Solutions for Microeconomics 22nd Edition by McConnell

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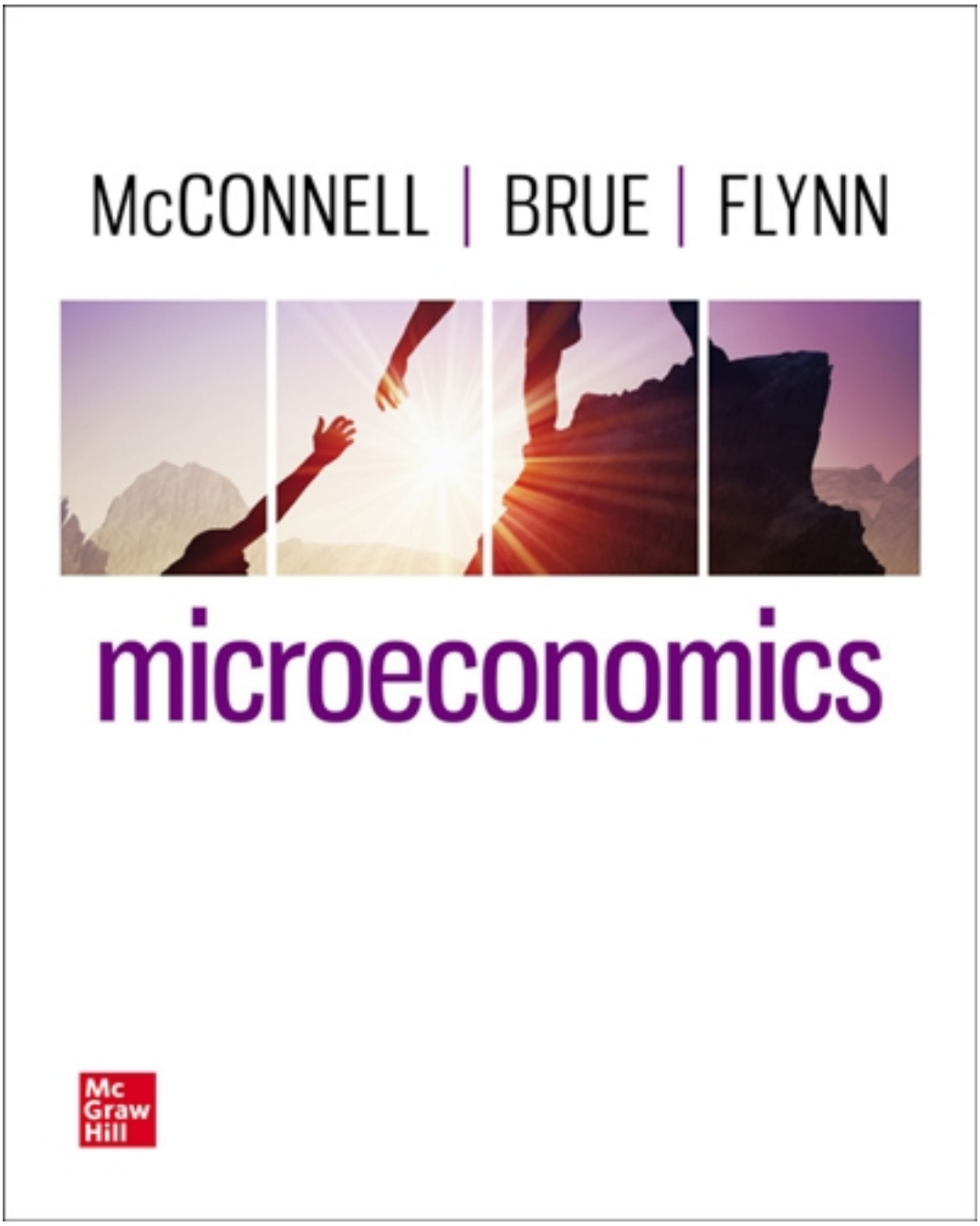


