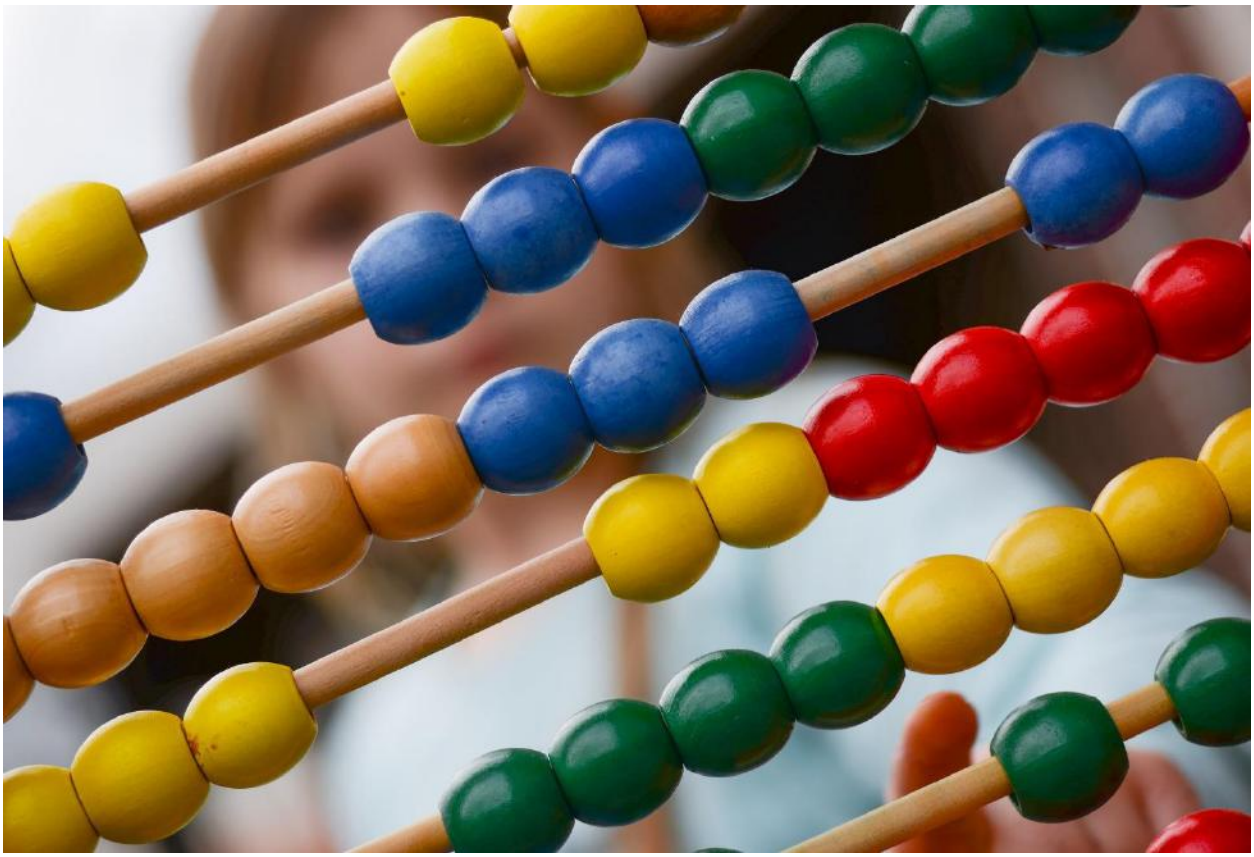
The Economics of Building a Voucher Or Educational Savings Account Program in Georgia



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Executive Summary

The economics of vouchers and educational savings accounts (ESAs, also known as educational scholarship accounts) are central to their political success because attracting sufficient political support for such educational choice programs depends at least partially on persuading opponents that these programs will not deprive schools of needed funding for the remaining students.

The economic concept at the heart of this dispute is marginal cost. Marginal cost, in the education context, is the additional cost incurred from educating one more student (or the amount expenditures can be reduced if educating one fewer student). If vouchers or ESAs remove funding from a school's budget at a rate less than the marginal cost, the school district is in a stronger financial position, able to spend more money on the average remaining student.

To examine the financial feasibility of vouchers and education savings accounts in Georgia, a cost function is estimated using data on Georgia's 159 county school districts.[1] The resulting estimated model allows computation of the marginal cost of educating a student for each district. The resulting marginal-cost estimates are quite high, ranging from a low of $6,241 to a high of $11,851.

