

ON EDUCATIONAL COSTS:

Fixed, Quasi-fixed and Variable Costs



OVERVIEW OF K-12 COSTS

- Fixed costs do not vary with enrollment levels (examples include purchasing, or renting, and maintaining a building; utilities; amortization of debt service; and land purchases)
- Variable costs change with fluctuations in enrollment, both increases and decreases. As enrollment increases, so do variable costs. Likewise, a reduction in enrollment will lower variable costs. A few examples include textbooks and supplies, software licenses, salaries and benefits for school personnel, and supplies for food services
- Quasi-fixed costs are costs that are fixed for a certain number of students but change after reaching a certain enrollment. Teachers provide a basic example
- Enrollment fluctuations are a reality that school districts everywhere have had to manage, even before school choice became part of the education landscape

KEY POINTS

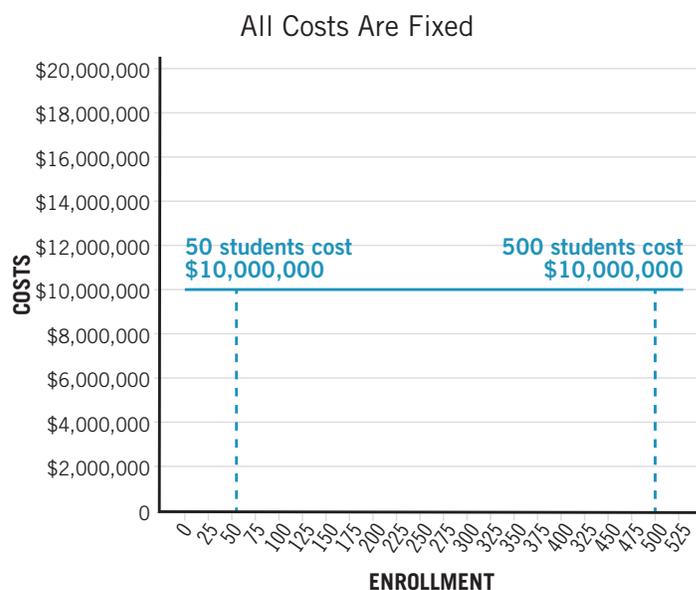
- The fiscal impact of school choice programs on public school districts is determined by how much of school costs are variable.
- In the short run, some costs are fixed and other costs are variable or semi-fixed. In the long run, all costs are variable.

TYPES OF EDUCATIONAL COSTS

When disaggregating the fiscal impact of school choice programs, a key determining component of the impact on public school districts lies in how much of school costs are variable. Having an understanding of these basic economic principles is critical to grasping the potential fiscal impacts of school choice policies. Let's start with a few definitions, defined in the context of education.

Fixed costs: Fixed costs are costs that do not vary with enrollment levels. A few examples include purchasing (or renting) and maintaining a building; utilities; amortization of debt service (e.g. bonding for pensions or capital); and land purchases.

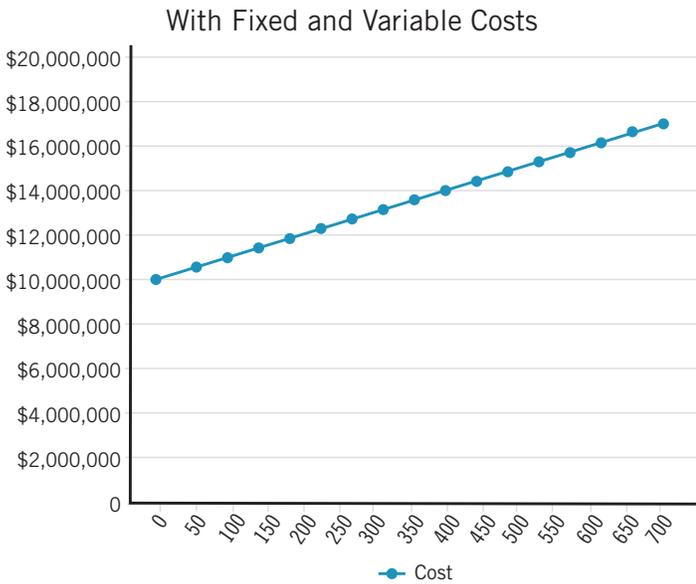
The figure below depicts an example where all costs are fixed and none are variable. To educate the first student, a school must be built, a teacher hired, etc. Let's say this cost is \$10 million. If all costs are fixed, then regardless of enrollment, \$10M must be spent. That is, the cost to educate 50 students or 500 students is the same (\$10M).



