SENATE EDUCATION
EXHIBIT NO. 4
DATE 3/15/13
BILL NO. SB 374

THE FISCAL EFFECTS

of School Choice Programs on Public School Districts

BENJAMIN **SCAFIDI**, Ph.D.

March 2012

THE FRIEDMAN FOUNDATION
FOR EDUCATIONAL CHOICE
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Executive Summary

The public education establishment routinely argues that school choice programs, where "the money follows the child," harm students who remain in public schools. They suggest that students who remain in public schools are worse off because there will be fewer resources available for their education once some children depart public school districts via school choice. That is, there will be fewer students and, consequently, fewer taxpayer dollars to cover the substantial fixed costs of running a school.

Instead, research shows that all forms of school choice tried in the United States have led to improvement in academic outcomes for students who remain in public schools or have led to no effect on academic outcomes for students who remain in public schools. Thus, the evidence on academic outcomes is one-sided. Greater school choice does not harm academic outcomes for students who remain in public schools.

But what about money? The evidence on the fiscal effect of school choice on public school districts is not readily available. Costrell (2008, 2010) shows that it is straightforward to design a school choice program that saves taxpayers money.[1] He also suggests that the fiscal effect of a given school choice program on local school district budgets is more complicated. Specifically, school choice programs that allow school districts to retain funding for any fixed costs would not harm the fiscal health of public schools or decrease resources available to students who remain in public schools.

In this report, I construct the first ever estimates for each state and the District of Columbia of the short-run fixed costs of educating children in public schools. I endeavor to make cautious overestimates of these short-run fixed costs.

The United States' average spending per student was $12,450 in 2008-09. I estimate that 36 percent of these costs can be considered fixed costs in the short-run. The remaining 64 percent, or $7,967 per student, are found to be variable costs, or costs that change with student enrollment. The implication of this finding is that a school choice program where less than $7,967 per student is redirected from a child's former public school to another school of his or her parents' choosing would actually improve the fiscal health of the average public school district. And, it would provide more resources for students who remain in public schools.

New York has the highest estimate of short-run variable costs per student at $13,741 per student. Utah has the lowest, at $5,192 per student. The estimates of variable costs per student vary widely among states for two reasons. First, some states devote more taxpayer funding to public education. Second, some states spend much higher proportions of their education dollars on instruction (a variable cost) relative to other states.

In the interest of creating an overestimate of fixed costs, this report treats the following as fixed costs in the short-run: expenditures on capital, interest, general administration, school administration, operations and maintenance, transportation, and "other" support services. Of course, if a significant number of students left a school district from one year to the next, some of these costs could be reduced immediately. For example, a school losing a large number of students could reduce the number of assistant principals from two to one; there could be fewer bus routes; two schools could be merged into one; etc. However, the goal of this report is to create an overestimate of fixed costs. A cautious overestimate allows us to be comfortable that school choice programs where "the money follows the child" can be designed in such a manner to improve the fiscal situation of public school districts.

While I treat expenditures on capital, interest, general administration, school administration, operations and maintenance, transportation, and "other" support services as fixed costs in the short-run for the present analysis, all of these costs are variable in the long-run. Public schools can make new strategic decisions in these areas in response to permanent changes in their student counts. Thus, after a few years of a new school choice program, when enrollment trends become apparent, all taxpayer funds devoted to K-12

education can "follow the child" to the schools their parents deem better.

The proper way to think about this issue is not whether public school districts have in the past reduced costs when students in large numbers left the district for any reason. The issue is whether they are able to do so. Evidence that school districts increased expenditures when the number of students they served significantly decreased does not necessarily mean that they cannot decrease expenditures when students leave. Perhaps they did not have to reduce expenditures when students left because one or more levels of government chose not to reduce taxpayer funding, so districts did not reduce expenditures.

The key question for this analysis is the following:

> If a significant number of students left a public school district for any reason from one year to the next, then is it feasible for the district to reduce some of its expenditures commensurate with the decrease in its student population?

The answer that comes from analyzing the finances of large and small school districts that lost students is "yes." Both the large school districts and the small ones were able to reduce the combination of instructional and support expenses at a higher rate than the losses in students. Thus, these costs were variable, even in the short-run.

The rationale as to why a loss of students and the funding associated with those students could increase the performance of traditional public schools is twofold. First, a large number of empirical studies have found very large differences in teaching effectiveness across public school teachers.[2] If public schools lose students and funding, they could choose to lay off the least effective teachers. The remaining students would be reassigned to more effective teachers, which would lead of a significant improvement in their academic achievement. Second, Chakrabarti (2007) has shown theoretically and empirically that when more money follows the child, the incentives are stronger for public school leaders to improve their schools. In Milwaukee, they did improve the public schools when there was an increase in the amount of money that followed voucher students to private schools.[3]

Introduction

Since the public education system was created—with taxpayer funded elementary and secondary schools managed and controlled by government entities—American families have always had some amount of school choice. Even in states with no vouchers, tax-credit scholarships, or charter schools, parents with means have had school choice. Parents who can afford to move to an area with better public schools have been legally able to do so in order to choose a public school they deem better for their children. Parents have also been able to choose to use some of their after-tax income to pay tuition at a private school.

With evidence that public high school graduation rates peaked 40 years ago and have since declined, that public school student performance on national exams has been roughly flat for 40 years, that American students achieve at lower levels than students in many other developed nations, that spending per student is high and has grown rapidly over time, and that many in the business community believe that public schools have not adapted in order to prepare students for the economy of the 21st century, education reformers in virtually every state advocate for some form of greater school choice in K-12 education.[4] Under these school choice proposals, parents would be able to send their child to a taxpayer-funded charter public school that is governed by parents and community leaders or to a private school with tuition payments being offset by a voucher or tax-credit scholarship. Essentially, what education reformers advocate is that taxpayer money "follows the child" to the school of his or her parents' choice. If the child attends a traditional public school under the governance of a public school board, taxpayer funds would follow to the school board. If, however, parents choose an alternative, then taxpayer funds would follow the child to the charter or private school that the parents have chosen.

The public education establishment routinely argues that school choice proposals that involve the money following the child harm students who remain in public schools. They suggest that when some children leave their public school districts via school choice that students who remain in public schools will be worse off because there will be fewer resources available for their education. That is, there will be fewer students and, consequently, less taxpayer funding to cover the substantial fixed costs of running a school.

Does School Choice Cause Fiscal Harm to Public School Districts?

Leaders of the public school system routinely suggest in legislative and public debates over school choice that when any student leaves a public school to attend a charter school, a virtual school, or a private school and taxpayer funds are redirected to the child's new school that the child's former public school is harmed financially. The claim is that when a child leaves via school choice that the public school retains significant fixed costs. A decrease in students means that there is less money to spend on these large fixed costs of operating a school. So, if students leave and these costs are truly fixed and must be paid in order for the school to operate, then the students who remain in public schools will have fewer resources devoted to their education.

If you follow the logic of these opponents of school choice, there is some dollar amount that could follow a child to a charter public school, a virtual school, or a private school that is equal to or less than the variable cost of that student. And the loss of that amount of funding would not have an adverse fiscal impact on the former public school or the students who remain there. I am not suggesting that public school leaders would support a school choice program where the amount of funding that follows a child is less than what they consider the variable cost of the students who left. What I endeavor to do in the pages that follow is to estimate what are the fixed and variable costs of educating a student in public schools. Further, I endeavor to be cautious in the interest of overestimating fixed costs and underestimating variable costs. Thus, in the pages and charts that follow, I make a case that I have obtained dollar amounts for each state in the United

$$\frac{\text{Public School Spending Per Student} - \text{Money that Follows the Child to a School of Choice}}{\text{Public School Spending Per Student}} > \text{Proportion of School Choice Recipients Who Would Not Have Been Enrolled in Public School}$$

States that could follow the child to a school his or her parents deem better without causing fiscal harm to public school districts.