Solutions

Chapter 01 - Limits, Alternatives, and Choices

McConnell Brue Flynn 22e

DISCUSSION QUESTIONS

1. What is an opportunity cost? How does the idea relate to the definition of economics? Which of the following decisions would entail the greater opportunity cost: Allocating a square block in the heart of New York City for a surface parking lot or allocating a square block at the edge of a typical suburb for such a lot? Explain. **LO1**

   Answer: An opportunity cost is what was sacrificed to do or acquire something else. The condition of scarcity creates opportunity cost. If there was no scarcity, there would be no need to sacrifice one thing to acquire another. The opportunity cost would be much higher in New York City as the alternative uses for that square block are much more valuable than for a typical suburban city block.

2. Cite three examples of recent decisions that you made in which you, at least implicitly, weighed marginal cost and marginal benefit. **LO1**

   Answer: Answers will vary, but may include the decision to come to class, to skip breakfast to get a few extra minutes of sleep, to attend college, or to make a purchase. Marginal benefits of attending class may include the acquisition of knowledge, participation in discussion, and better preparation for an upcoming examination. Marginal costs may include lost opportunities for sleep, meals, or studying for other classes. In evaluating the discussion of marginal benefits and marginal costs, be careful to watch for sunk costs offered as a rationale for marginal decisions.

3. What is “utility” and how does the idea relate to purposeful behavior? **LO1**

   Answer: “Utility” refers to the pleasure, happiness, or satisfaction gained from engaging in an activity (eating a meal, attending a ball game, etc.). It is an important component of purposeful behavior because people will allocate their scarce time, energy, and money in an attempt to gain the most utility possible.

4. What are the key elements of the scientific method, and how does this method relate to economic principles and laws? **LO2**

   Answer: The key elements include the gathering of data (observation), the formulation of possible explanations (hypothesis), testing the hypothesis, determining the validity of the hypothesis, and repeated testing of hypotheses that have appeared to be valid in prior tests.

The scientific method is the technique used by economists to determine economic laws or principles. These laws or principles are formulated to explain and/or predict behavior of individuals or institutions.

5. Make (a) a positive economic statement of your choice, and then (b) a normative economic statement relating to your first statement. **LO3**

   Answer: Answers will vary. Example: (a) The unemployment rate is 4.8 percent; (b) the unemployment rate is too high. In general, we treat "what is" statements as positive, "what should be" as normative, but keep an eye out for statements like "at full employment an increase in the production of pizzas *should* come at the cost of less robots." Some students may incorrectly identify the statement as normative because of the term "should."

6. How does the slope of a budget line illustrate opportunity cost and trade-offs? How does a budget line illustrate scarcity and the effect of limited incomes? **LO4**

   Answer: Budget lines are always sloped downward. This downward slope shows an inverse relationship between the two goods, meaning that as you increase one, the other must decrease. This decrease is what you are giving up, or opportunity cost, of the good you are getting more of.

   Budget lines illustrate scarcity in that they show you are limited by your income. Since they slope downward, they show you cannot keep getting more and more of both goods. There is always a trade-off. The area beyond the budget line represents combinations of the goods that are beyond your income.

7. What are economic resources? What categories do economists use to classify them? Why are resources also called factors of production? Why are they called inputs? **LO5**

   Answer: Economic resources are the natural, human, and manufactured inputs used to produce goods and services.

   Economic resources fall into four main categories: labor, land (natural resources), real capital (machines, factories, buildings, etc.,) and entrepreneurs.

   Economic resources are also called *factors of production* because they are used to *produce* goods and services. They are called *inputs* because they go *in* to a production process (like ingredients go into a bowl to make a cake), with the resulting goods and services also being referred to as *output*.

8. Why is money not considered to be a capital resource in economics? Why is entrepreneurial ability considered a category of economic resource, distinct from labor? What roles do entrepreneurs play in the economy? **LO5**

   Answer: Money is not considered a capital resource because money is not productive – it provides access to resources but itself does not directly contribute to the production of goods and services. Additionally, the quantity of money in circulation does not determine an economy's productive capacity, while the amount of capital and other resources does. Doubling the amount of money in circulation does not change the economy's physical capacity to produce goods and services. Money is, however, referred as a *financial resource* and *financial capital*, reflecting its ability to acquire real economic resources.