These values are then compared to easier-to-compute, and widely reported, figures such as the average variable cost per student and the state funding per pupil by district. Importantly, the marginal cost is higher than both average variable cost and state funding per pupil in almost every district. That finding suggests two easy ways to construct financially viable voucher and ESA programs in Georgia.

This report's most important finding is, thus, that voucher and ESA programs that provide funding in amounts equal to a district's state funding per pupil actually raise the district's financial capacity to educate its remaining students because the programs would remove less money than the district saves by having fewer students to educate. In addition, this report reveals that in all except the smallest districts, vouchers or ESAs could be funded up to the level of average variable cost and leave more than enough money to educate the remaining students at the same expenditure level as before.

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[1] Georgia has 181 school districts, including counties and cities, but due to difficulty obtaining data for some variables used in this study for some city districts, the results presented are confined to the county districts.

"When parents have the ability to select the best learning environment for their kids, they thrive and so do their communities."

John Boehner, *former Speaker, U.S House of Representatives*

With about 50 million children attending public K-12 schools at an average cost of over $13,000 per student annually, the United States spends nearly $700 billion each year on public K-12 education.[2] Given the importance and financial enormity of public education, parents and taxpayers rightly want and deserve some accountability. Yet parents often have no control over which schools their children attend and taxpayers have little assurance their hard-earned money is being spent wisely by their local school systems.

What is needed is a mechanism to give parents more control over their children's education and taxpayers a reason to believe education dollars are being well spent. One way to accomplish both goals is school choice.

School choice can incorporate a wide variety of policies but mostly means either vouchers, education savings accounts (ESAs, sometimes referred to as education scholarship accounts), or parental choice from some subset of local public schools, including public charter schools. Parental choice programs typically allow parents to enroll their children in one of several schools in their area as opposed to automatically being assigned to a specific school based on their home address. Such programs have several flavors, but very often they restrict parents to public schools within the same (city or county) school district.

Vouchers provide parents with some amount of money (or credit) that can be used to enroll their children either in a public or private school. Vouchers may allow students to cross public school district lines or to enroll in private schools. Depending on a particular school's costs and policies, voucher programs may necessitate parents paying some amount of money above the voucher's value to enroll their child in a particular school. ESAs can be like bankable vouchers, where parents can save unspent sums for future years and can often use the money not just for school tuition but for a variety of educational support and enrichment activities.[3]

Voucher programs allow parents a large measure of control and expand opportunity, increasing the number of options available to parents to find a school that will be the best fit for their children. Yet voucher programs are highly controversial because, opponents say, "the money is

[2] National Center on Education Statistics. "Public School Expenditures." April 2018. Available at https://nces.ed.gov/programs/coe/indicator_cmb.asp

[3] For research on how parents use ESAs in practice see Burke, Lindsey. 2013. The Education Debit Card: What Arizona Parents Purchase with Education Savings Accounts. (Friedman Foundation for Educational Choice, now named EdChoice); available at https://www.edchoice.org/wp-content/uploads/2013/08/2013-8-Education-Debit-Card-WEB-NEW.pdf. and Burke, Lindsey, and Jason Bedrick. 2018. Personalizing Education: How Florida Families Use Education Savings Accounts. Ed Choice. Available at: https://www.edchoice.org/wp-content/uploads/2018/02/Personalizing-Education-By-Lindsey-Burke-and-Jason-Bedrick.pdf

being removed from funding public schools." However, total funding isn't the right measure to use when considering whether vouchers are harmful to public education.

How similar ESAs are to vouchers depends on how much public funding is directed into them. In typical public school funding, a school district gets revenue from local taxes, state funding and federal funding, combining all three sources to cover its total expenditures. Money from the state government is usually based on the number of students enrolled and often accounts for other factors such as local income levels. Thus, if a student uses a voucher to attend a school in another school district, that child's old school district loses some of its funding. This is at the heart of most complaints about vouchers. Yet losing funding is not harmful to a school district if its expenditures drop by an equal or greater amount due to having one fewer student to educate; in fact, in most cases such a change leaves the school district in a stronger financial position.

The key is understanding the differences between average total cost, average variable cost and marginal cost.

- Average total cost is the simplest. To find this, simply divide total educational spending (per school or per district) by the total number of students.
- Total costs can be divided into variable and fixed costs.
- Variable costs are those that vary as the number of students changes; in this context, variable costs would include items tied to students such as teacher salaries, transportation costs and supplies.
- Fixed costs are items such as the costs of school buildings (usually fixed bond payments) and central administration.
- Average variable costs are derived by dividing total variable costs by the number of students.
- Marginal costs are based on differences, not averages. The marginal cost tells you how much costs would increase (or decrease) if there was one additional (or fewer) student in the school or district.

