Chapter 1: Why Do Economists Study Education Policy?

Problems

1. What does economics bring to the study of education policy?

Economics contributes to the study of education in three main ways: (1) through models about human behavior, (2) through predictions about how incentives affect behavior, and (3) through empirical tools for causal estimation. Models about behavior describe how individuals make decisions about the type, quality, and quantity of their schooling. Economic theory can also help explain the role of markets and government in providing education access. Economic models help describe how education institutions make decisions about what type of education to produce (e.g., math or reading) and the inputs to use in production (e.g., teachers or computers), given prices. Through the predictions generated by these models, economists can describe how changes in policies or incentives affect output decisions. With empirical analysis, including econometric techniques designed to provide causal inference, economists can assess how well models fit behavior and determine the causal effect of different changes in education policies.

2. Discuss some ways education can occur outside of schools. How does the fact that the development of knowledge can occur in and out of schools complicate our ability to determine whether schools are successful at educating students?

Education is the process of developing a new skill or gaining new knowledge. Because the definition of education is general, countless activities, both in and out of the

classroom—contribute to education. Some examples include music lessons to learn how to play the piano, reading news articles to learn about current events, or using a cookbook to make a new type of food. There are so many inputs to education that it extremely difficult to account for all possible confounding factors that lead to educational outcomes. As a result, it can often be difficult to find the effect of individual programs on educational outcomes. For example, is a first grader's improved reading ability due to his teacher's work in the classroom, his parents' assistance at home, or the reading-related television program that he enjoys watching?

3. List three inputs to and three outputs of the production of knowledge. Are all outputs of education easy to measure? How might the fact that some outputs are easy to measure and some are difficult to measure influence the skills on which schools focus?

Three examples of inputs to education are teachers, desks, and blackboards, though there are many more. Two additional inputs of particular importance in education are: (1) a student's own effort, and (2) behavior and interactions with peers or fellow students. Outputs include achievements on tests measured through a test scores, creativity, and problem-solving ability. Some of the outputs of education (such as creativity and problem-solving ability) are extremely difficult to measure or are inherently subjective, while other measures (such as test scores) are easy to measure and fairly standardized. Since many policy makers and administrators are interested in improvements over time, many schools focus on easy-to-measure outcomes that provide a metric for measuring students over time.

4. On any given Saturday night, you have the option of going to a party or studying. Studying for an hour will increase your grade by 0.1% (out of 100). Clearly, partying will not help your

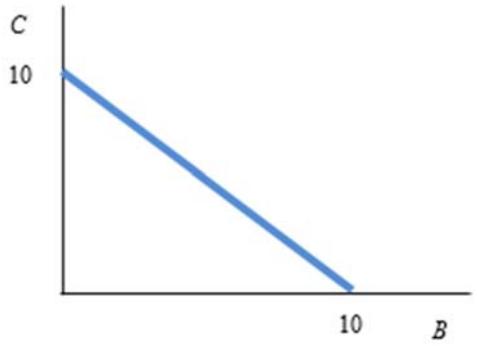
grades. If the average length of a party is four hours, what is the opportunity cost of attending a party in terms of your grade?

The opportunity cost of the party is 0.1% of your grade per hour of the party. In total, attending the party for four hours has an opportunity cost of 0.4% of your grade.

5. An undergraduate has a weekly budget of $20. The only two goods that the student consumes (not covered by the meal plan) are coffee and beer. The price of coffee (at Starbucks) is $2 and the price of a beer is also $2.

    a. On a graph, plot the potential combinations of beer and coffee the student may consume. Be sure to label your axes carefully. Write down the equation for the line describing this budget constraint.

    $2 \times C + 2 \times B = 20$
    $C = 10 - B$



    b. What is the opportunity cost of consuming one more beer?

    The opportunity cost of consuming one more beer is one coffee.

    c. Is it feasible for the student to consume eight beers and four cups of coffee? Explain.

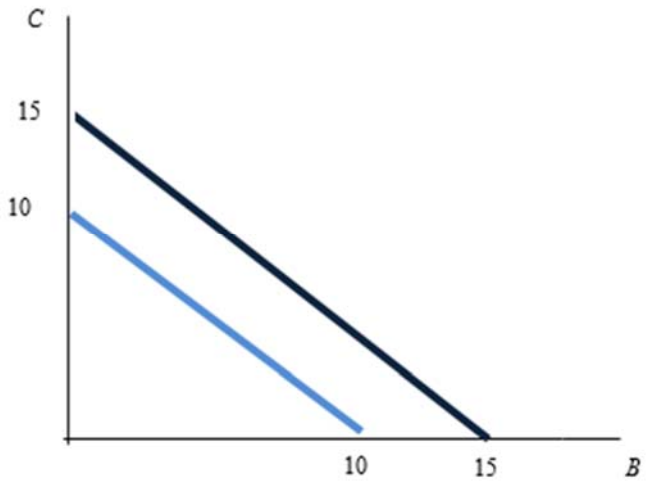
    No. Eight beers and four cups of coffee lie outside the student's budget constraint. In other words, $(2 \times 8) + (2 \times 4) > 20$, which means that the consumption bundle is unaffordable.

d. Explain (and illustrate graphically) the change in the choice set if the student's allowance is increased to $30 per week.