   Entrepreneurial ability and labor are both human resources, but they perform different functions in the productive process. Entrepreneurial ability does not directly produce goods and services; it organizes the resources that do. Labor refers to the human inputs that directly engage in production.

   Entrepreneurs are risk-takers: They coordinate the activities of the other three inputs for profit—or loss, which is why they are called risk-takers. Entrepreneurs sometimes manage companies that they own, but a manager who is not an owner is not necessarily an entrepreneur but may be performing some of the entrepreneurial functions for the company. Entrepreneurs are also innovators, or perhaps inventors, and profits help to motivate such activities.

9. Explain the typical shapes of marginal-benefit and marginal-cost curves. How are these curves used to determine the optimal allocation of resources to a particular product? If current output is such that marginal cost exceeds marginal benefit, should more or fewer resources be allocated to this product? Explain. **LO6**

   Answer: The marginal benefit curve is downward sloping, MB falls as more of a product is consumed because additional units of a good yield less satisfaction than previous units. The marginal cost curve is upward sloping, MC increases as more of a product is produced since additional units require the use of increasingly unsuitable resource. The optimal amount of a particular product occurs where MB equals MC. If MC exceeds MB, fewer resources should be allocated to this use, as the additional cost is more than the additional benefit. The resources are more valuable in some alternative use (as reflected in the higher MC) than in this use (as reflected in the lower MB).

10. Suppose that, on the basis of a nation's production possibilities curve, an economy must sacrifice 10,000 pizzas domestically to get the 1 additional industrial robot it desires but it can get the robot from another country in exchange for 9,000 pizzas. Relate this information to the following statement: "Through international specialization and trade, a nation can reduce its opportunity cost of obtaining goods and thus 'move outside its production possibilities curve." **LO7**

    Answer: The message of the production possibilities curve is that an individual nation is limited to the combinations of output indicated by its production possibilities curve. International specialization means directing domestic resources to output which a nation is highly efficient at producing. International trade involves the exchange of these goods for goods produced abroad. Specialization and trade have the same effect as having more and better resources or discovering improved production techniques. The output gains from greater international specialization and trade are the equivalent of economic growth.

11. **LAST WORD** Starbucks has $1 billion to invest. It can either purchase a rival coffee shop chain or build additional Starbucks shops. If Starbucks chooses to purchase the rival chain, what does that say about the relative profitability of purchasing and owning the rival's existing shops versus building additional Starbucks shops? Explain.

    Answer: If Starbucks made the decision to invest the $1 billion by purchasing a rival chain rather than building additional Starbucks shops, we can assume that Starbucks' management had made a careful comparison of the marginal costs and marginal benefits of each option and found that the net marginal benefit (or profitability) of purchasing the rival chain to be higher. Of course, the management team also determined that expected marginal benefits exceeded marginal costs. Otherwise, it would not make sense to pursue either option because they would be unprofitable.

REVIEW QUESTIONS

1. Match each term with the correct definition. **LO1**

    economics
    opportunity cost
    marginal analysis
    utility

    a. The next-best thing that must be foregone in order to product one more unit of a given product.
    b. The pleasure, happiness, or satisfaction obtained from consuming a good or service.
    c. The social science concerned with how individuals, institutions, and society make optimal (best) choices under conditions of scarcity.

d. Making choices based on comparing marginal benefits with marginal costs.

Answer: a. Opportunity cost; b. Utility; c. Economics; d. Marginal analysis

2. Indicate whether each of the following statements applies to microeconomics or macroeconomics: **LO3**
   a. The unemployment rate in the United States was 3.7 percent in December 2018.
   b. A U.S. software firm laid off 15 workers last month and transferred the work to India.
   c. An unexpected freeze in central Florida reduced the citrus crop and caused the price of oranges to rise.
   d. U.S. output, adjusted for inflation, increased by 2.3 percent in 2017.
   e. Last week Wells Fargo Bank lowered its interest rate on business loans by one-half of 1 percentage point.
   f. The consumer price index rose by 2.2 percent from November 2017 to November 2018.