If a voucher removes less in funding from a school district's budget than the district would have been spent if that student stayed enrolled, the district actually comes out ahead.

Clearly, the most relevant concept for school choice programs is the marginal cost. If a voucher removes less in funding from a school district's budget than the district would have been spent if that student stayed enrolled, the district actually comes out ahead fiscally, saving more in forgone educational expenses than it loses in funding. Marginal costs are not necessarily constant as the number of students change, but they will be fairly constant in cases of constant or near constant returns to scale. Costs of education display constant returns to scale when costs rise proportionally to the number of students enrolled, something likely to be roughly true for the variable cost of K-12 education.

Because classrooms can be replicated (20 students, one teacher, some supplies and desks), at a practical level education should not be too far away from constant returns to scale. Larger or smaller schools may be slightly more efficient administratively, and costs would vary for different class sizes, but class sizes are unlikely to vary much for a particular grade within a school district and these efficiency effects are likely to be small relative to the amount of total education spending.

This suggests the appropriate approach to determine a level of funding for a voucher or ESA program, in order to prevent any fiscal hardship for school districts which would see shrinking enrollment, is to examine average variable costs, marginal costs and the level of state funding provided. If any public funding redirected is less than average variable costs and the estimated marginal costs, districts should not suffer a financial burden. If only state funding is diverted, there is even less reason to oppose these options.

To that end, this report will estimate the marginal cost of K-12 education for every county school district in Georgia and compare those estimated marginal costs with the average variable cost and state funding received per pupil. It is hoped the numbers presented will help inform the debate on school voucher and ESA programs and disprove charges that these options somehow harm the children whose families choose not to participate.

Some Background on the Fiscal Impacts of Voucher Programs

Understanding that the key to evaluating the fiscal impact of school choice programs on public education is to separate out the fixed, variable and marginal costs of education, it becomes clear that "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."[4] That is, as long as vouchers remove funding only in the amount that *expenditures* will drop due to the removal of the student using the voucher, or an amount less than that, then the local school district will be unharmed by the use of the voucher. Another way to look at this is that while total funding may fall, average spending per student should be expected to rise in almost all cases under a properly designed voucher program.

Based on 2008-09 school year data, the national average spending per pupil for K-12 education was $12,450, with $7,967 being the per-pupil average variable cost, according to a study by Dr. Ben Scafidi, director of the Education Economics Center at Kennesaw State University and a Senior Fellow at the Georgia Public Policy Foundation and EdChoice.[5]

A better measure for the size of a voucher that does no harm to remaining students is the marginal cost, but Scafidi's average variable cost is a good starting point for reasonable voucher values. Vouchers that are smaller than the marginal cost of educating a student not only do no harm to a public school district, but actually leave the district with more money per remaining

[4] Scafidi, Ben. 2012. The Fiscal Effects of School Choice Programs on Public School Districts. (Friedman Foundation for Educational Choice, now named EdChoice), p1.
[5] Ibid.

pupil. Thus, constructed correctly, voucher programs should be popular with those who advocate that public education can be improved by spending more per pupil.

Scafidi's study also found Georgia's average variable costs per student were $7,507 in the 2008-2009 school year, equal to 65.5 percent of total spending per student.[6] While this number needs updating to the present, again, it provides some framing for the numbers to be derived in this report.

Nationally, average annual variable costs per student ranged from just over $5,000 (Utah) to almost $14,000 (New York).[7]

In general, school choice programs have been designed successfully with such fiscal facts in mind (leaving public schools no better or worse off), according to Greg Forster in his report, "A Win-Win Solution: The Empirical Evidence on School Choice."[8] These fiscal analyses generally focused on the state funding part of public schools; federal and local funding are not tied nearly as directly to enrollment numbers.

Empirical studies of 28 different school choice programs found that 25 of those programs save taxpayers money. The remaining three were fiscally neutral.

For state taxpayers to save money, vouchers need to be worth less than state spending for an average student in the impacted local school district, a different criterion than the overall fiscal standard mentioned above – that voucher amounts should be less than the marginal cost of educating the departing student.

Given the range of cost figures found by Scafidi and the spending breakdown laid out by Forster, it is almost certain that voucher programs could be constructed that would be more expensive than state funding per pupil and less than the marginal cost of educating that pupil.[9] In such cases, determining the fiscal impact of a voucher program – both overall and for state and local taxpayers separately – would depend on the precise funding mechanisms of the voucher program.

