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Chapter 1

The Principles and Practice of Economics

Questions

1. Why do we have to pay a price for most of the goods we consume?

Answer: The inputs we use to produce most goods and services (for example, capital and labor) are scarce. Therefore almost all goods and services are scarce compared to the quantity that consumers want to consume. In other words, at a price of zero the demand for most goods is higher than the available supply; our wants are unlimited but our resources are not. Prices act as a rationing mechanism to prevent the over-consumption of such scarce goods, making them available in the quantity such that the supply of these goods matches the demand.

2. Many people believe that the study of economics is focused on money and financial markets. Based on your reading of the chapter, how would you define economics?

Answer: Economics is the study of how agents (for example, households and firms) choose to allocate scarce resources and how these choices affect society. Although it is true that economics studies money and the financial markets, the study of economics is really focused on human behavior and choices. Given that we have limited resources, we need to choose between various options. Economic analysis is used to understand people's choices in order to describe what people do and recommend what people ought to do.

3. Examine the following statements and determine if they are normative or positive in nature. Explain your answer.

- a. Car sales in Europe rose 9.3 percent from 2014 to 2015.
- b. The U.S. government should increase carbon taxes to control emissions that cause global warming.

Answer:

- a. This is an objective statement about the rate of growth in the European automotive industry. Positive economics is analysis that generates objective descriptions or predictions about the world that can be verified with data. Since data can be used here to verify the rate of growth, this is a positive statement.
 - b. The statement that the government *should* increase carbon taxes to control emissions is normative since it states what the government *ought* to do. Normative economics advises individuals and society on their decisions and is almost always dependent on subjective judgments.
4. How does microeconomics differ from macroeconomics? Would the supply of iPhones in the United States be studied under microeconomics or macroeconomics? What about the growth rate of total economic output in the national economy?

Answer: Microeconomics is the study of how individuals, households, firms, and governments make choices, and how those choices affect prices, the allocation of resources, and the well-being of other

agents. Macroeconomics is the study of the economy as a whole. Macroeconomists study factors that affect overall – in other words, aggregate – economic performance.

The supply of iPhones refers to the supply of a good by an individual firm, Apple. The iPhone market will be studied under microeconomics. Microeconomics studies how individuals, households, firms and governments make choices, and how those choices affect prices and the allocation of resources. The growth rate of total economic output, on the other hand, refers to the aggregate American economy, and is therefore studied under macroeconomics.

5. What does a budget constraint represent? How do budget constraints explain the trade-offs that consumers face?

Answer: A budget constraint is an equation representing the goods or activities that a consumer can choose given her limited budget. Tradeoffs arise when some benefits must be given up in order to gain others. In other words, a trade-off occurs when you give one thing up to get something else. Since a budget constraint shows the set of things that you can choose to do or buy with a fixed amount of money, it also shows that if you choose to buy more of one good, you will have to buy less of another. Therefore, a budget constraint equation implies that a consumer faces a tradeoff.

6. This chapter introduces the idea of opportunity cost.
- What is meant by opportunity cost?
 - What is the opportunity cost of taking a year after graduating from high school and backpacking across Europe? Are people who do so being irrational?

Answer:

- Opportunity cost is the best alternative use of a resource. The opportunity cost of a particular choice is measured in terms of the benefit foregone from the next best alternative. To facilitate comparison, the benefits and costs of various choices are translated into monetary units like dollars.
 - The opportunity cost of backpacking across Europe, for a particular person, is the cost of anything else that could have been done in that year. The backpacker could have attended college or started working. These costs are the opportunity costs of the gap year. This, however, does not mean that backpackers are irrational, because the benefits may exceed the cost. Every action has an opportunity cost. The choices that people make are optimal based on their perceived costs and benefits.
7. The costs of many environmental regulations can be calculated in dollars—for instance, the cost of “scrubbers” that reduce the amount of air pollution emitted by a coal factory. The benefits of environmental regulations often are most directly expressed in terms of lives saved (reduced mortality) or decreases in the incidence of a particular disease (reduced morbidity). What does this imply about the cost-benefit analysis of environmental regulations? There is an old saying “You can’t put a price on a human life.” Do you agree or disagree? Explain.