   Answer: a. Macroeconomics; b. Microeconomics; c. Microeconomics; d. Macroeconomics; e. Microeconomics; f. Macroeconomics

3. Suppose that you initially have $100 to spend on books or movie tickets. The books start off costing $25 each and the movie tickets start off costing $10 each. For each of the following situations, would the attainable set of combinations that you can afford increase or decrease? **LO4**
   a. Your budget increases from $100 to $150 while the prices stay the same.
   b. Your budget remains $100, and the price of books remains $25, but the price of movie tickets rises to $20.
   c. Your budget remains $100, and the price of movie tickets remains $10, but the price of a book falls to $15.

   Answer:
   a. **Increase** because a larger budget allows you to purchase not only the combinations that you could afford before but also new combinations that you could not afford before (for example, you can now afford to purchase 4 books and 5 movie tickets);

   b. **Decrease** because certain combinations are no longer affordable (for example, you can no longer purchase 10 movie tickets with your $100 budget);

   c. **Increase** because the lower price allows you to purchase combinations that you could not afford before (for example, you can now purchase 6 books and 1 movie ticket)].

4. Suppose that you are given a $100 budget at work that can be spent only on two items: staplers and pens. If staplers cost $10 each and pens cost $2.50 each, then the opportunity cost of purchasing one stapler is: **LO4**
   a. 10 pens.
   b. 5 pens.
   c. zero pens.
   d. 4 pens.

   Answer: 4 pens. You must forego purchasing 4 pens if you are to free up enough money (4 × $2.50 = $10) to purchase a stapler.

5. For each of the following situations involving marginal cost (MC) and marginal benefit (MB), indicate whether it would be best to produce more, fewer, or the current number of units. **LO4**
   a. 3,000 units at which MC = $10 and MB = $13.
   b. 11 units at which MC = $4 and MB = $3.
   c. 43,277 units at which MC = $99 and MB = $99.
   d. 82 units at which MC < MB.
   e. 5 units at which MB < MC.

   Answer:
   a. **More** because MB > MC -- the benefit of consuming one more unit exceed the opportunity costs (scarce resources used elsewhere) of producing that additional unit.

   b. **Fewer** because MC > MB -- the opportunity costs (scarce resources used elsewhere) of producing one more unit exceed the benefit of consuming that additional unit.

   c. **Current amount** because MB = MC -- there is no net gain in using scarce resources in producing and consuming one more unit.

   d. **More** because MB > MC -- *see the explanation for part* (**a**)

   e. **Fewer** because MB < MC -- *see the explanation for part* (**b**)

6. Explain how (if at all) each of the following events affects the location of a country's production possibilities curve. **LO6**
   a. The quality of education increases.
   b. The number of unemployed workers increases.
   c. A new technique improves the efficiency of extracting copper from ore.
   d. A devastating earthquake destroys numerous production facilities.

Answer:

a. Assuming better education translates into better work skills, then productivity should increase, and this would shift the curve outward.

b. Should not affect location of curve. Production moves inward, away from the curve.

c. The curve should shift outward as more production is possible with existing resources

d. The curve should shift inward with the destruction of resources (capital).

7. What are the two major ways in which an economy can grow and push out its production possibilities curve? **LO7**
   a. Better weather and nicer cars.
   b. Higher taxes and lower spending.
   c. Increases in resource supplies and advances in technology.
   d. Decreases in scarcity and advances in auditing.

   Answer: The economy produces output from resource inputs like land, labor, and capital. So one major way for an economy to grow and push out its production possibilities curve is for it to *obtain more resources*. The second major way is to *develop new and better technologies* so that the economy can produce more from any given amount of resources.