Background Information

Before constructing cautious state-specific estimates of fixed and variable costs of educating students in public schools, some background information is necessary to put the analysis in context.

It is worth noting that I have never heard a public school leader or lobbyist suggest that we should not allow a child to leave one public school and transfer to another public school district because it would harm the budget of the initial public school. Public schools are typically funded with a mix of taxpayer funds that come from federal, state, and local governments. When a child moves from one public school to a public school in another district, the former public school loses—often not immediately—the federal and state funds associated with the child, but retains local funds. All of that said, even voucher and tax-credit scholarship programs, for example, that allow only funds generated by state taxpayers to follow a child to a private school are met with fierce resistance by public school leaders and their lobbyists on the grounds that there will be a negative fiscal impact on public schools. Of course, if a child leaves with only state taxpayer funds that follow to a private school, it would have the same fiscal effect on the former public school as if the child had left for another public school district. But only one of these scenarios leads to vocal and strong opposition.

Of course, public school managers have other objections to school choice. The present report is concerned only with the academic and fiscal effects of school choice on students who remain in traditional public schools.

Costrell (2008, 2010) has shown how school choice programs can save taxpayers money.[5]

As shown in the expression above, if the amount of money that follows the child to a school his or her parents deem better is less than what public schools spend per student, then a school choice program that only allows students who would have been in public school to participate would save taxpayers money (as the term on the far right of the expression would be zero). Consider a state that spends $10,000 per student in the public schools. A school choice program that offers $9,000 scholarships to public school students to attend the private or charter school of their choice would save taxpayers $1,000 per student.

For another scenario, let's assume that under a given school choice program 10 percent of the students who were allowed to exercise school choice would not have been enrolled in a public school even if the choice program did not exist. Under this example, the expression above shows that as long as the amount of taxpayer money that is redirected to the school of choice is less than 90 percent of the amount that would have funded the student in a public school, then the school choice program saves taxpayers money. Using the formula above and the example in the preceding paragraph, this school choice program would be a break-even proposition for taxpayers. Plugging spending and scholarship amounts into the formula above yields the following arithmetic:

$$(\$10{,}000 - \$9{,}000) / \$10{,}000 = .10$$
$$\$1{,}000 / \$10{,}000 = .10$$
$$.10 = .10$$

Thus, a state that spends $10,000 per student in its public schools, and offers $9,000 scholarships to students who attend an alternative to traditional public schools, saves money as long as 90 percent or more of the scholarship recipients would have been enrolled in a traditional public school in the absence of the school choice program.

Costrell (2010) finds that the Milwaukee Parental Choice Program has saved Wisconsin taxpayers over $30 million per year in recent years.[6] He found that the average scholarship amounts in Milwaukee are significantly lower than the spending per student in Milwaukee Public schools.

In states such as Tennessee, legislators who sponsor school choice legislation must obtain "fiscal notes" that specify the effect of proposed school choice programs on local public school district budgets. That is, the legislators must show that their school choice legislation has no negative fiscal impact on the local public schools. Although the section above showed that there seem to be no negative academic effects of school choice on students who remain in public schools, this more practical concern seems to be important in school choice debates in many states. One might think that the policy concern should be about academic outcomes that result from greater school choice. However, in these tight fiscal times, state legislators from both major political parties echo the concern from the public school establishment that school choice programs will "divert" money away from local public school districts and thereby harm the public school systems that currently serve a large majority of children.

Costrell (2010) shows that the interaction between specific mechanisms in school funding formulas and funding for school choice programs can leave either more or less resources available for public school districts to spend.[7] Costrell hints that fixed costs may be an issue for school districts in the initial years of a very small school choice program. In his 2008 report, he comments on the fiscal effect of the Milwaukee Parental Choice Program (MPCP) on the Milwaukee Public School (MPS) district:

> "It might be argued that at the outset of MPCP the number of voucher students was small enough that MPS fixed costs remained fixed, so per pupil costs rose. By FY99, however, the number of voucher students was 5,761, a number that would seem to be large enough that many fixed costs become variable. Certainly the school level fixed costs for MPS would not pertain since MPCP attained the size of a large district. Approximately 95 percent of all school districts in Wisconsin have fewer students than MPCP did in FY99; only five districts, including Milwaukee, have more students than MPCP has today."[8]

Gottlob (2011), in a report for the Friedman Foundation for Educational Choice, constructs econometric estimates of the variable costs of educating students in public schools in Oklahoma. Given data limitations, he is forced to treat "expenditures" as "costs." Gottlob writes:

> "Research on education finance generally uses expenditures or revenues as synonymous with 'costs' but these measures do not reflect costs in a traditional economic sense. However, our procedure for estimating variation in expenditures does provide more of an empirical basis for estimating the expenditure impact related to educating each student in the short run than is typically used in education funding research."[9]

He cites two other research reports that use similar approaches for estimating fixed and variables costs of educating students in public schools in Utah and South Carolina.

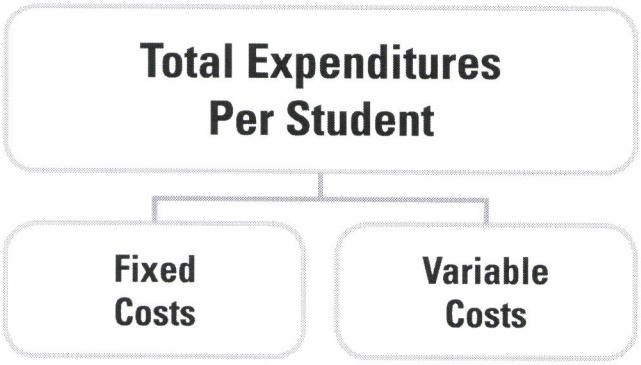
In this report, I use a different empirical approach. I start with the textbook definition of fixed and variable costs and then endeavor to decompose expenditure into components that are spent on fixed costs and components that are spent on variable costs. Whereas prior studies were econometric exercises, this study is an accounting exercise based on evidence of ways public school districts have reduced costs in response to decreases in the number of students they served.

The rest of this section seeks to make the connection between school choice programs where money follows the child to the school of his or her family's choice and the fiscal effects on local public school districts. When students leave a local public school district—for any reason, whether to go to another school district, to go to a charter or virtual school, or to go to a private school—which costs of educating those students are fixed costs and which costs are variable costs?

Textbook Treatment of Fixed and Variable Costs

An organization that produces a good or service must employ inputs to produce those goods or services. Some of those inputs vary directly with the amount the organization is producing. These inputs are called variable inputs. However, some inputs do not vary with the rate of output. That is, in order to produce at all, the organization needs a certain amount of these inputs. These inputs are called fixed inputs. If production decreases in a later time period, the amount of fixed inputs needed for production does not decrease. Likewise, if production increases in a later time period, the amount of fixed inputs needed for production does not increase. Since it costs money to employ inputs, the organization incurs variable costs when it employs variable inputs and incurs fixed costs when it employs fixed inputs. All costs to the organization are either fixed or variable, and fixed costs do not vary with the rate of production. Variable costs increase when production increases, and variable costs decrease when production decreases.