Variable costs: Variable costs are costs that change with fluctuations in enrollment. As enrollment increases, so do these costs. Likewise, a reduction in enrollment will lower variable costs. A few examples include textbooks and supplies, software licenses, salaries and benefits for school personnel, and supplies for food services.

The figure below depicts an example where fixed costs equal \$1.3 million and the cost to educate each student is \$10,000. The cost to educate one child is \$10 million (the cost to get the school built, staffed, and running). The additional cost for educating 100

students will be ($\$10,000 \times 100 =$) $\$1M$, and the total cost will be fixed costs plus variable costs, or $\$10M + \$1M = \$11M$ total.



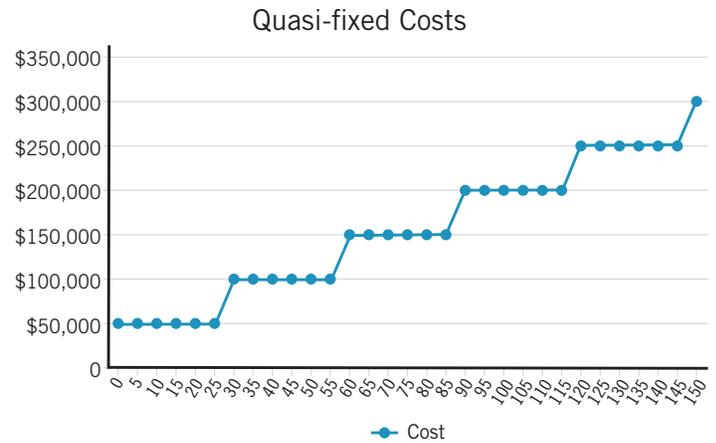
Quasi-fixed (or semi-fixed) costs: Quasi-fixed costs are costs that are fixed for a certain number of students but change after reaching a certain enrollment. Teachers provide a basic example. Educating one child requires fixed costs plus a teacher. An additional student enrolling (assuming she’s in the same grade) can be taught by the same teacher. At some point, however, increasing student enrollment will necessitate hiring an additional teacher.

Transportation provides another example of a quasi-fixed cost. Transporting one student requires purchasing a bus. Transporting two students can be done with the same vehicle. An additional vehicle will be needed at some point with increasing students. Note, however, that transportation represents a quasi-fixed cost in another sense. As enrollment changes, bus routes can also be adjusted in order to economize on vehicles’ wear-and-tear and fuel.

Other quasi-fixed costs might include administrative personnel and services, staff, certain equipment or supplies, or food service.

The figure below illustrates an example of educational costs with respect to teachers, where 30 students can sit in each classroom in a school. Hiring the first teacher costs \$50,000, and she can educate 30 students in a classroom. If an additional student

wishes to enroll, then another teacher will need to be hired. The cost to educate 31 students is now \$100,000, but additional students can enroll without needing to hire an additional teacher. If enrollment reaches 150, six teachers will need to be hired.