PROBLEMS

1. Potatoes cost Janice $1 per pound, and she has $5.00 that she could possibly spend on potatoes or other items. If she feels that the first pound of potatoes is worth $1.50, the second pound is worth $1.14, the third pound is worth $1.05, and all subsequent pounds are worth $0.30 per pound, how many pounds of potatoes will she purchase? How many pounds will she purchase if she has only $2 to spend? **LO1**

   Answer: 3; 2

   Feedback: Janice will purchase potatoes until the value of potatoes is less than the cost of potatoes or until her income has been exhausted. For example, assume Janice has $5.00 to spend on potatoes or other items and the cost of a pound of potatoes is $1. Now assume the first pound of potatoes is worth $1.50 to Janice. She will purchase this pound of potatoes since the value of the pound of potatoes ($1.50) is greater than the cost ($1). If the second pound is worth $1.14 and the third pound is worth a $1.05 then Janice will purchase these as well since the value exceeds the cost of $1. If all remaining pounds are worth $0.30 then Janice

will not purchase these because the value is less than the cost. So, Janice will purchase 3 pounds of potatoes at total cost of $3.00.

Now assume Janice only has $2.00 to spend on potatoes. She will purchase the first pound because it is worth $1.50 to her and it only costs a $1. She will purchase the second pound because it is worth $1.14. She has now spent her entire income on potatoes. She would like to purchase the third pound because the value of this pound of potatoes is $1.05, but she does not have the income to make this purchase. So, Janice will purchase 2 pounds of potatoes at a total cost of $2.00.

2. Pham can work as many or as few hours as she wants at the college bookstore for $12 per hour. But due to her hectic schedule, she has just 15 hours per week that she can spend working at either the bookstore or at other potential jobs. One potential job, at a café, will pay her $15 per hour for up to 6 hours per week. She has another job offer at a garage that will pay her $13 an hour for up to 5 hours per week. And she has a potential job at a daycare center that will pay her $11.50 per hour for as many hours as she can work. If her goal is to maximize the amount of money she can make each week, how many hours will she work at the bookstore? **LO1**

   Answer: 4.

   Feedback: Pham will choose to work at the bookstore as long as the wage rate at the bookstore exceeds her other opportunities. However, if another job offers a higher wage rate she will choose employment there. She will work until her total time allotment (for work) is exhausted.
   She will choose to work at the café for the full 6 hours because the wage rate at the café is $15 per hour, which is greater than the wage rate at the bookstore of $12. This leaves her with 9 hours of work time remaining. Next, she will choose to work at the garage for the full 5 hours because the wage rate here is $13, which again is greater than the bookstore wage rate $12. After this decision she only has 4 hours of work time remaining. She will choose to work these last 4 hours at the bookstore because the bookstore wage rate of $12 exceeds the daycare center wage rate of $11.50.

3. Suppose you won $15 on a lotto ticket at the local 7-Eleven and decided to spend all the winnings on candy bars and bags of peanuts. Candy bars cost $0.75 each while bags of peanuts cost $1.50 each. **LO5**
   a. Construct a table showing the alternative combinations of the two products that are available.
   b. Plot the data in your table as a budget line in a graph. What is the slope of the budget line? What is the opportunity cost of one more candy bar? Of one more bag of peanuts? Do these opportunity costs rise, fall, or remain constant as additional units are purchased?