A public school, like any organization, has fixed costs and variable costs:



Textbooks say that in the long-run all costs are variable, while in the short-run costs such as labor are variable and capital costs are fixed.

The definition of fixed costs from the leading introductory textbook in economics, the 6th edition of "Principles of Economics" by N. Gregory Mankiw, is: "Some costs, called fixed costs, do not vary with the quantity of output produced" (266). So fixed costs do not change one penny when the output decreases or increases. In the long-run, all costs are variable. Mankiw continues:

> "Over a period of only a few months, Ford cannot adjust the number or size of its car factories. The only way it can produce additional cars is to hire more workers at the factories it already has. The cost of these factories is, therefore, a fixed cost in the short run. By contrast, over a period of several years, Ford can expand the size of its factories, build new factories, or close old ones. Thus, the cost of its factories is a variable cost in the long run. (271, emphasis added)"[10]

Any microeconomics or accounting textbook would have similar phraseology. The implication of this is that fixed costs are only fixed for a given period of time. In the long-run, all costs are variable.

A leading cost accounting textbook is by Charles T. Horngren et al., "Cost Accounting: A Managerial Emphasis." The Horngren text adds an important wrinkle to the concept of fixed costs. This wrinkle is termed "step" costs. Horngren et al. (2009) write that step costs "remain the same over various ranges of the level of activity, but the cost increases by discrete amounts—that is, increases in steps—as the level of the activity increases from one range to the next (353)."[11] Step costs are fixed over a range of production, but increase or decrease in a later time period if the amount of production deviates significantly from the present levels of production.

What we learn from leading textbooks in economics and accounting is that some costs do not vary with the rate of production; rather, some costs vary directly

with the rate of production, and some costs increase or decrease only in steps. Importantly, in the long-run all costs are variable as organizations can adjust to new and different levels of production by making new strategic decisions on resources.

Will Only One Student Leave When a New School Choice Program Begins?

When debating school choice programs in state legislatures, lobbyists for public school leadership and their allies routinely argue, "when one student leaves, we still have to pay for that student's teacher. We still have to pay for...." The implication of their argument is that all costs of running public schools are fixed. Interestingly, I have never heard that argument made when there is an increase in the number of students. If a public school adds only one student, do the lobbyists for public school leaders suggest that the district should not receive any extra funding? I suspect that has never happened. Regarding the quote below, do not expect public school lobbyists to understand this line of reasoning.

> *It is difficult to get a man to understand something when his salary depends on his not understanding it.*
>
> — Upton Sinclair

Nevertheless, this argument begs the question—how many students will leave a district in response to a school choice program? In addition, how many students will leave a school district in a given year for any reason? The number of students leaving is likely to be far greater than one. We can use past experience as a guide.

Milwaukee and Cleveland have voucher programs that offer a subset of their public school students (low-income students only) vouchers to attend a private school. The voucher amounts are quite low relative to the amounts spent per student in each district. The average voucher in Cleveland was $3,027 in FY 2010, while public schools spent over $14,500 per student. In Milwaukee, the average voucher amount was $6,442, while the public school district spent over $15,000 per student. In Cleveland in FY 2010, 11.3 percent of students exercised school choice with a voucher, while in Milwaukee 19.7 percent of students used a voucher. In both cities, there are caps on the number of students who may use a voucher to attend a school that their parents deem better. Thus, it appears that even limited school choice programs—with limited eligibility, enrollment caps, and relatively low voucher amounts—lead large percentages of students to leave a public school district. Therefore, the notion that a single student would leave via school choice appears to be a non sequitur. To the contrary, it appears that significant proportions of students will leave via school choice—and students may leave for myriad other reasons unrelated to school choice.

Put differently, and put in the words of cost accounting, a single student does not leave a school district in a given year; students leave in "steps."

Applying the Concepts of Fixed, Variable, and Step Costs to Schools

In this subsection, I endeavor to obtain a cautious overestimate of fixed costs for public schools.

The U.S. Department of Education's Common Core of Data (CCD) is the source of data on public school finances used in the following analysis and by researchers who want comparable and accurate data across states. The CCD contains, among many other items, financial data collected from state education agencies for all public school districts in the United States. The CCD separates all funds devoted to public schools into 12 categories. See the list on the following page.

Definitions of each of these cost categories are provided in Appendix 1.

Table 1 contains the total expenditures per student for

public education for each state. These expenditures per student come from the National Center for Education Statistics at the U.S. Department of Education for the most recent school year available, 2008-09. As shown in Table 1, for the U.S. as a whole, spending per student in public education was $12,450 for the 2008-09 academic year. I want to ascertain how much of the $12,450 are fixed costs and how much are variable costs and to construct an estimate of fixed and variable costs for each state.

Clearly, some of the $12,450 per student, such as capital expenditures and interest, are truly fixed costs in the short-run. That is, if some students left public education via school choice or moved to another state or district, for example, then capital costs and interest payments could not decrease immediately.

Cost Categories for Public School Districts

- Capital Expenditures
- Interest
- General Administration
- School Administration
- Operations & Maintenance
- Transportation
- "Other" Support Services
- Instruction
- Student Support
- Instructional Staff Support
- Enterprise Operations
- Food Service

TABLE 1 Expenditures Per Student for Each State, 2008-09 (All Costs Included)

State or Jurisdiction	Total Expenditures Per Student
United States	$12,450
Alabama	$10,642
Alaska	$18,058
Arizona	$9,607
Arkansas	$10,152
California	$11,397
Colorado	$10,669
Connecticut	$17,462
Delaware	$14,700
District of Columbia	$27,155
Florida	$11,097
Georgia	$11,468
Hawaii	$13,504
Idaho	$8,618
Illinois	$13,456
Indiana	$10,582
Iowa	$11,726
Kansas	$11,441
Kentucky	$10,501
Louisiana	$12,075
Maine	$13,368
Maryland	$15,113
Massachusetts	$15,728
Michigan	$11,987
Minnesota	$13,555
Mississippi	$8,948
Missouri	$11,728
Montana	$11,530
Nebraska	$12,715
Nevada	$10,501
New Hampshire	$13,418
New Jersey	$18,549
New Mexico	$11,849
New York	$19,983
North Carolina	$9,729
North Dakota	$11,043
Ohio	$12,871
Oklahoma	$8,716
Oregon	$11,514
Pennsylvania	$14,648
Rhode Island	$15,547
South Carolina	$11,667
South Dakota	$10,074
Tennessee	$8,895
Texas	$11,149
Utah	$8,640
Vermont	$16,035
Virginia	$12,264
Washington	$11,917
West Virginia	$11,305
Wisconsin	$12,843
Wyoming	$19,037

Source: National Center for Education Statistics, 2011

I submit that the following cost categories are, in the interest of creating an overestimate of fixed costs, best treated as fixed costs in the short-run: capital expenditures, interest, general administration, school administration, operations & maintenance, transportation, and "other" support services. Of course, if a significant number of students left a school district from one year to the next for any reason—suburbanization, large factory closes in a small town, scholarships to private schools, a new charter school opening, etc.—some of these costs could be reduced immediately. For example, a school losing a large number of students could reduce the number of assistant principals from two to one; there could be fewer bus routes; two schools could be merged into one, etc. However, my purpose here is to create a comfortable overestimate of fixed costs in order to provide cautious estimates of fixed costs. A cautious estimate allows us to be comfortable that school choice programs where "the money follows the child" can be designed in such a manner to improve the fiscal situation of public school districts.