The budget constraint shifts up and to the right. The new budget constraint is $2 \times$

$C + 2 \times B = 30$

$C = 15 - B$

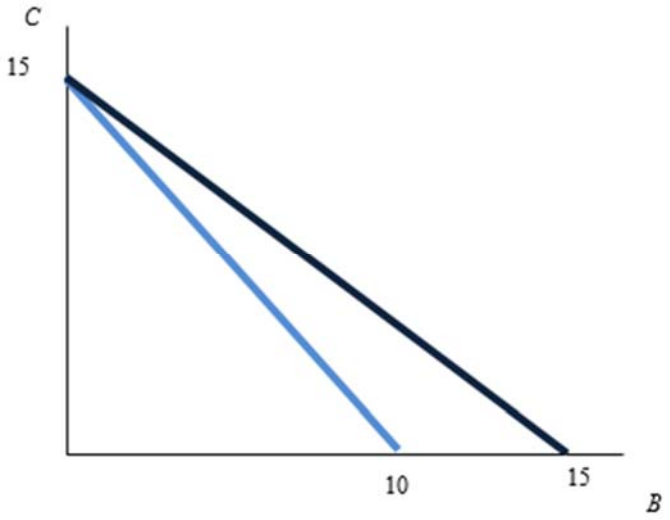


e. Explain (and illustrate graphically) the change in the choice set if the price of beer increases to $3 per mug with the allowance held constant at $30 per week.

The slope of the budget constraint becomes steeper, so some beer and coffee combinations that were affordable before are no longer affordable.

$2 \times C+3 \times B=30$

$C= 15-(3/2) \times B$

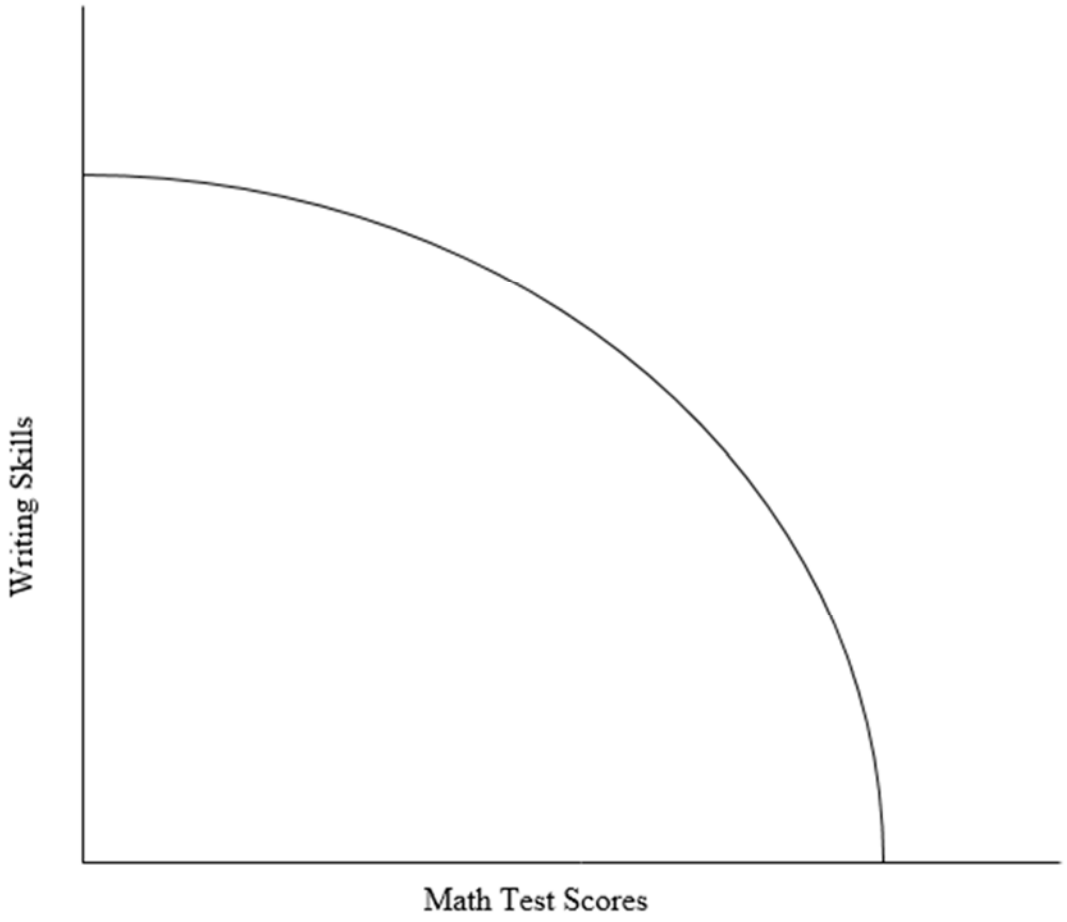


6. The test scores of children in the U.S. are low in comparison with the test scores of children in other countries with similar levels of wealth and development. This cannot be explained by spending, as the United States spends more per child than most other countries. What are two explanations for the lagging achievement of U.S. students?