WHAT THIS MEANS

Observe that, at some point, some fixed costs become at least partially variable (as the transportation example illustrates). When small numbers of students leave, budgets should be manageable, especially given that school spending across the United States has increased four-fold since the early 1970s (after adjusting for inflation). As more students leave, however, budgets can still be manageable because more costs become variable with larger changes in enrollment. In other words, this implies the following fundamental economic principle:

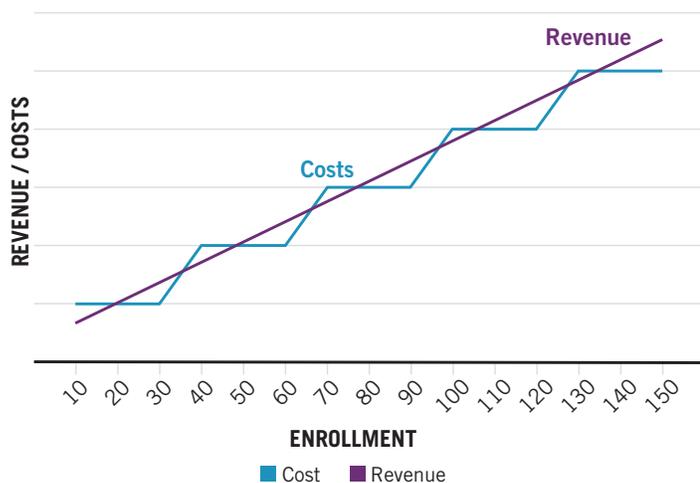
All costs become variable in the long run.

In the immediate short run, all costs are fixed (e.g. the first day a school is built). In the long run, all costs become variable (e.g. after most students leave a school, schools could consolidate and sell an empty building). In between, there is a spectrum where fixed and variable costs mix together. Economist Ben Scafidi (2012) estimated variable costs for K-12 public schools using data from the U.S. Department of Education. Based on these data and a conservative approach to accounting for these costs, he estimated that about 64 percent of all costs are variable, on average.

To be sure, the share of total costs that are variable will vary by state, district, and school. There are

economies of scale at play. In general, smaller schools or districts will usually have higher short-run fixed costs per student than larger schools or districts. Regardless of district size, however, when students leave public schools, it's true that revenue declines, and this can sometimes create a challenge for district financial planners. But, the district is relieved of responsibility for educating these students and subsequently have increased flexibility in their budgets to find commensurate cost savings. This can result in overall net savings, but districts must still make decisions to cut costs.

School Operating Costs and Revenue



Enrollment fluctuations are part of the education landscape as students enter and leave districts freely, and school districts have long been able to manage such changes. Budget fluctuations – such as those that accompany changes in enrollment – presents a challenging economic reality that many actors in our society (e.g. households, grocery stores, small business, governments at all levels, private schools, and universities) must deal with on a regular basis.

OTHER CONSIDERATIONS

If one believes that an educational program such as a school choice program might fiscally harm a school district because of high fixed costs, then there would be little need to fund enrollment growth for that district because all its costs are fixed – it wouldn't matter if enrollment increased (or decreased) by 5 students, 50 students, or 500 students.

If, on the other hand, all of a district's costs are variable, then funding for that district can increase or decrease proportionally with enrollment.

With respect to K-12 education funding, neither of these scenarios is true. Reality is that some costs are fixed and some costs are variable. When one or several students leave a given district, their will likely be a net cost incurred in the very short run. But this is not a new phenomenon, and it is highly unlikely that a few students choosing to leave will inflict an undue fiscal burden. In most cases, they represent perhaps several thousand dollars in a multi-million-dollar budget, and districts have long been accustomed to families entering or leaving its schools for a variety of reasons. As larger numbers of students leave, then the variable costs savings will increase as school districts will face more opportunities to economize. This works the other way as well (i.e. when districts face enrollment increases).

School districts have dealt with economic reality from changing enrollments ever since they have existed; school choice programs may slightly add to the fluctuation of student enrollment, but an overwhelming number of American families are still choosing schools based on ZIP Code.

To be sure, dealing with budget changes is uncomfortable and challenging for anybody, including public officials. The relevant question is whether administrators can and should be expected to handle such challenges without harming students, and whether the benefits associated with expanding educational options for children will exceed the “costs” associated with any challenges administrators might face in managing their budgets.

Martin F. Lueken, Ph.D.,
 Director of Fiscal Policy and Analysis
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