While I treat capital expenditures, interest, general administration, school administration, operations and maintenance, transportation, and "other" support services as fixed costs in the short-run for the present analysis, all of these costs are variable in the long-run. For example, if a school district loses a lot of students and that loss appears to be long-term, the district does not need as many school buildings or as many assistant principals, and schools and school districts can consolidate.

The proper way to think about this issue is not whether public school districts have in the past reduced costs when students in large numbers left the district for any reason. The issue is whether they are able to do so. For decades in the United States, real (inflation-adjusted) spending per student and real resources increased in our public education system—regardless of whether school districts experienced an increasing or decreasing student population. Therefore, evidence that school districts increased expenditures when the number of students they served significantly decreased does not necessarily mean they cannot decrease expenditures when students leave. Perhaps they did not have to reduce expenditures when students left because one or more levels of government chose not to reduce taxpayer funding when students left, so the districts did not reduce expenditures.

The outstanding issue is whether the remaining cost categories—instruction, student support, instructional staff support, enterprise operations, and food service—are variable costs, even in the short-run. Put differently, if a significant number of students left a public school district for any reason from one year to the next, is it feasible for the district to reduce the costs of these items commensurate with the decrease in its student population?

I answer this question with financial data from two large and two small school districts and show that school districts can reduce these expenditures when students leave. I also provide logic and intuition as to how school districts can reduce these costs.

Example of Two Large School Districts Losing Students and Reducing Costs

Between the 2003-04 and 2009-10 school years, the state of Georgia added almost a million residents and the public education system statewide experienced an increase in its student population of about 150,000 students, over a 9 percent increase. At the same time, Atlanta Public Schools (APS) lost over 3,000 students, almost a 6.6 percent decrease. Very little of this decrease in students was due to school choice programs where the money follows the child. Almost all of it was due to suburbanization, as families moved from the city of Atlanta to nearby suburbs. Table 2 shows the changes in students and staffing at APS over this time period.

As APS was losing 6.57 percent of its students, it decreased its teacher force by 6.84 percent. APS also decreased support personnel by 4.3 percent. Thus, APS was able to reduce its teaching plus support personnel (shown in the last column) by 6.62 percent over this time period—just a bit more than the percentage drop in its student population. It is possible for a large school system to reduce its instruction and support expenses proportionately to a drop in student population.

TABLE 2 Atlanta Public Schools (APS), FY 2004 and FY 2010

Fiscal Year	Number of Students	Number of Teachers	Number of Administrators	Number of Support Personnel	Teachers Plus Support Personnel
2004	51,315	4,010	395	382	4,392
2010	47,944	3,736	471	366	4,101
Change '04 to '10	-6.57%	-6.84%	19.22%	-4.30%	-6.62%

Source: (Georgia) Governor's Office of Student Achievement

It is worth mentioning that while APS was losing over 6 percent of its student population, it increased the number of administrators (assistant superintendents, area superintendents, assistant principals, etc.) by over 19 percent.

If a school district says that it cannot reduce its teacher force or support personnel in response to a decrease in its student population, it appears that there are an adequate number of administrators in the Atlanta Public School system who could explain to them how it was done in APS.

While a large school district may be able to reduce costs over several years in response to a decrease in its student population, can a large school district reduce costs from one school year to the next? APS was able to reduce teaching and support personnel more than proportionately to its loss of students between FY 2004 and FY 2005. However, I choose to use a different example in the interest of showing that there are significant variable costs in public education—even from one year to the next. That example is Dougherty County (GA) Public Schools (DCPS).

Between FY 2009 and FY 2010, Dougherty County lost a tiny fraction of its enrollment, 0.7 percent. Its enrollment fell from 15,946 to 15,838 students from FY 2009 to FY 2010. This constitutes a loss of only 108 students from such a large school district. This situation is a classic example used by opponents of school choice to suggest that virtually all expenditures made by public schools cannot be reduced from one year to the next in response to a reduction in students. That said, Dougherty County was able to reduce teaching and support personnel more than commensurate with its small loss in students.

While Dougherty was losing a minuscule 0.7 percent of its students from one year to the next, it was able to reduce its teaching staff by 4.5 percent, and support staff by 0.5 percent (see Table 3). Together, teaching and support staff declined by 4.1 percent from one year to the next. Reducing costs—even from one year to the next—is possible in public education.

Examples of Two Small/Rural School Districts Losing Students and Reducing Costs

Some may suggest that a large school district may have the flexibility to reduce costs when students leave, but a small or rural school district would not. Let me concede a point before I show that a small

TABLE 3 Dougherty County (Georgia) Public Schools, FY 2009 and FY 2010

Fiscal Year	Number of Students	Number of Teachers	Number of Administrators	Number of Support Personnel	Teachers Plus Support Personnel
2009	15,946	1,120.15	87.54	110.97	1,231.12
2010	15,838	1,070.28	87.05	110.46	1,180.74
Change '09 to '10	-0.7%	-4.5%	-0.6%	-0.5%	-4.1%

Source: (Georgia) Governor's Office of Student Achievement

and rural school system can reduce its expenditures when students leave. Very tiny school districts with one or two teachers per grade perhaps cannot reduce costs proportionately in all cases where the district experiences a significant decrease in students. They may be able to decrease expenditures proportionately, but likely not always.

A school district with two classes per grade and thirty students per class, or an even smaller school district, may not be able to reduce its expenditures on instruction, student support, instructional staff support, enterprise operations, and food service proportionately to a decrease in its student population. If 10 students in a particular grade left this hypothetical small school district, the district would not be able to reduce its teaching force for that grade from two to one teacher, as the number of students in the grade would have decreased from 60 to 50 students.

For a district that serves students in grades K-12, we have in my example 60 students times 13 grades, or 780 total students. Thus, I am not claiming that the analysis here applies to school districts with 780 or less students. In my state of Georgia, there are 11 school districts with 780 students or less. A few of these 11 share the same high school—that particular high school serves students from several of these districts. These 11 districts serve a total of 5,584 students, and this amount is less than four-tenths of 1 percent of the student population in Georgia. Thus, the analysis in this paper only applies to over 99.66 percent of the public school population in Georgia. Given the consolidation of public schools and public school districts over the past century or so, there are likely very few students in tiny school districts in your state as well.[12]

A small school district, Wheeler County Public Schools in rural south Georgia, lost 12.1 percent of its student population between FY 2004 and FY 2010. As shown in Table 4, Wheeler County Public Schools was able to reduce its teaching force by 15.6 percent over this time period. However, support personnel remained constant during this time period. Teachers and support personnel decreased by 14.4 percent as the school district lost 12.1 percent of their students. As Table 4 shows, even a very small school district can reduce its teaching and support personnel in response to a decrease in its student population. In addition, Wheeler was able to reduce its number of administrators by one, from seven administrators to six.

The example of Wheeler County, Georgia begs the question: Can a small rural school district reduce costs significantly from one year to the next when they lose students? The answer for Hancock County, Georgia is "yes."

Between FY 2009 and FY 2010, Hancock County Public Schools lost 5.3 percent of its enrollment (see Table 5). Hancock County schools had 1,255 students in the 2008-09 academic year, but only 1,189 students in 2009-10. This is a significant loss of students from one year to the next for such a small school system. And this is exactly the situation that opponents of school choice highlight to suggest that there is no possible way for such a small school system to reduce costs when they lose students.

