 0.20 value of the index is equivalent to 5 equal-sized school districts; a 0.50 value is equivalent to 2 equal-sized school districts; and a 1.00 value is equivalent to 1 school district.

Table 4 divides metropolitan areas of the U.S. into four categories: high degree of local control (index less than 0.10); medium-high degree of local control (index greater than 0.10 and less than 0.20); medium-low degree of local control (index greater than 0.20 and less than 0.50); and low degree of local control (index greater than 0.5). For comparability, all the results shown in Table 4 are for metropolitan areas of medium size (between the 25th and 75th percentile of metropolitan populations).

Table 4 shows that students who attend school in metropolitan areas with more local control are more likely to earn a bachelor's degree by age 24 and to earn higher wages between the ages of 26 and 30. In addition, these better results are achieved for lower expenditures per pupil in metropolitan areas with more local control. Finally, students who attend school in metropolitan areas with more local control are more likely to attend public schools as opposed to private schools.

Table 4
Efficiency of Public Schools and Support for Public Schools
by Degree of Local Control

	College Graduation	Hourly Wages	Per-Pupil Spending	Private Schooling
	Percent of State's Students Who Get B.A. Degrees	Hourly Wage of State's Average Student in 1990	School Expenditure per Pupil	Share of State's Students Who Attend Private Schools
	Aged 26-30 in 1990	Aged 26-30 in 1990	1990	1990
Metropolitan Areas with:				
High Degree of Local Control	18	\$10.68	\$5,377	14
Medium-High Degree of Local Control	16	\$9.72	\$4,566	14
Medium-Low Degree of Local Control	13	\$8.80	\$4,386	17
Low Degree of Local Control	11	\$8.98	\$5,523	19

In summary, the evidence of Table 4 demonstrates that where local control is stronger and there is more competition among schools, schools are more efficient and there is greater support for public as opposed to private schools. Public school students are the ultimate beneficiaries.

Summary and Concluding Remarks

The existing New Hampshire system of public schools, in which schools are organized into school districts and local education agencies and derive funding from local property tax revenue, is not merely adequate but is an effective and efficient means of providing education. This system, which includes management and supervision by the State Board of Education and New Hampshire Department of Education, is one of the best and most stable methods of financing public schools for several reasons.

- X First, the local property tax system of finance provides correct incentives for both residents and school personnel. School funding based on a local property tax gives residents an incentive to desire good and efficient local schools. Local property tax

The local property tax system of finance encourages schools to compete to provide good education efficiently.

funding gives school personnel an incentive to *provide* good and efficient local schools. The result is that schools compete to provide good education efficiently. Student performance improves owing to this competition, and taxpayers pay less for the same quality of education.

- X Second, the local property tax system does not penalize people who wish to invest a high share of their incomes in education. By contrast, many statewide taxes for school funding implicitly tax such people at a higher rate. These statewide taxes not only include statewide property taxes, but also statewide sales or income taxes when the revenue generated is distributed to school districts based on a formula that takes the local property tax rate or property tax base into account. Thus, local property tax funding, rather than statewide tax funding, encourages people who value education to support *public* schooling. Their support of public schooling means that per-pupil spending in a state will be maintained, because it will partly reflect the high value they place on education.
- X Third, variant local property tax rates are not an indication of unequal burdens for public school funding. Tax burdens cannot be adequately measured by tax rates; this is a point that has long been understood by economists who analyze taxes. In the case of the local property tax, the property tax rate does not measure burden because the tax is not levied on the physical property, which is a stable asset or resource that would have some value regardless of the school district in which it is located. Instead, the property tax is allocated according to property *values*, and property values are not stable assets that are independent of school district location. When a district's property tax rate rises, property values fall to compensate. This means that property tax rates are not a valid measure of "fiscal burden." Moreover, because property tax rates that are set locally can take into account the local differences in ability to pay relative to property value, the local property

tax system provides means for greater fairness in the distribution of the tax burden than does a statewide tax.

A substantial body of empirical evidence supports these three points.

