ON EDUCATIONAL COSTS:
Fixed, Quasi-fixed and Variable Costs

edCHOICE

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).

All Costs Are Fixed
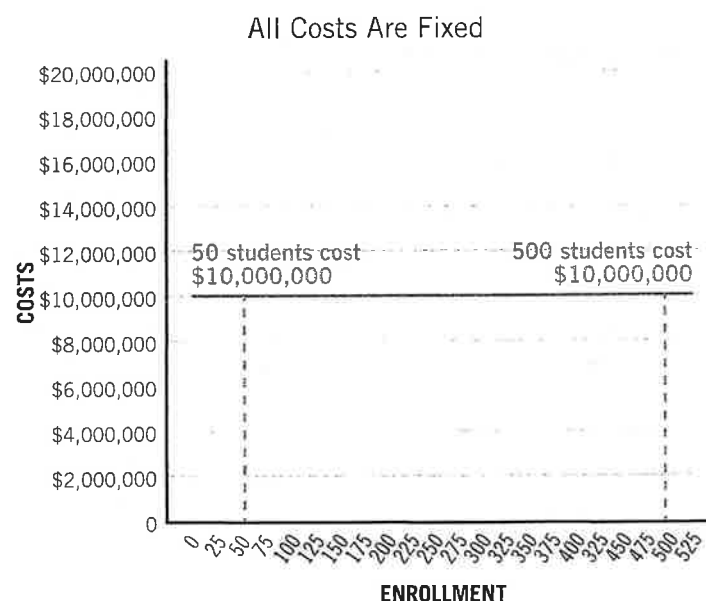
Variable costs: Variable costs are costs that change with fluctuations in enrollment. As enrollment increases, so do these costs. Likewise, a reduction in enrollment will lower variable costs. A few examples include textbooks and supplies, software licenses, salaries and benefits for school personnel, 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 x 100 =) $1M, and the total cost will be fixed costs plus variable costs, or $10M + $1M = $11M total.

With Fixed and Variable Costs
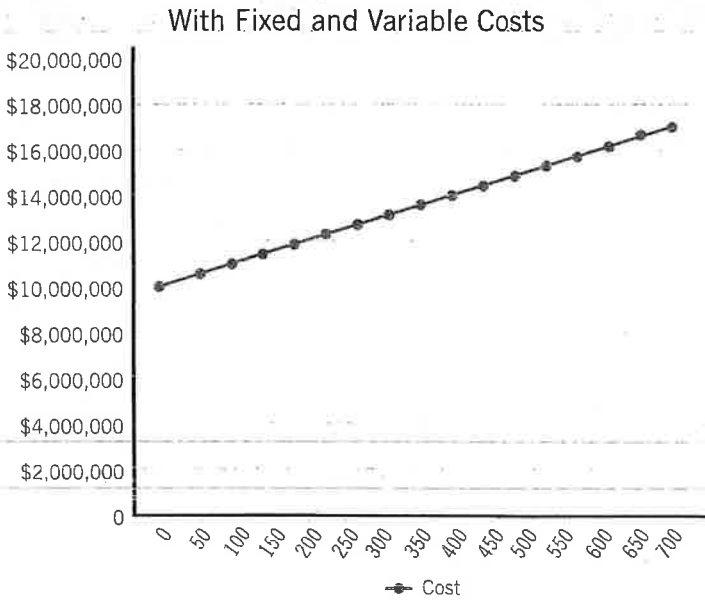
Quasi-fixed (or semi-fixed) costs: Quasi-fixed costs are costs that are fixed for a certain number of students but change after reaching a certain enrollment. Teachers provide a basic example. Educating one child requires fixed costs plus a teacher. An additional student enrolling (assuming she's in 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.

Quasi-fixed Costs
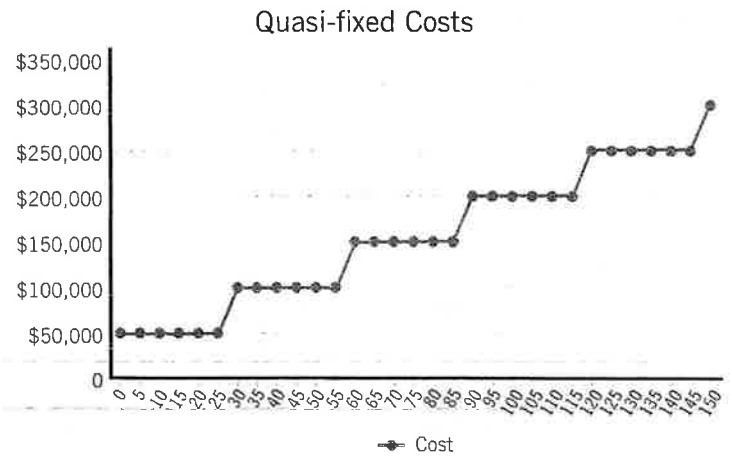
WHAT THIS MEANS

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