Despite the challenge of reducing costs in a small school system, Hancock County Public Schools (HCPS) did. After losing 5.3 percent of students from one year to the next, Hancock County was able to reduce its teaching staff by 8.8 percent. However, the number

TABLE 4 Wheeler County (Georgia) Public Schools, FY 2004 and FY 2010

Fiscal Year	Number of Students	Number of Teachers	Number of Administrators	Number of Support Personnel	Teachers Plus Support Personnel
2004	1,071	89	7	7	96
2010	941	75.13	6	7	82.13
Change '04 to '10	-12.1%	-15.6%	-14.3%	0.0%	-14.4%

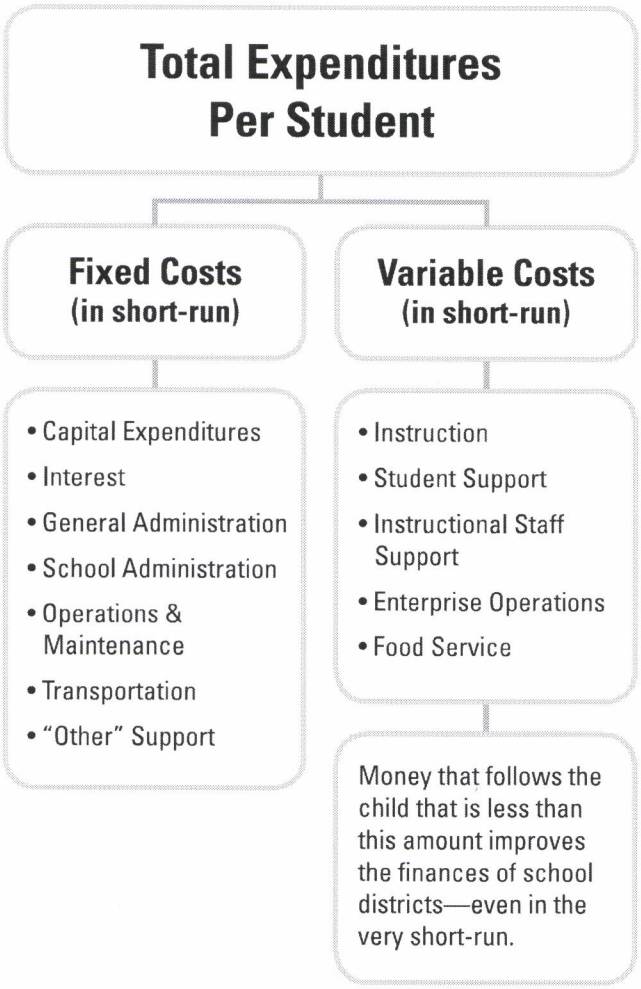
Source: (Georgia) Governor's Office of Student Achievement

TABLE 5 Hancock County (Georgia) Public Schools, FY 2009 and FY 2010

Fiscal Year	Number of Students	Number of Teachers	Number of Administrators	Number of Support Personnel	Teachers Plus Support Personnel
2009	1,255	98.07	13.86	8.02	106.09
2010	1,189	89.45	11.26	10.02	99.47
Change '09 to '10	-5.3%	-8.8%	-18.8%	24.9%	-6.2%

Source: (Georgia) Governor's Office of Student Achievement

of support staff increased by two individuals (24.9 percent). Taken together, HCPS reduced its support plus teaching staff by 6.2 percent from one year to the next when the student population was reduced by 5.3 percent. Thus, we have an example of a very small school system that was able to reduce teaching and support personnel more than commensurate with its reduction of students—even from one school year to the next. It should be noted that HCPS also reduced its administrative staff by 2.6 personnel (18.8 percent) from FY 2009 to FY 2010. Together, HCPS reduced its support and administrative staff by a net of 0.6 personnel.



The examples of Atlanta Public Schools, Dougherty County Public Schools, Wheeler County Public Schools, and Hancock County Public Schools in Georgia show that it is possible for school districts—large and small—to reduce instructional and support costs more than proportionately in response to a reduction in their student populations. Food service and enterprise costs can be reduced as students leave because there are fewer students to serve. Workers employed in these and other support endeavors were reduced in the examples above.

Again, the analysis here is overly cautious. It is difficult to believe that the costs that I label as fixed in the short-run cannot be reduced at all in response to a decrease in students.

Cautious Estimates of Short-run Fixed and Variable Costs for Each State and D.C.

Based on the reasoning and evidence provided above, I separate total public school expenditures into costs that are fixed in the short-run and costs that are variable in the short-run. The cost components that are fixed and variable in the short-run are found in the figure to the left.

The analysis provides a cautious overestimate of the amount of money that can follow the child to the school of his or her parents' choice and not fiscally harm the child's former public school. The estimates of short-term fixed and short-term variable costs for each state are found in Table 6.

TABLE 6 Short-run Fixed and Variable Costs by State, 2008-09

State or Jurisdiction	Total Expenditures Per Student	Short-run Fixed Costs	Percent of Total Costs that are Short-run Fixed Costs	Short-run Variable Costs	Percent of Total Costs that are Short-run Variable Costs
United States	$12,450	$4,483	36.0%	$7,967	64.0%
Alabama	$10,642	$3,835	36.0%	$6,807	64.0%
Alaska	$18,058	$6,883	38.1%	$11,175	61.9%
Arizona	$9,607	$3,715	38.7%	$5,892	61.3%
Arkansas	$10,152	$3,359	33.1%	$6,793	66.9%
California	$11,397	$4,229	37.1%	$7,168	62.9%
Colorado	$10,669	$4,370	41.0%	$6,299	59.0%
Connecticut	$17,462	$5,925	33.9%	$11,537	66.1%
Delaware	$14,700	$6,088	41.4%	$8,612	58.6%
District of Columbia	$27,155	$14,134	52.0%	$13,021	48.0%
Florida	$11,097	$4,357	39.3%	$6,740	60.7%
Georgia	$11,468	$3,961	34.5%	$7,507	65.5%
Hawaii	$13,504	$3,623	26.8%	$9,881	73.2%
Idaho	$8,618	$3,223	37.4%	$5,395	62.6%
Illinois	$13,456	$4,999	37.1%	$8,457	62.9%
Indiana	$10,582	$4,014	37.9%	$6,568	62.1%
Iowa	$11,726	$4,082	34.8%	$7,644	65.2%
Kansas	$11,441	$3,749	32.8%	$7,692	67.2%
Kentucky	$10,501	$3,723	35.5%	$6,778	64.5%
Louisiana	$12,075	$4,276	35.4%	$7,799	64.6%
Maine	$13,368	$4,250	31.8%	$9,118	68.2%
Maryland	$15,113	$4,756	31.5%	$10,357	68.5%
Massachusetts	$15,728	$4,198	26.7%	$11,530	73.3%
Michigan	$11,987	$4,436	37.0%	$7,551	63.0%
Minnesota	$13,555	$5,050	37.3%	$8,505	62.7%
Mississippi	$8,948	$2,977	33.3%	$5,971	66.7%
Missouri	$11,728	$4,421	37.7%	$7,307	62.3%
Montana	$11,530	$4,004	34.7%	$7,526	65.3%
Nebraska	$12,715	$4,228	33.3%	$8,487	66.7%
Nevada	$10,501	$4,450	42.4%	$6,051	57.6%
New Hampshire	$13,418	$3,713	27.7%	$9,705	72.3%
New Jersey	$18,549	$5,792	31.2%	$12,757	68.8%
New Mexico	$11,849	$4,608	38.9%	$7,241	61.1%
New York	$19,983	$6,242	31.2%	$13,741	68.8%
North Carolina	$9,729	$3,157	32.4%	$6,572	67.6%
North Dakota	$11,043	$3,795	34.4%	$7,248	65.6%
Ohio	$12,871	$4,924	38.3%	$7,947	61.7%
Oklahoma	$8,716	$2,855	32.8%	$5,861	67.2%
Oregon	$11,514	$4,483	38.9%	$7,031	61.1%
Pennsylvania	$14,648	$5,639	38.5%	$9,009	61.5%
Rhode Island	$15,547	$4,065	26.1%	$11,482	73.9%
South Carolina	$11,667	$4,551	39.0%	$7,116	61.0%
South Dakota	$10,074	$3,790	37.6%	$6,284	62.4%
Tennessee	$8,895	$2,687	30.2%	$6,208	69.8%
Texas	$11,149	$4,705	42.2%	$6,444	57.8%
Utah	$8,640	$3,448	39.9%	$5,192	60.1%
Vermont	$16,035	$4,487	28.0%	$11,548	72.0%
Virginia	$12,264	$3,967	32.3%	$8,297	67.7%
Washington	$11,917	$4,576	38.4%	$7,341	61.6%
West Virginia	$11,305	$3,418	30.2%	$7,887	69.8%
Wisconsin	$12,843	$4,547	35.4%	$8,296	64.6%
Wyoming	$19,037	$8,167	42.9%	$10,870	57.1%