- X First, it has been documented that public schools have become less effective and efficient providers of education in states that have moved from local property tax funding towards statewide funding. Student performance has improved more, especially per dollar spent on schooling, in states that maintained local funding.
- X Second, students receive better education in areas with stronger local control. Where school districts compete more strongly with one another, student performance is better, especially per dollar spent on schooling.
- X Third, public support for public schools is stronger where school funding and control are local. A greater share of children attend public, as opposed to private, schools in states with more local funding and local control.

The evidence is clear and convincing: Students and taxpayers alike are better off under locally based systems of school funding and school control.

The public policy implications of the research described in this report are straightforward. A state's system of school finance can have a profound effect, for good or for ill, on the education of its school-aged children. The evidence is clear and convincing: Students and taxpayers alike are better off under locally based systems of school funding and school control.

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Endnotes

1. *Claremont v. Governor*, 138 N.H. 183 (1993).
2. The re-trial was heard in mid-1996, and in December 1996 the lower court upheld the constitutionality of the state's property-tax-based system for funding public schools. That decision is being appealed to the state's Supreme Court.
3. Wallace Oates, "Local Public Finance," chapter 9, and Daniel Rubinfeld, "The Economics of the Local Public Sector," chapter 11, in Alan Auerbach and Martin Feldstein, editors, *Handbook of Public Economics* (Amsterdam: North-Holland, 1987).
4. For evidence that per-pupil spending is low where elderly residents have little incentive to support the public schools, see James Porterba, "Demographic Structure and the Political Economy of Public Education," Massachusetts Institute of Technology, unpublished; and David Cutler, Douglas Elmendorf, and Richard Zeckhauser, "Demographic Characteristics and the Public Bundle," *Public Finance/Finances Publique* 48 (1993), pages 178-198.
5. Caroline M. Hoxby, "Is There An Equity-Efficiency Trade-Off in School Finance? Tiebout and A Theory of the Local Public Goods Producer," *NBER Working Paper* No. 5625, 1995.
6. See Jean-Jacque Laffont and Jean Tirole, *A Theory of Incentives in Procurement and Regulation* (Cambridge, MA: The MIT Press, 1993).
7. There are many formulas that states use to "adjust" for differences in property tax base. They are known by a variety of names, including percentage equalization, guaranteed tax base, and guaranteed tax yield. All of the formulas share the feature that more state revenue is given to districts with lower property tax base per weighted pupil. Any formula with this feature imposes a greater true tax burden on people who value education highly.
8. See William A. Fischel, "Did Serrano Cause Proposition 13?" *National Tax Journal* 42 (1989), pages 465-474; and Thomas Downes, "Evaluating the Impact of School Finance Reform on the Provision of Public Education: The California Case," *National Tax Journal* 45 (1992), pages 405-420.
9. This does not imply that all school spending is likely to be productive. One of the reasons that school spending is not generally found in empirical studies to be productive is that much school spending does not depend on a mechanism where schools compete to be efficient providers.
10. Daniel Rubinfeld, *supra* note 3.
11. Definitions:

College Graduation is the percentage of students who receive a bachelor's degree by age 23. The amounts shown in the table are the changes between 1980 and 1990 in the percentage of students who receive a bachelor's degree. The students from each state are people who were born and attended high school in that state. They need not still live in the state.

Earnings is the earned income of male students who are aged 26 to 30 in 1990. The amounts shown in the table are the percentage change between 1980 and 1990 in the

earnings of males currently aged 26 to 30 who were schooled in the relevant state. Males alone are used because their earnings are a more consistent indicator than those of females, for whom careful adjustment for child-rearing and household work is necessary. Earnings are measured in dollars of the day (nominal dollars).

Unemployment is the percentage of male students aged 26 to 30 in 1990 who are either unemployed or “out of the labor force.” The amounts shown in the table are the changes between 1980 and 1990 in the percentage of students who are unemployed or out of the labor force. Males alone are used because their unemployment and labor force status are a more consistent indicator than those of females, for whom careful adjustment for child-rearing and household work is necessary.