Answer: Cost-benefit analysis can be used when there is a common unit, such as dollars. This method is less straightforward if there are two different units of measurement, such as dollars and lives. However, if a direct link can be drawn between dollars spent and lives saved then cost-benefit analysis becomes feasible. When an environmental regulator places a value of 3 million dollars on a human life (for example), they are claiming that if 3 million dollars is not spent in one area, then it can instead be spent in another area where 3 million dollars is expected to save one life, on average. While some people may find this practice controversial, it does provide the most practical way to maximize the number of lives saved, given limited financial resources.

8. Suppose the market price of corn is \$5.50 per bushel. What are the three conditions that will need to be satisfied for the corn market to be in equilibrium at this price?

Answer: For the market to be in equilibrium, three conditions will need to be satisfied.

- At the price of \$5.50 per bushel, the amount of corn produced by sellers should be equal to the amount of corn purchased by buyers in the market.
 - Farmers have chosen the optimal quantity of corn to produce given the price of \$5.50 per bushel.
 - Consumers have chosen the optimal quantity of corn to buy given the price of \$5.50 per bushel.
9. Economists are often concerned with the free-rider problem.
- a. What is meant by free riding? Explain with an example.
 - b. Are public parks subject to the free-rider problem? What about keeping city streets clean? Explain your answer.

Answer:

- a. A free rider is a person who receives the benefit of a good but avoids paying for it. People tend to pursue their own private interests and usually don't contribute voluntarily to the public interest. For example, watching a pirated copy of a movie is cheaper than buying one. Those who watch the pirated version are free riders because there are others who buy the movie or pay for movie tickets. If everyone watched pirated copies, making movies would not be profitable and the industry would not function.
 - b. Cleaning of city streets may be subject to free riding. Suppose the streets are cleaned every day at a fixed cost. This cost is borne by those who pay taxes to the city government. However, they cannot prevent others who do not pay taxes from using the clean streets. This leads to the free rider problem. However, not all free riding is necessarily problematic. For a park that already exists, it is good when many people enjoy its benefits, especially when there are no real costs associated with usage. The park example demonstrates that free riding is not a problem *per se*. Rather, it may lead to the underproduction of public goods -- but once a particular public good exists people should use it as much as possible, so long as they do not get in other people's way.
10. Explain the concept of causation with the help of a simple real-life example.

Answer: Causation is a relationship between two events or states, such that one brings about a change in the other. In short, it explains the cause and effect relationship between two variables or events. For example, people who go to college learn skills that are valuable to prospective employers. So a college degree causes someone's wages to rise.

11. Identify the cause and the effect in the following examples:

- a. A rise in the worldwide price of peaches and a drought in California.
- b. A surge in cocoa prices and a pest attack on the cocoa crop that year.

Answer:

- a. A drought in California causes a decrease in supply of peaches, and thus a rise in price.
- b. The pest attack is likely to have reduced the cocoa crop, leading to a rise in prices.

Problems

1. You have already purchased (non-refundable and unsellable) tickets to a concert on Friday night. A friend also invites you to her birthday party on Friday. While you like your friend, you politely decline because you really want to go to the concert.
 - a. You learn that your friend is serving flank steak at her party, all-you-can eat and at no charge. Flank steak is your favorite food. Should this affect your decision to go to the concert? Explain by using the term “opportunity cost.”
 - b. Suppose instead that you notice that the non-refundable concert ticket (that you already purchased) cost you \$10; previously you had mistakenly believed the price was \$100. Should learning this information affect your decision to go to the concert?