One explanation is that schools in the United States are not productively efficient: they do not maximize learning outcomes for each dollar spent. Second, U.S. schools may be maximizing outcomes other than those measured on global standardized tests. Third, students enrolled in U.S. schools may include some students who are more disadvantaged than the students in other countries.

7. As the principal of a school, you can produce some combination of two outputs: math test scores and writing skills.

a. Draw a production possibilities curve for these two outputs with math test scores on the *x*-axis. (Hint: The shape should closely resemble the PPF in Figure 1.3



b. Starting from the *y*-intercept, why is the slope of the PPF relatively flat at first?

The PPF is relatively flat because of diminishing marginal returns. At points very close to the *y*-axis, the school is producing many units of writing skills and few units of math scores. Each additional unit of writing skills (moving closer to the *y*-axis) is less productive than the previous unit.

c. Explain why points inside the PPF curve are inefficient.

Points inside the PPF are inefficient because they represent wasted resources. At points inside the curve, more of at least one output can be produced without sacrificing any units of the other output.

d. Show what happens to the PPF if the school receives more resources to spend on both math and writing.

The PPF shifts out at all points. Since the school has more money to spend on both outputs, it can produce more possible output combinations.

e. Show what happens to the PPF if a new math curriculum is developed that makes teachers more effective at math instruction.

With more effective math instruction, more math scores can be produced but writing skills are unaffected. As a result, the *x*-intercept increases and *y*-intercept (representing writing skills) remains unchanged. The PPF rotates outward pivoting on the unchanged *y*-intercept.

8. What are the three broad questions on which economists focus? Give an example of each type of policy question that is different from the examples in the chapter.

The three broad questions of economics are what should be produced, how should it be produced, and for whom should it be produced. “Should music and art education be a component of elementary school curriculum?” is an example of a question asking what education should be produced. “Should charter schools be allowed to open in poor school districts?” is an example of a question asking how education should be produced. “Should economics majors receive a tax subsidy for studying economics?” is an example of a question that asks for whom education should be produced.

9. What is an education market? Who constitutes the demand side of the market? Who constitutes the supply side?

An educational market is the interaction between producers and consumers of education. The demand side of the market includes the students and parents who purchase and use

educational services. The supply side of the market consists of all the producers of education including schools, colleges, and universities.

10. What are the three types of education policies? Give an example of each type of education policy that is different from the examples listed in the chapter.

    The three types of educational policies are total resource policies, input-based policies, and output-based policies. Total resource policies increase the total funding for education that is available. For example, a state raising a school's allocated budget by 5% is an example of a total resource policy since the school has more funding for every type of input. Input-based policies provide funding or target specific educational inputs in an effort to produce a desired outcome. An example of this is a tax subsidy on college textbooks. By lowering the relative price of textbooks, this policy altered the tradeoff between textbooks and other educational inputs. Output-based policies alter incentives to promote certain educational outputs. An example of this type of policy is a statewide scholarship program that offers scholarships to students with grade point averages above a certain cutoff point.

11. Medicaid is a large federal program that provides health insurance to low-income children and families. Although many Medicaid rules are federal, states are responsible for financing most of the program. In 2012, total Medicaid spending by the states was $415 billion. Let's say the federal government passes a law that requires states to cover more children, which will cost more money. Can this policy negatively affect children's educational outcomes? Can it positively affect their educational outcomes? Explain.

    This policy could both negatively and positively affect educational outcomes. If funding for this policy reduced the available education budget, this policy would negatively

affect educational outcomes. With less money for education, the state will likely produce less educational outcomes. On the other hand, if increased Medicaid funding made school-aged children healthier, they might attend more days of school and be more engaged and productive while in school. This increase in attendance could possibly improve the educational outcomes of children affected by the policy increase. In this case, health and educational inputs are complements in production.

12. *Teacher merit pay* describes a set of policies that tie monetary bonuses for teachers to their students' performance on exams. If the Commonwealth of Virginia decides to implement a merit pay system based on standardized math test scores, what do you think will happen to student achievement in English?

    Linking teachers' pay to math scores changes the incentives for spending time on math versus reading (or other subjects) in the school day. As a result, the teacher is likely to spend more time on math to improve test scores. With more time spent on math, there is less time for other subjects, such as English. With less time spent on English, achievement is this subject is likely to decrease. Essentially, this policy could induce the teacher to increase math scores at the cost of English achievement.