A clear example of how to construct a voucher program to keep local schools from any fiscal shortfall can be found in Arizona. Arizona provides an ESA to families of children with special needs, children in military families, adopted and foster children, or children in failing schools. These ESAs are similar to a voucher in allowing money to travel with the children, but more flexible in that money can be carried over for future years. Arizona gives an eligible family an

[6] Ibid, p13.
[7] Ibid.
[8] Forster, Greg. 2016. A Win-Win Solution: The Empirical Evidence on School Choice. Fourth Ed. (Friedman Foundation for Educational Choice), p1.
[9] Scafidi, p13 and Forster, p21.

amount equal to 90 percent of the state's per-pupil funding, meaning state taxpayers save money by construction and no local funds are diverted.[10]

While a program such as Arizona's is guaranteed not to impose a financial burden on schools if families choose the ESA, it is far stingier to a family than necessary. State funding averages 45 percent of total K-12 education spending nationwide, so providing vouchers equal only to 90 percent of state funding would fall well below Scafidi's estimate of average variable cost of 65 percent of total spending.[11] To provide maximum benefit to families choosing to exercise their school choice option, it makes sense to estimate the marginal costs at the district level and include not just state but also local monies in the total value of vouchers awarded. With the right estimates of savings to be experienced by public schools due to lower enrollment, such vouchers can be more generous than under Arizona's program while still not leaving local schools worse off financially for their remaining students.

Data

The data for this study come from three sources: Georgia Department of Revenue, Georgia Department of Education, and the U.S. Census.

The Department of Revenue is the source for data on the property tax digest for each school district, the millage rate levied in each district, and the value of one mill. A millage rate is the tax rate on property expressed in dollars per thousand dollars of assessed value. Because Georgia uses a 40 percent assessed value rule, a millage rate of 10 mills would mean $10 in tax owed on $1,000 of assessed value equivalent to $2,500 of market value. The value of one mill represents how much revenue a school district raises from each one mill of property tax and is an excellent way of summarizing how strong the local tax base is. A higher value of one mill means a school district has an easier time raising money locally for school spending. All digests were for 2017 except Fulton County, for which 2016 was used because its 2017 digest has not been accepted by the state yet. Find property tax data at https://apps.dor.ga.gov/digestconsolidation/default.aspx.

The Georgia Department of Education is the source of data on school spending. The school system reports contain information on revenue and spending on a per-pupil (full-time equivalent, or FTE) basis and break down the aggregates by source of funds (federal, state, and local) and by usage (instruction, administration, transportation, support services, etc.). These data allow computation of average spending per pupil, both total and variable as well as the variables needed to estimate marginal costs in Georgia school districts. All the education revenue and spending data can be found at http://www.gadoe.org/Finance-and-Business-Operations/Financial-Review/Pages/School-System-Financial-Information.aspx. This report used the latest data, for the 2016-2017 school year.

[10] Burke, Lindsey. 2013. Expanding Education Choices: From Vouchers and Tax Credits to Savings Accounts. The Heritage Foundation.
[11] Scafidi; Forster.

U.S. Census data provided 2015 median household income for every Georgia county.

Estimating Marginal Costs

To estimate the marginal cost of a student in each county, a statistical model of total costs per pupil was estimated. Then, the estimated model was used to produce the marginal cost by computing the change in total costs as student numbers went up or down by a single student.

The model of total educational costs employed was:

$$TC = \beta_1 + \beta_2 FTE + \beta_3 FTE2 + \beta_4 V1M + \beta_5 STF + \beta_6 ELM + \beta_7 HHI + \beta_8 (FTE*ELM) + \varepsilon.$$

In the above model, TC is the total districtwide spending, FTE is the number of students in the district, FTE2 is the square of the number of students in the district, V1M is the value of one mill of property tax divided by the number of students in the district, STF is index of how much that district received in state funds, ELM is the average number of students per elementary school in that district, HHI is the median household income in that county, and ε represents the variation in total spending per pupil that the model does not explain.

Because the variable being explained is total spending, larger districts will spend more; the inclusion of the number of students and number of students squared picks up this effect. Including how much money can be raised with a one mill property tax on a per student basis, the median household income, and the relative level of state funding allows the model to incorporate whether districts spend more per pupil when it is easier to raise tax revenue or get revenue from the state. Finally, the size of the average elementary school is included to allow for the possibility that either larger or smaller individual schools might be more cost efficient.

To scale the data for better statistical analysis, total cost is divided by 10,000 and FTE is divided by 100. The state funding index (STF) is constructed by taking each county's state funding received per pupil and dividing it by the maximum state funding received by a county, transforming it into an index that runs from 0.27 to 1.00. The model was then estimated by ordinary least squares and the estimated model successfully explained 99.6 percent of the statewide variation in total spending per school district. Results are displayed in Appendix Table 1. T-values shown in the appendix table measure whether we should feel confident in that parameter being estimated precisely enough to tell it is different from zero, with t-values greater in absolute value than 2 denoting such statistical significance.