Source: National Center for Education Statistics, 2011, Author's Calculations

As shown in Table 6, for the U.S. as a whole, on average 64 percent of the $12,450 spent per student can be comfortably considered as variable costs, even in the short-run. That translates into $7,967 per student.

The dollar amount of variable costs per student varies widely across states for two reasons. First, some states devote more taxpayer funding to public education relative to others. Second, some states spend much higher proportions of their education dollars on instruction (a variable cost) relative to other states. New York has the highest dollar amount of short-run variable costs per student at $13,741 per student. Utah has the lowest, at $5,192 of short-term variable costs per student.

The implication of the analysis above is that a school choice program in New York, for example, where $13,741 per student or less followed the child to the school of his or her choice would not fiscally harm the child's former public school. Furthermore, based on the evidence regarding competition and the evidence regarding the wide variance in the effectiveness of teachers (discussed in Appendix 2), it is likely that school choice programs that offer a significant amount of choice would increase the quality of education offered in the public schools.

When they design new school choice programs, policymakers can update the dollar amounts in Table 6 as newer data become available. Such information will allow policymakers to design school choice programs that do not decrease resources available to students who remain in public schools. As a given school choice program matures, all taxpayer funds devoted to K-12 education can "follow the child" as all public school costs can be considered as variable costs—new schools do not need to be opened, districts and schools can consolidate, etc.

Conclusions

Public schools leaders often suggest that students who remain in traditional public schools would be harmed (a) academically and (b) fiscally under school choice programs.

Does Enhanced School Choice Cause Academic Harm to Students Who Remain in Public Schools?

No. The large body of evidence on this first claim is one-sided—competition that results from school choice either improves or has no effect on the academic outcomes of students who remain in traditional public schools. Thus, the benefits of competition—providing incentives for schools to be excellent or risk losing students and funding—appear to overcome any cream-skimming of the best students out of public education that public educators suggest would be the result of school choice. Please see Appendix 2 for an extended presentation of this issue.

Does School Choice Cause Fiscal Harm that Impacts Students Who Remain in Public Schools?

Public school leaders routinely suggest in legislative and public debates over school choice that when any student leaves a public school to attend a charter school, a virtual school, or a private school and taxpayer funds are redirected to the child's new school, that the child's former public school is harmed fiscally. The claim is that when a child leaves via school choice that the public school retains significant fixed costs. Fewer students means that there is less money to spend on these large fixed costs of operating a school. So, if students leave and these fixed costs are truly fixed and must be paid in order for the school to operate, then the students who remain in public schools will have fewer resources devoted to their education.

To analyze the fiscal effect of school choice on public school districts, I use evidence and logic to construct a cautious overestimate of short-run fixed costs per student for public schools for each state and the District of Columbia.

While I treat capital expenditures, interest, general administration, school administration, operations and maintenance, transportation, and "other" support

services as fixed costs in the short-run for the present analysis, all of these costs are variable in the long-run. For example, if a school district loses a lot of students and that loss appears to be long-term, it does not need as many school buildings or as many assistant principals, and schools and school districts can consolidate, etc. Even in the short-run, school districts are able to reduce these costs, although likely not proportional to the loss of students.

The question for this study is whether instruction, student support, instructional staff support, enterprise operations, and food service are variable costs, even in the short-run. Put differently, if a significant number of students left a public school district for any reason from one year to the next, is it feasible for the district to reduce the costs of these items commensurate with the decrease in its student population? The answer that comes from analyzing the finances of two large and two small school districts that lost students is "yes." Both the two large school districts and the two smaller ones were able to reduce the combination of instructional and support expenses at a higher rate than their loss in students. Thus, these costs were variable in the short-run—even from one year to the next.

The United States' average spending per student was $12,450 for the 2008-09 academic year. I estimate that 36 percent of these costs can be considered fixed in the short-run. The remaining 64 percent, or $7,967 per student, are considered variable costs, even in the short-run. The implication of this finding is that a school choice program where less than $7,967 per student is redirected from a child's former public school to another school of his or her parents' choosing would actually improve the fiscal situation of the public school district. Table 6 of this report provides analogous estimates for each state and the District of Columbia.

School districts in your state that say they cannot reduce costs when students leave due to school choice or for any other reason could consult with one of the four districts featured in this report to find out how they did it. Alternatively, they could read the interesting volume "Stretching the School Dollar: How Schools and Districts Can Save Money While Serving Students Best" (2010), edited by Frederick M. Hess and Eric Osberg.[13]

Appendix 1

Definitions of Cost Categories in the Common Core of Data (CCD)

Instruction

The sum of all instructional expenditures except property expenditures. Instruction expenditures are for services and materials directly related to classroom instruction and the interaction between teachers and students. Teacher salaries and benefits, textbooks, classroom supplies and extracurricular activities are included in instruction. Expenditures for the library and in-service teacher training are reported as instruction support services. Guidance counselors and nurses are reported under student support services. These data are taken from the National Public Education Financial Survey.

Capital Expenditures

Construction spending includes expenditures for the construction of fixed assets. These data are taken from the CCD LEA Finance (F-33) survey.

Enterprise Operations

Enterprise operations spending includes expenditures for business-like activities such as a bookstore, where the costs are recouped largely with user charges. These data are taken from the CCD LEA Finance (F-33) survey.

General Administration

This is the sum of all expenditures for school district administration, including boards of education and their staff and executive administration. Also included are expenditures for legal activities in interpretation of laws and statutes, and general liability situations. These data are taken from the CCD National Public Education Financial Survey.

Food Service

This is the sum for all expenditures associated with providing food services excluding property expenditures. These data are taken from the CCD National Public Education Financial Survey.

Interest

Interest on debt payments include all expenditures for interest incurred on both long-term and short-term indebtedness of the school system, excluding principal payments. These data are taken from the CCD LEA Finance (F-33) survey.

School Administration

This is the sum of all support services expenditures for school administration excluding property expenditures. These data are taken from the CCD National Public Education Financial Survey.