Answer:

- a. This should affect your decision, or at least make you reconsider. The explicit cost of the concert has not changed, nor the benefit of the concert itself. However, the opportunity cost of missing the party is now higher than you previously thought.
 - b. This should *not* affect your decision. Whether you paid (\$10 or \$100) in the past is irrelevant to the costs and benefits that you can affect by going (or not going) to the concert.
2. You are thinking about buying a house. You find one you like that costs \$200,000. You learn that your bank will give you a mortgage for \$160,000 and that you would have to use all of your savings to make the down payment of \$40,000. You calculate that the mortgage payments, property taxes, insurance, maintenance, and utilities would total \$950 per month. Is \$950 the cost of owning the house? What important factor(s) have you left out of your calculation of the cost of ownership?

Answer: You have ignored the opportunity cost of the funds you are using for the down payment. By using your \$40,000 to buy the house, you give up the opportunity to earn interest on that money. If you could earn 5% interest, then the opportunity cost is $0.05 \times \$40,000 = \$2,000$ per year, or \$167 per month. This does not imply that you should not buy this house. It does imply, however, that you need to think carefully about opportunity cost as you weigh this decision. An economist would tell you that the monthly cost of owning this home is $\$950 + \$167 = \$1,017$.

3. You have 40,000 frequent flier miles. You could exchange your miles for a round trip ticket to Bermuda over spring break. Does that mean your flight to Bermuda would be free? Explain your reasoning.

Answer: It does not. You could use your miles for other travel and so there is an opportunity cost if you use your miles to fly to Bermuda. Suppose, for example, you are definitely going to fly to Chicago when the spring semester is over. You could use your 40,000 miles to fly to Chicago or you could purchase a ticket for \$300. In this case, the opportunity cost of using your miles to fly to Bermuda is the \$300 you will have to spend for the airfare to Chicago.

4. You have decided that you are going to consume 600 calories of beer and snacks at a party Saturday night. A beer has 150 calories and a snack has 75 calories.
 - a. Create a table that shows the various combinations of beer and snacks you can consume. To keep things simple, use only round numbers (e.g., you could choose 1 or 2 beers but not 1.5 beers).
 - b. What is the opportunity cost of a beer?

Answer:

- a. Suppose you choose to consume 0 beers. Then you could use all 600 calories on snacks. Since snacks have 75 calories you could consume $600 / 75 = 8$ snacks. Now suppose you choose 1 beer. A beer has 150 calories and so you would be left with $600 - 150 = 450$ calories for snacks. You could therefore consume $450 / 75 = 6$ snacks if you choose 1 beer. You can use the same logic to complete the table below.

Beer	Snacks
0	8
1	6
2	4
3	2
4	0

- b. If you consume 1 more beer you will have 150 fewer calories for snacks. Since a snack has 75 calories, consuming one more beer means that you will have to give up $150 / 75 = 2$ snacks. The opportunity cost of a beer is therefore 2 snacks.
5. Suppose you are ready to check out and see two lines: Line A has 3 people, while line B has 5 people.
- a. Assume people just chose lines at random and have not yet had a chance to switch lines. Would you consider this situation to be in equilibrium? Why or why not?
- b. Assume that all 8 shoppers are optimizing (i.e., they have had a chance to switch), and that the situation is in equilibrium. What conclusions would you draw?
- c. Of all 8 shoppers, whose behavior is the most informative?

Answer:

- a. This situation is not in equilibrium. Assuming both lines move at the same speed, it would make sense for the last person in the longer line to switch to the shorter line.
- b. If the 8 shoppers know what they are doing, then it must be the case that the shorter line moves more slowly.
- c. The behavior of the last person in each line is the most informative. The assumption that these shoppers are optimizing allows an outside observer to draw conclusions about the speed of the two lines.
6. Consider the following three statements:
- You can either stand during a college football game or you can sit. You believe that you will see the game very well if you stand and others sit but that you will not be able to see at all if you sit and others stand. You therefore decide to stand.
 - Your friend tells you that he expects many people to stand at football games.
 - An economist studies photos of many college football games and estimates that 75 percent of all fans stand and 25 percent sit.