The model's estimated parameters show that having more students in a school district causes the district to spend more money and that costs increase with students at an increasing rate. A healthier property tax base leads schools to spend more. Larger schools are more expensive when examined alone, but larger school districts save money with larger school sizes (as seen by the negative estimated parameter on the variable FTE*ELM).

The only variables whose estimated parameters are not statistically significant are STF and HHI, implying that higher median household income and more generous state funding do not lead to more spending on schools.

With the estimated model in hand, the marginal costs for each county can be estimated. Abstracting from the data scaling for simplicity, mathematically the marginal cost is given by

$$MC = \beta_2 + \beta_3 FTE + \beta_8 ELM$$

This is simply the derivative of the total cost with respect to the number of students in the district. The estimated parameters and this formula were used to calculate marginal costs for each of the counties. The estimated marginal cost values are presented below in Table 1.

Some people may be surprised at the size of the estimated marginal cost values. After all, shouldn't a district be able to squeeze one more student in a classroom for almost no additional cost at all? The answer is that while at times an additional student will impose a very small cost on a school that has room in a class, at other times that additional student may be the tipping point, triggering the expense of an additional teacher along with the cost of an additional classroom (perhaps even the purchase of a temporary trailer for that purpose). Because both of these situations will occur in the data, as well as experiences in between these two extremes, the marginal costs estimated here are best seen as average marginal costs, where the averaging is over all numbers of possible additional students, from one to the number that requires a new classroom and teacher.

A program that provides vouchers to parents in the amount of either the state funding or average variable cost per student would result in the district having more funding available for the remaining students.

Comparing Average, Marginal and State Funding Costs

Having estimated the marginal costs – the theoretically correct amount for the value of a voucher – it is worth comparing those estimates to the much easier-to-compute measures more likely to be used in an actual, real-world voucher program: average variable cost or state funding per pupil. Table 1, below, shows average total spending per student, the estimated marginal cost of a student, the average variable cost of a student, and the amount of state funding provided per student for all 159 county school districts in Georgia.[12]

[12] Georgia has 181 school districts, including counties and cities, but due to difficulty obtaining data for some variables used in this study for some city districts, the results presented are confined to the county districts.

Average total spending per student is exactly what it sounds like, including all operating cost spending plus debt service payments for capital costs incurred on buildings. Average variable cost is defined as the sum of annual spending on the state-defined categories of instruction, instructional support, media, pupil services, food services, and transportation, again on a per pupil basis. This is a very generous definition, in the sense it is almost surely lower than the true variable cost, as the categories of maintenance and school administration are excluded while likely some (though not all) of the costs in those categories do, in fact, vary with the number of students. State funding is the amount of dollars per student each district received from the state. The final column in Table 1, FTEs, is the number of students in each district.

Importantly, in all but three cases the estimated marginal cost is greater than the average variable cost.[13] The estimated marginal cost exceeds the level of state funding in all 159 counties. . Because the funds removed would be less than the marginal cost, from a fiscal standpoint, the district would be better off losing both the student (and thus the costs of educating the student) and the money for the voucher. Similar principles would guide any redirection of public education funding to ESAs.

The estimated marginal costs themselves are somewhat more problematic. Theoretically, paying a voucher equal to the marginal cost of a student would leave a school district in a financially identical condition, neither better or worse off financially. However, in quite a few cases, the estimated marginal cost is not only above the **average variable cost** but also higher than the **average total cost**. In such cases, a school district would see its total spending per pupil fall after a parent used a voucher. It would be extremely difficult to convince parents of remaining students that their children were not being harmed.

The estimated marginal cost is also higher than the state funding level for all Georgia counties, so vouchers in the amount of the estimated marginal costs would necessarily involve redistribution of local education funds to other schools. This is also likely to be very unpopular. State funding is already being collected from taxpayers all over the state and redistributed to school districts by a complex formula, so using state funds to pay vouchers is simply a redistribution of the current redistribution, making it more politically palatable.

[13] The three exceptions are Baker, Screven and Taliaferro counties. Two of these are tiny school districts; Baker with under 300 students and Taliaferro with fewer than 200. Screven is a little bigger, but still only has three total schools: one elementary, one middle and one high school, with a total of slightly over 2,000 students.