Per-Pupil Spending is total school expenditure divided by total school membership. Membership is defined according to the definition of the U.S. Department of Education’s Common Core of data. Expenditure is measured in dollars of the day (nominal dollars).

Private Schooling is the share of school enrollment accounted for by private schools. The *percentage change* in the share of enrollment accounted for by private schools is calculated as follows. Let S_{1980} = private schools’ share of state enrollment in 1980. For instance, a typical S_{1980} is 10 percent. Let S_{1990} = private schools’ share of state enrollment in 1990. Then, the percentage growth in the share of enrollment accounted for by private schools is $(S_{1990} - S_{1980})/S_{1980}$.

Sources:

- (1) Census of Population 1990, Public Use Microdata 5 Percent Sample. This is a 5 percent random sample of the actual responses of individuals to the 1990 Census. These are individual, not aggregate, data. They enable one to identify the state where each individual was born, grew up, and lived while in high school—regardless of the state in which the individual now lives. Thus, people who were New Hampshire students can be identified in every U.S. state. These data constitute the single largest and most representative survey of individual U.S. residents that is publicly available. The sample contains 13,173,305 people.
 - (2) Census of Population 1980, Public Use Microdata 5 Percent Sample. Same as above for 1980.
 - (3) Common Core of Data, U.S. Department of Education, 1990. These data cover every school district in the U.S. and use standardized definitions of expenditure, school membership, private school enrollment, sources of revenue, and other indicators. The data are thereby made as comparable as possible across U.S. school districts. These are individual school district data, not aggregate data. State-level averages are membership-weighted. For instance, per-pupil spending is the membership-weighted average of individual districts’ expenditure/membership.
 - (4) School District Summary File, 1980 Census of Population. These data contain the demographic variables for every U.S. school district—equivalent to the demographic information in the 1990 Common Core of Data.
 - (5) Census of Government 1992. These data cover the enrollment, expenditures, sources of revenue, and employees of every school district in the U.S. They use standardized definitions. These are individual school district data, not aggregate data. State-level averages are membership-weighted. The Census of Governments is taken every five years on years ending in “2” or “7.”
 - (6) Census of Governments, 1982. Same as above for 1982.
 - (7) Census of Governments, 1972. Same as above for 1972.
12. In 1990, New Hampshire’s state share of school funding was 7.7 percent. By comparison, Hawaii’s state share was 100.0 percent; Washington’s, 78.0 percent; California’s, 72.0

percent; Indiana's, 59.4 percent; Connecticut's, 43.3 percent; and Massachusetts', 38.9 percent.

13. The U.S. Department of Education refers to this measure as "Expenditure per Average Daily Membership." See note 11.
14. The implicit marginal tax rate on local revenue rises from "Flat Grant" to "Full State Funding." However, though "Guaranteed Tax" and "Percentage Equalization" programs unambiguously fall between "Foundation Aid" and "Full State Funding," the ranking of "Guaranteed Tax" and "Percentage Equalization" programs is arbitrary. Some "Guaranteed Tax" programs have higher marginal tax rates than some "Percentage Equalization" programs, and *vice versa*.
States are classified by their major state aid programs as of the mid-1980s, so that one would expect to see the effects of the programs in the students examined. This classification is found in Richard G. Salmon et al., *Public School Finance Programs of the United States and Canada*. The classifications are, briefly, as follows: Flat grant (5 states): a fixed amount of state revenue is allocated on a per-unit basis to all local school districts. Foundation Aid (22 states): state aid is based on the difference between the state's foundation program dollar value times weighted pupils minus the mandated "fiscal effort" times the "fiscal capacity" of each district. Guaranteed Tax Base/Tax Yield Programs (6 states): state aid is based on a guaranteed dollar amount per pupil for each mill levied. Percentage Equalization (5 states): state aid is based on the ratio of the "fiscal capacity" per pupil of the district to the "fiscal capacity" per pupil of the state. Full State Funding (4 states): state government provides at least two-thirds of total revenue plus equalization that deducts most local revenue from state allocations. The phrases "fiscal capacity" and "fiscal effort" are in quotation marks because they do not correspond to economic definitions of tax capacity or tax burdens.