Transportation

This is the sum of all support services expenditures for student transportation excluding property expenditures. These data are taken from the CCD National Public Education Financial Survey.

Student Support Services

This is the sum of all support services expenditures for students excluding property expenditures. These data are taken from the CCD National Public Education Financial Survey.

Other Support Services

Expenditures for dues and fees for membership by instructional staff in professional and other organizations. Miscellaneous expenditures for goods and services are also included. These data are taken from the CCD National Public Education Financial Survey.

Instruction Staff Support

Expenditures for benefits to supervisors of instruction (not department chairs), library and media center staff, computer lab staff, curriculum coordinators, and in-service teacher training staff. Benefits are expenditures made in addition to gross salary and not paid directly to employees. They include amounts paid on behalf of an LEA for fringe benefits such as group insurance, social security contributions, retirement contributions, tuition reimbursements, unemployment compensation, worker's compensation, and other employee benefits. These data are taken from the CCD National Public Education Financial Survey.

Operations & Maintenance

This is the sum of all support services expenditures for operations and maintenance excluding property expenditures. These data are taken from the CCD National Public Education Financial Survey.

Appendix 2

Does Enhanced School Choice Cause Academic Harm to Students Who Remain in Public Schools?

One proposition often made by proponents of the current public education system is that increased school choice may have unintended negative effects on public schools if it draws away the most involved families from public schools and the monitoring of those schools decreases, allowing public schools to reduce the effort put into educating students. They also suggest that there are peer effects in the production of education—one student's academic outcomes are partially determined by the quality of their student peers. There is evidence of peer effects in education (Clark et al., 2011). If enhanced school choice leads to a net decrease in peer quality in public schools, then the academic outcomes for students who remain in public schools could decline.

Proponents of greater school choice suggest that greater school choice will lead to more competition for students among schools. This increased competition would give public school leaders the incentive to improve the performance of public schools in order to limit the number of students whose families desire to exercise school choice. Thus, the increase in competition and choice would increase the quality of the education offered in public schools.

These school choice advocates are often persuaded by the effects of competition in many areas such as the large decrease in the prices of airline tickets after competition was allowed in 1978. They see the intense competition in technology industries that have led to new and innovative products like smart phones and iPads. Competition in long distance service has reduced the prices of long distance calls from 25 cents per minute or more to an almost zero price in a generation. Even in my little town of Milledgeville, Georgia, the new Little Caesar's Pizza that opened in July 2011 with their $5 large pizzas led to the local Papa John's and Domino's to reduce the prices of their pizzas within days. Innovations in health care technologies and prescription drugs have prolonged and improved the quality of all of our lives. Those of us with allergies are much better off with the new medicines like Claritin, Allegra, and Zyrtec that successfully combat the symptoms of our allergies without making us drowsy—the old over-the-counter medicines like Benadryl made many drowsy. It seems that in almost every aspect of life, competition has led to lower prices, higher quality, more diversity of offerings, and exciting innovations that have benefited us all tremendously. Why can't competition do the same for education?

I have just laid out two competing arguments. The first argument is that competition and choice in education will cream skim the best students and families out of public education and harm the education of the students who remain in public schools. The second argument is that competition and choice will lead to a tide that improves the quality of all schools. Which argument is correct?

To date, the empirical evidence on the topic suggests that school choice proponents are correct. All forms of enhanced school choice tried in the United States have led to an improvement in academic outcomes for students who remain in public schools or have led to no effect on academic outcomes for students who remain in public schools. The most recent empirical study on the topic is by Figlio and Hart (2010).[14] They report: "We find evidence that public schools subject to more competitive pressure from private schools raised their test scores the most following the introduction of Florida's program." They found that the greater the competition from Florida's tax-credit scholarship program, the larger the benefits to Florida public school students. In a summary piece on the empirical research on this issue for the Friedman Foundation for Educational Choice, Forster (2011) writes:

> "Contrary to the widespread claim that vouchers do not benefit participants and hurt public schools, the empirical evidence consistently shows that vouchers improve outcomes for both participants and public schools. In addition to helping the participants by giving them more options, there are a variety of explanations for why vouchers might improve public schools as well. The most important is

that competition from vouchers introduces healthy incentives for public schools to improve."[15]

No study finds any evidence of academic harm for students who remain in public schools due to enhanced school choice. Thus, the evidence on this issue is one-sided—greater school choice does not harm academic outcomes for students who remain in public schools.

How Can Public Schools Lose Students, Lose Funding, and Increase School Quality?

It is counterintuitive to some that competition and choice could improve traditional public schools. Public schools are likely to lose students and funding when money follows the child to alternatives to the traditional public education system. In this subsection, I provide a specific mechanism that explains the empirical findings that greater school choice seems to have no negative effect and often improves academic outcomes for students who remain in public schools. The mechanism is an improvement in teacher effectiveness.

Rivkin et al. (2005), Koedel and Betts (2011), and many other careful empirical studies document the wide disparity in teaching effectiveness within the public education system.[16] Based on these results, Hanushek (2010) reports:

> "Literally hundreds of research studies have focused on the importance of teachers for student achievement. Two key findings emerge. First, teachers are very important; no other measured aspect of schools is nearly as important in determining student achievement. Second, it has not been possible to identify any specific characteristics of teachers that are reliably related to student outcomes."

Hanushek continues:

> "Some teachers year after year produce bigger gains in student learning than other teachers. The magnitude of the differences is truly large, with some teachers producing 1½ years of gain in achievement in an academic year while others with equivalent students produce only ½ year of gain. In other words, two students starting at the same level of achievement can know vastly different amounts at the end of a single academic year due solely to the teacher to which they are assigned. If a bad year is compounded by other bad years, it may not be possible for the student to recover. No other attribute of schools comes close to having this much influence on student achievement. The available estimates for, say, class size reduction, do not suggest any leverage past the earliest grades of school, and then the expected effects are small."[17]

In an earlier piece, Hanushek (2002) put the results regarding the large differences in teacher effectiveness in context:

> "We can also return to the popular argument that family background is overwhelmingly important and that schools cannot be expected to make up for bad preparation from home. The latter estimates of teacher performance suggest that having three years of good teachers (85th percentile) in a row would overcome the average achievement deficit between low-income kids (those on free or reduced-price lunch) and others. In other words, high quality teachers can make up for the typical deficits that we see in the preparation of kids from disadvantaged backgrounds."[18]

Given the wide disparity in teacher quality, as public schools lose students via school choice or for any other reason, they have a tremendous opportunity to improve the quality of their schools. When students leave, schools can lay off the least effective teachers. The students who remain would be reallocated to more effective teachers and their academic achievement would increase significantly. There is evidence that principals can identify the most and least effective teachers at their schools. Jacob and Lefgren (2005) report that "principals appear quite good at identifying those teachers who produce the largest and smallest standardized achievement gains in their schools...."[19]

However, in many cases—especially at schools that serve disadvantaged students—public schools may

not need to lay off as many teachers as one may think. The reason is teacher attrition. Nationally, according to the National Center for Education Statistics at the U.S. Department of Education, 15.4 percent of public school teachers left their schools during 2008-09. Teachers leave schools for many reasons. Importantly, Boyd et al. (2008) find that the least effective teachers are more likely to leave their schools.[20] Scafidi et al. (2007) and other studies find that teacher attrition is higher at schools that serve more disadvantaged students.[21] Thus, it is likely that public schools would not have to lay off a proportion of teachers equal to the proportion of students who exit the school because many of these teachers, including the weakest teachers, leave of their own volition.