Table 1. Educational Cost Comparison for Georgia Counties

County	Avg Total Cost	Marginal Cost	Avg Variable Cost	State Funding	FTEs
Appling	10,216	10,222	7,571	5,333	3,437
Atkinson	9,469	10,387	6,783	7,182	1,684
Bacon	9,647	9,842	7,142	6,940	2,037
Baker	18,935	11,220	11,790	7,840	278
Baldwin	9,412	8,651	6,000	4,814	5,228
Banks	9,397	9,340	7,187	5,984	2,798
Barrow	8,958	8,625	6,982	5,772	13,399
Bartow	9,340	9,828	6,876	5,362	13,524
Ben Hill	9,487	8,293	6,884	6,477	3,082
Berrien	9,120	8,485	6,468	6,258	3,030
Bibb	9,937	9,621	6,592	4,780	23,134
Bleckley	9,498	9,153	6,424	6,733	2,374
Brantley	9,712	10,574	6,571	7,091	3,312
Brooks	10,327	10,718	6,909	5,508	2,041
Bryan	7,922	8,748	6,031	5,043	8,734
Bulloch	8,978	9,528	6,924	5,225	10,131
Burke	15,366	9,051	8,814	3,092	4,043
Butts	9,418	9,655	6,859	5,367	3,302
Calhoun	12,107	11,274	6,364	6,339	624
Camden	8,446	9,896	6,531	5,321	8,977
Candler	8,847	6,652	6,307	6,254	2,056
Carroll	9,156	9,395	6,706	6,026	14,484
Catoosa	9,964	10,025	7,491	6,442	10,420
Charlton	10,076	10,472	6,756	5,587	1,601
Chatham	10,961	9,254	8,072	4,296	36,580
Chattahoochee	11,486	11,151	6,971	7,822	803

County	Avg Total Cost	Marginal Cost	Avg Variable Cost	State Funding	FTEs
Chattooga	9,595	9,805	7,124	6,243	2,774
Cherokee	8,773	8,518	7,106	4,682	42,275
Clarke	12,205	9,833	8,886	5,062	11,258
Clay	20,191	11,851	9,682	8,852	206
Clayton	8,076	8,712	6,694	5,213	54,532
Clinch	10,746	9,382	6,874	5,775	1,312
Cobb	9,242	8,705	7,239	4,479	115,086
Coffee	9,687	9,944	6,650	6,444	7,424
Colquitt	9,379	9,977	6,785	6,698	9,358
Columbia	8,226	8,937	6,539	4,531	26,741
Cook	8,555	8,426	5,781	5,785	3,103
Coweta	8,983	9,808	6,878	4,621	22,164
Crawford	9,475	8,244	6,529	5,925	1,609
Crisp	10,026	8,950	6,770	6,062	3,919
Dade	9,284	9,810	7,243	5,592	2,047
Dawson	11,072	10,499	8,753	4,740	3,377
Decatur	9,649	10,104	6,309	5,351	5,004
DeKalb	10,375	9,355	7,727	4,690	101,856
Dodge	9,608	8,485	7,147	6,746	3,064
Dooly	10,385	9,195	6,970	5,116	1,248
Dougherty	9,782	9,758	6,516	5,646	14,686
Douglas	9,063	9,616	7,005	5,618	26,537
Early	9,910	7,389	7,188	5,706	2,028
Echols	10,231	9,334	6,949	6,716	802
Effingham	8,832	8,604	7,151	5,782	11,482
Elbert	9,962	10,243	7,103	5,825	2,920
Emanuel	8,739	8,645	6,307	6,137	4,170

County	Avg Total Cost	Marginal Cost	Avg Variable Cost	State Funding	FTEs
Evans	9,238	7,208	6,443	6,026	1,772
Fannin	11,822	10,307	8,836	4,825	2,931
Fayette	9,926	9,513	7,985	4,769	20,089
Floyd	10,626	10,174	7,706	6,404	9,544
Forsyth	8,453	7,022	6,782	4,264	46,326
Franklin	9,719	10,409	7,278	6,009	3,718
Fulton	10,600	9,001	8,378	3,821	95,647
Gilmer	9,973	9,618	7,332	4,748	4,142
Glascock	9,916	9,815	6,764	6,602	563
Glynn	10,085	9,160	7,652	3,959	13,049
Gordon	9,764	9,784	6,790	6,075	6,399
Grady	9,188	9,687	6,347	6,606	4,292
Greene	13,141	9,447	6,617	3,193	2,357
Gwinnett	8,837	7,523	6,595	5,037	182,548
Habersham	9,934	10,404	7,603	6,189	6,874
Hall	8,646	9,317	6,856	4,963	28,008
Hancock	13,455	10,419	8,060	4,843	904
Haralson	10,648	10,387	7,832	7,084	3,288
Harris	9,514	9,677	7,122	4,519	5,103
Hart	9,470	9,559	7,617	4,970	3,429
Heard	9,683	10,841	6,718	5,362	1,928
Henry	8,878	9,228	7,170	5,273	42,146
Houston	9,228	9,344	7,100	5,831	28,212
Irwin	10,197	8,004	7,569	7,027	1,674
Jackson	9,818	9,351	7,147	5,000	7,416
Jasper	9,869	9,473	6,803	5,886	2,300
Jeff Davis	7,638	8,496	6,173	5,566	3,040