Which of these statements deals with optimization, which deals with equilibrium, and which deals with empiricism? Explain.

Answer: The first statement involves optimization. You believe that you will be best off if you stand regardless of the decisions other people make. The second statement involves equilibrium. If many other people also reason as you did then we should expect many people will decide to stand. The third statement involves empiricism. Our theory tells us that we should expect many people to stand at games. This economist's empirical study supports the theory.

7. In 2014, California was in its third year of a major drought. With water supplies dwindling, Governor Brown issued a plea for a voluntary 20 percent reduction in water use. This target was not reached. In early 2015 Governor Brown issued an executive order requiring local water agencies to reduce water use by 25 percent, but no enforcement mechanism was specified. No taxes or fines were in the executive order. State officials hoped that they could achieve compliance without resorting to fines.
 - a. From an individual homeowner's perspective, what are the costs and benefits of using water during a drought? Why do you think that the voluntary reduction order in 2014 didn't work?
 - b. Using concepts from this chapter, explain how you might get individual homeowners to reduce water use during a drought.
 - c. Eventually, many communities began levying fines on water use. However, while many middle income families dramatically cut water use, wealthy households cut back their water use relatively little. How can you explain this phenomenon from an economic perspective?

Answers:

- a. With no specific enforcement mechanism, there is low cost to using water. Water bills are not zero, but these prices were low enough in the past to create a water shortage, so clearly the financial cost is not high enough to prevent a shortage. There may be some social stigma attached to watering a lawn, though this cost varies for each person and depends on their sense of civic responsibility. On the flip side, the benefits of using water are quite clear: Green lawns, pleasant showers, and odorless toilets. The fact that the 2014 plea did not work is because the cost of violating a call for civic responsibility is not very high for most people.
 - b. Charging a higher price for water than in 2014 would likely result in a reduction in water usage. When the price goes up, people would discover that some of their usage is actually not that important.
 - c. Fines are equivalent to a higher price for water. In this case, lower income individuals were more price elastic; they responded more sharply to a price change. This implies that the willingness to pay for the last gallon of water in a low-income household is less than the willingness to pay in a high-income household.
8. An economist observes that many students spend \$100,000 to go to college. This researcher could ask whether such spending is worth it, or she could assume that it is worth it. In other words, she could assume that students are optimizing and that the education system is in equilibrium. What can the economist conclude about the value of a college education?

Answer: An economist will conclude that college increases earnings (over a lifetime) by *at least* \$100,000 -- the increase may be higher, but it cannot be lower. If this were not the case then students would choose to skip college. This analysis assumes there are no other benefits to college besides higher income; as well as no other costs besides monetary costs. In reality there are many other costs and benefits of college. However, the main point stands: The observation that people are willing to pay a certain amount for college provides information about the economic value of college.

9. It is the night before your economics final exam and you must decide how many hours to study. The total benefits column shows how many more points you expect to earn because of increased knowledge. The cost column shows how many points you will lose because of careless errors due to

lack of sleep. (The “marginal” columns show the effect of each additional hour spent studying. These marginal numbers are calculated by taking the difference within a column from one row to the next row.)

Hours Spent Studying	Total Benefit	Marginal Benefit	Total Cost	Marginal Cost
0	0	--	0	--
1	10	10	0	0
2	16	6	3	3
3	20	4	8	5
4	20	0	15	7

- If you study in an optimal way, how many more points will you earn on the test?
- Explain how you can find the optimal number of hours by using the marginal benefits and marginal costs columns.

Answer:

- Total benefit minus total cost is maximized at $16 - 3 = \underline{13}$ when you study for two hours. This difference is lower in all other rows.
- You can arrive at the answer of 2 hours by noticing that the first hour is well worth it since the marginal benefit of 10 is greater than the marginal cost of 0. The second hour is also worth it since $6 > 3$. However, the third hour is not worth it since $4 < 5$, thus you will gain fewer points than you will lose. (This sort of “marginal analysis” is a recurrent theme in economics.)