Given that teacher effectiveness seems to be the key to schools offering a high quality education, school choice programs would provide an opportunity for public schools to improve. Empirically, it is often the case that public schools do improve in response to competition and choice. Also, there is no evidence that students who remain in public schools are harmed by greater school choice. Perhaps an increase in teacher quality explains these findings.

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Notes

1. Robert M. Costrell, "The Fiscal Impact of the Milwaukee Parental Choice Program in Milwaukee, Wisconsin, 1993-2008," (Fayetteville, AK: School Choice Demonstration Project Milwaukee Evaluation Report #2, University of Arkansas, 2008). Robert M. Costrell, "The Fiscal Impact of the Milwaukee Parental Choice Program: 2010-2011 Update and Policy Options," (Fayetteville, AK: School Choice Demonstration Project Milwaukee Evaluation Report #2, University of Arkansas, 2010).

2. For a review of this literature, please see Kane, Thomas J., Jonah Rockoff and Douglas Staiger, "What Does Certification Tell Us about Teacher Effectiveness?: Evidence from New York City," Economics of Education Review (2008), Vol. 27, No. 6, pp. 615-31.

3. Rajashri Chakrabarti, "Can Increasing Private School Participation and Monetary Loss in a Voucher Program Affect Public School Performance? Evidence from Milwaukee," (New York: Federal Reserve Bank of New York, 2007).

4. In a careful and detailed study, Nobel-prize winning economist James Heckman and Paul LaFontaine (2010) have shown that public high school graduation rates peaked in the late 1960s and have since declined. Despite these lower graduation rates, states have reported to the public and the federal government much higher graduation rates (Scafidi and Erwin, 2011). Hanushek (2006) and others have bemoaned that despite large real increases in taxpayer spending per student, public school students have had roughly stagnant scores on the National Assessment for Education Progress exams since the early 1970s. According to the U.S. Department of Education, real (inflation-adjusted) spending per student increased by more than 160 percent over the past 40 years (Digest of Education Statistics, 2010). The U.S. Department of Education's summary of American students' achievement in math relative to other countries on the international PISA exam is "Among the 33 other OECD countries, 17 countries had higher average scores than the United States, 5 had lower average scores, and 11 had average scores not measurably different from the U.S. average. Among the 64 other OECD countries, non-OECD countries, and other education systems, 23 had higher average scores than the United States, 29 had lower average scores, and 12 had average scores not measurably different from the U.S. average score." (National Center for Education Statistics, 2011). Achievement in mathematics has been shown in many studies to be an important predictor of future labor market productivity and earnings (see, for example, Johnson and Neal, 1998). While mathematics achievement in the U.S. is not at the top in international comparisons, education spending per student is. Only two out of 31 OECD countries spend more per student on elementary and secondary public schools students than the U.S. (2010 Digest of Education Statistics). In the conclusion to its policy statement on education, the U.S. Chamber of Commerce says, "Unless America makes dramatic improvements in education and workforce training, it will pay a terrible price, risking its place as an economic superpower and its identity as a striving, middle-class democracy."

5. Costrell (2008, 2010).

6. Ibid.

7. Ibid.

8. Ibid.

9. Brian Gottlob, "The Fiscal Impact of Tax-Credit Scholarships in Oklahoma." (Indianapolis, Friedman Foundation for Educational Choice, 2011).

10. N. Gregory Mankiw, "Principles of Economics," (Mason, OH: 6th Edition, South-Western, Cengage Learning, 2012).

11. Charles T. Horngren et al., "Cost Accounting. A Managerial Emphasis," (Upper Saddle River, NJ: 13th Edition, Pearson, Prentice Hall).

12. Although I do make this concession regarding tiny school districts, perhaps I should not. Think about a single start-up charter school. Suppose that charter school lost students because a new charter school opened, a new private school choice plan was created, or the local traditional public school improved significantly. Would policymakers and education experts be concerned that this start-up charter school was losing an amount of funding directly proportional to its loss of students and it could not cover its fixed costs? I don't think so either. If a charter school can manage the loss of students, why can't a traditional public school? Also, the incentive properties of competition and choice are strong—schools, private or public, traditional or charter, have a strong financial incentive to provide an excellent education when the money follows the child. If they do not provide an excellent education, they risk students fleeing to schools that do. Further, Chakrabarti (2007) showed that only when choice was expanded and the monetary loss per student to Milwaukee Public Schools (MPS) increased did students who remain in MPS experience the benefits of competition in terms of increased student achievement. While I do concede that the analysis here may not apply to tiny school districts, competition and choice may have beneficial effects for these districts as well.

13. Frederick M. Hess and Eric Osberg, "Stretching the School Dollar: How Schools and Districts Can Save Money While Serving Students Best," (Cambridge, MA: Harvard Education Press, 2010).

14. David M. Figlio and Cassandra M. D. Hart, "Competitive Effects of Means-Tested School Vouchers," (Cambridge, MA: National Bureau of Economic Research, WP 16056, 2010).

15. Greg Forster, "A Win-Win Solution: The Empirical Evidence on School Vouchers," (Indianapolis, Friedman Foundation for Educational Choice, 2011).

16. Steven G. Rivkin, Eric A. Hanushek, and John A. Kain, "Teachers, Schools, and Academic Achievement," Econometrica, 73 (2005): pp. 417-458. Cory Koedel and Julian R. Betts, "Does Student Sorting Invalidate Value-Added Models of Teacher Effectiveness? An Extended Analysis of the Rothstein Critique," The Journal of Education Finance and Policy 6(1): (2011): pp. 18-42.

17. Eric A. Hanushek, "The Economic Value of Higher Teacher Quality" (Chicago: National Bureau of Economic Research), Working Paper #16606.

18. Eric A. Hanushek, "Teacher Quality," (Palo Alto, CA: Hoover Institution Press, 2002).

19. Brian A. Jacob and Lars Lefgren, "Principals as Agents: Subjective Performance Measurement in Education," (Cambridge, MA: Harvard University, 2005).

20. Donald Boyd et al., "Who Leaves? Teacher Attrition and Student Achievement," (Chicago: National Bureau of Economic Research), Working Paper # 14022.

21. Benjamin Scafidi, David Sjoquist, and Todd Stinebrickner, "Race, Poverty, and Teacher Mobility," Economics of Education Review 26 (2) (2007): pp 145-59.

About the Author

Ben Scafidi is an associate professor of economics and director of the Economics of Education Policy Center at Georgia College & State University. He is also a fellow with the Friedman Foundation for Educational Choice and the director of education policy for the Georgia Community Foundation, Inc. His research has focused on education and urban policy. Previously, he has served as chair of the state of Georgia's Charter Schools Commission, the education policy advisor to Gov. Sonny Perdue, on the staff of both of Gov. Roy Barnes' Education Reform Study Commissions, and as an expert witness for the state of Georgia in school funding litigation. He received his Ph.D. in economics from the University of Virginia and his B.A. in economics from the University of Notre Dame. Ben and Lori Scafidi and their four children reside in Milledgeville, Georgia.

I thank Jeff Reed, Dillon Barker, Susan Meyers, Paul DiPerna, Amy Saxon, and Tennessee State Sen. Brian Kelsey for helpful conversations. All remaining errors are mine.

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One American Square
Suite 2420
Indianapolis, IN 46282
(317) 681-0745
edchoice.org

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