County	Avg Total Cost	Marginal Cost	Avg Variable Cost	State Funding	FTEs
Jefferson	9,826	10,427	6,838	6,084	2,531
Jenkins	11,387	9,452	7,846	6,671	1,114
Johnson	10,047	9,852	6,522	6,195	1,104
Jones	9,144	9,245	7,124	6,292	5,146
Lamar	8,791	9,127	6,431	5,012	2,620
Lanier	9,612	10,203	7,259	6,988	1,680
Laurens	9,234	8,355	6,905	6,475	6,162
Lee	8,366	8,553	6,437	5,193	6,194
Liberty	9,394	8,841	7,397	5,923	9,602
Lincoln	10,781	9,814	8,151	5,783	1,138
Long	7,766	7,556	5,932	5,751	3,463
Lowndes	8,667	8,665	6,287	5,379	10,423
Lumpkin	9,286	9,362	6,990	4,793	3,844
Macon	10,944	9,202	6,650	4,864	1,375
Madison	10,285	10,108	7,770	7,133	4,825
Marion	8,803	9,031	6,401	5,459	1,397
McDuffie	9,333	10,028	6,331	5,703	4,003
McIntosh	11,404	9,042	7,136	4,940	1,341
Meriwether	10,429	10,092	7,490	5,161	2,613
Miller	10,604	10,027	5,839	5,544	983
Mitchell	11,017	10,134	5,589	5,352	2,301
Monroe	10,423	9,229	7,810	4,174	3,882
Montgomery	10,164	10,310	7,029	5,835	860
Morgan	11,223	8,872	8,367	5,242	3,072
Murray	8,286	9,011	5,916	5,725	7,346
Muscogee	9,423	10,032	6,705	4,968	30,792
Newton	9,368	9,045	7,153	6,355	19,183

County	Avg Total Cost	Marginal Cost	Avg Variable Cost	State Funding	FTEs
Oconee	9,055	9,618	6,893	4,749	7,576
Oglethorpe	10,368	10,077	7,477	6,183	2,111
Paulding	8,839	8,959	7,150	5,994	29,154
Peach	9,209	9,420	6,283	5,013	3,591
Pickens	10,887	10,013	7,729	4,831	4,348
Pierce	9,107	9,554	6,914	6,287	3,559
Pike	8,533	8,923	6,456	5,830	3,230
Polk	8,982	9,207	6,660	6,198	7,582
Pulaski	9,917	8,928	6,462	6,139	1,288
Putnam	11,431	8,570	8,270	3,831	2,862
Quitman	17,617	11,530	6,859	7,943	317
Rabun	13,123	9,350	9,240	3,279	2,161
Randolph	11,925	10,211	7,042	6,386	872
Richmond	8,954	10,071	6,645	4,928	30,039
Rockdale	9,881	8,946	7,581	5,888	16,265
Schley	9,585	9,511	6,457	7,236	1,250
Screven	9,841	6,241	6,665	5,931	2,260
Seminole	9,770	8,907	6,849	5,607	1,476
Spalding	9,604	10,089	6,855	5,936	9,881
Stephens	9,495	10,029	6,674	5,802	3,940
Stewart	13,929	11,338	8,205	6,921	483
Sumter	9,304	8,907	6,740	5,096	4,491
Talbot	14,085	11,381	8,331	5,286	474
Taliaferro	27,956	11,792	16,359	11,424	147
Tattnall	8,667	9,148	6,450	6,219	3,613
Taylor	10,166	10,627	7,234	6,380	1,405
Telfair	9,271	8,073	6,904	5,740	1,634