Sources:

In addition to the sources identified for Table 1 above,

(8) Richard J. Salmon, Christina Dawson, Steven Lawton, and Thomas Johns, compilers and editors, *Public School Finance Programs of the United States and Canada*. 1986-87 edition. American Education Finance Association, 1988.

15. Thomas Downes, *supra* note 8.
16. See Caroline M. Hoxby, "Does Competition Among Public Schools Benefit Students and Taxpayers? Evidence from Natural Variation in School Districting," *NBER Working Paper* No. 4979, 1994 (forthcoming, *American Economic Review* 1998); and Melvin Borland and Roy Howsen, "Student Academic Achievement and the Degree of Market Concentration in Education," *Economics of Education Review* 38 (1992), pages 31-39.
17. The degree of local control in a metropolitan area is measured as follows. Every school district in the metropolitan area has a share of the metropolitan area's total pupil membership. These shares are squared and the squared shares are totaled for each metropolitan area. This calculation produces a Herfindahl Index of the concentration of local control. The Herfindahl Index ranges from 0 (many localized districts each have a small share of the metropolitan area's enrollment) to 1 (one school district controls all the metropolitan area's enrollment). The Herfindahl Index is a standard economic measure of concentration and is the one preferred by the U.S. Department of Justice to measure industry concentration for antitrust investigations.
Metropolitan areas only are used because it is difficult to consistently measure the

degree of local control in rural areas.

Definitions:

College Graduation is the percentage of students who receive a bachelor's degree by age 23. The amounts shown in the table are the changes between 1980 and 1990 in the percentage of students who receive a bachelor's degree. The students from each state are people who were born and attended high school in that state. They need not still live in the state.

Hourly Wages is the hourly wage of male students who are aged 26 to 30 in 1990. The amounts shown in the table are the hourly wages on the current job for males aged 26 to 30 in 1990 who were schooled in the relevant metropolitan area. Males alone are used because their hourly wages are a more consistent indicator than those of females, for whom careful adjustment for child-rearing and household work is necessary. Hourly wages are measured in dollars of the day (nominal dollars).

Per-Pupil Spending is total school expenditure divided by total school membership. Membership is defined according to the definition of the U.S. Department of Education's Common Core of data. Expenditure is measured in dollars of the day (nominal dollars).

Private Schooling is the share of school enrollment accounted for by private schools.

Sources:

- (1) National Longitudinal Survey of Youth. The Center for Human Resource Study, The Ohio State University for the U.S. Department of Education, National Center for Education Statistics. This is a national sample of students who are followed from their teenage years (ages 14-21 in 1979) through the present time (ages 30-37 in 1995). This is a source of very detailed information about a person's school and work history. These are individual, longitudinal data that allow one to track individuals as they are schooled in one metropolitan area, attend college elsewhere, and reside and work in a number of locations. The sample contains 12,686 people.
- (2) Census of Population 1990, Public Use Microdata 5 Percent Sample. This is a 5 percent random sample of the actual responses of individuals to the 1990 Census. These are individual, not aggregate, data. They enable one to identify the state where each individual was born, grew up, and lived while in high school—regardless of the state in which the individual now lives. Thus, people who were New Hampshire students can be identified in every U.S. state. These data constitute the single largest and most representative survey of individual U.S. residents that is publicly available. The sample contains 13,173,305 people.
- (3) Common Core of Data, U.S. Department of Education, 1990. These data cover every school district in the U.S. and use standardized definitions of expenditure, school membership, private school enrollment, sources of revenue, and other indicators. The data are thereby made as comparable as possible across U.S. school districts. These are individual school district data, not aggregate data. State-level averages are membership-weighted. For instance, per-pupil spending is the membership-weighted average of individual districts' expenditure/membership.
- (4) Census of Government 1992. These data cover the enrollment, expenditures, sources of revenue, and employees of every school district in the U.S. They use standardized definitions. These are individual school district data, not aggregate data. State-level averages are membership-weighted. The Census of Governments is taken every five years on years ending in "2" or "7."