County	Avg Total Cost	Marginal Cost	Avg Variable Cost	State Funding	FTEs
Terrell	9,654	9,019	6,791	4,725	1,356
Thomas	9,541	8,384	6,985	5,991	5,549
Tift	9,194	9,688	6,472	5,633	7,603
Toombs	9,777	9,906	6,610	6,281	2,860
Towns	12,327	10,446	8,778	3,626	1,030
Treutlen	9,055	9,511	6,402	6,467	1,085
Troup	9,365	9,705	6,883	5,007	11,951
Turner	10,673	9,329	5,867	6,543	1,274
Twiggs	13,899	10,691	7,118	5,180	815
Union	11,631	9,137	8,356	5,059	2,738
Thomaston-Upson	9,408	7,454	6,343	6,012	4,066
Walker	9,890	10,270	7,662	6,557	8,674
Walton	9,059	8,690	6,823	5,242	13,603
Ware	9,789	9,816	7,102	6,669	5,861
Warren	12,959	10,910	8,302	5,917	586
Washington	9,567	8,576	6,523	4,564	3,060
Wayne	8,710	9,768	6,617	5,539	5,297
Webster	12,806	11,359	8,051	7,413	363
Wheeler	10,452	10,114	6,855	6,789	949
White	10,292	10,312	7,670	5,371	3,820
Whitfield	9,003	10,212	6,983	5,911	13,310
Wilcox	10,090	9,495	6,395	6,275	1,161
Wilkes	11,355	10,579	7,795	5,722	1,480
Wilkinson	12,425	10,825	7,254	5,171	1,402
Worth	9,379	8,159	6,379	5,528	3,197
Averages	$10,241	$9,504	$7,144	$5,717	9,924

Conclusions

The school choice movement has a solid base of support but often runs into opponents who insist vouchers – the reform most desired by advocates – will remove money from public schools and lead to a deterioration of those schools for the remaining students. If vouchers take more money out of a school district than the district saves by not having to educate those students, that criticism would be valid, so it is important that voucher programs are constructed in such a way as to prevent that situation. Similar logic applies to any public funding redirected by an education savings account (ESA) program.

Marginal cost is the economic concept that represents the change in cost from a change in quantity. Applied to vouchers, if the vouchers are worth less than the marginal cost, then students who utilize vouchers will not financially harm public schools; rather, public schools would actually be left in a stronger financial position because even after funding any vouchers or ESAs they would have extra money, thanks to savings realized from having fewer students remaining.

This report shows that for Georgia county school districts the marginal cost of a student can be quite high, even higher than the average total spending per student in some cases. These estimated marginal costs were compared to two other measures: the average variable costs per student and the state funding per student. The average variable cost (representing instructional, media, food and transportation expenditures) was below marginal cost in all but three of the 159 Georgia county districts, and state funding per student was below marginal cost for all county school districts.

This is useful as these two measures are each simple to compute and are collected and publicly posted by the state annually. This report establishes that Georgia could easily implement a voucher program that financially benefits school districts if the values of the vouchers are set to the level of state funding or the average variable cost (with adjustment for a few small districts). This report also demonstrates that an ESA program that includes tax benefits or direct redirection of public funds can easily be designed to ensure that public school districts experience no financial harm. An ESA program funded by redirecting each district's per pupil state funding to ESAs would leave every county school district in Georgia with higher per pupil funding than currently.

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Appendix Table 1. Model Estimates

Variable	Parameter Estimate	T-value
Constant	-2912.6	-2.37
FTE	127.06	45.9
FTE2	0.00752	5.45
V1M	4.3787	4.46
STF	1760.7	1.22
ELM	1.9166	2.77
HHI	0.00087	0.09
FTE*ELM	-0.05343	-11.30

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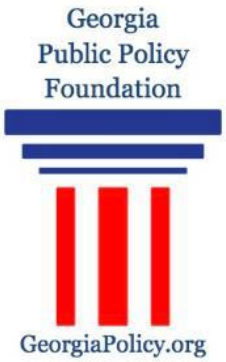
Jeffrey Dorfman is an economist and professor at The University of Georgia and Senior Fellow at the Georgia Public Policy Foundation. He teaches classes in microeconomic theory, the economics of the food industry, and macroeconomic theory and policy.

Dorfman performs research on food insecurity, productivity measurement, economic forecasting and the economics of growth and sprawl. He is a consultant to a variety of businesses, foundations and local governments.

Dorfman is the author of three books – most recently, "Economics and Management of the Food Industry" – and more than 90 academic journal articles as well as articles published in trade publications, the popular press and on the web. He writes regular opinion columns for the Foundation, for RealClearMarkets.com and Forbes, with additional pieces occasionally appearing in other outlets.

He served as editor of the American Journal of Agricultural Economics from 2009-2012 and was elected as a Fellow by the Agricultural and Applied Economics Association in 2013. He earned his B.S. and Ph.D. in agricultural economics at the University of California, Davis.



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