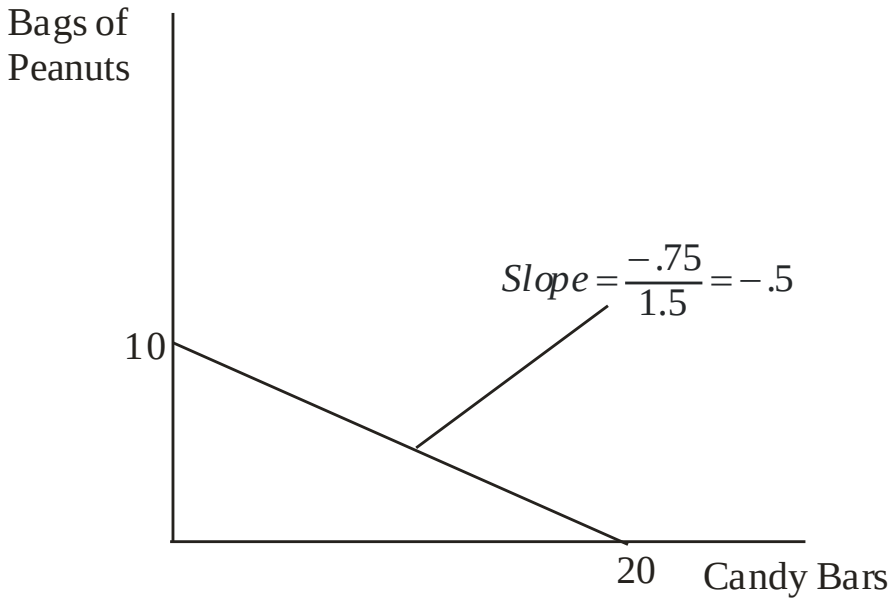
c. Does the budget line tell you which of the available combinations of candy bars and bags of peanuts to buy?
d. Suppose that you had won $30 on your ticket, not $15. Show the $30 budget line in your diagram. Has the number of available combinations increased or decreased?

Answers:
Part a:

Consumption alternatives

Goods	A	B	C	D	E	F
Candy bars	0	4	8	12	16	20
Bags of peanuts	10	8	6	4	2	0

Part b:

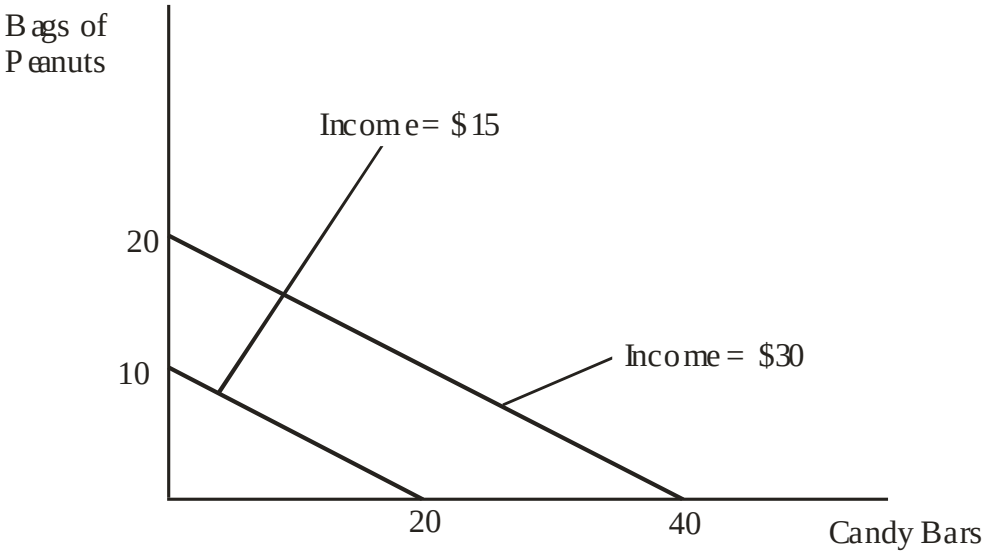


Feedback: The slope for the budget line above, with candy bars on the horizontal axis, is -0.5 (= $-P_{cb}/P_{bp}$). Note that the figure could also be drawn with bags of peanuts on the horizontal axis. The slope of that budget line would be -2. The opportunity cost of one more candy bar is ½ of a bag of peanuts. The opportunity cost of one more bag of peanuts is 2 candy bars. These opportunity costs are constant. They can be found by comparing any two of the consumption alternatives for the two goods.

Part c: No; it only tells you what is possible.

Feedback: The budget line does not tell you which of the available combinations of candy bars and bags of peanuts to buy. You will need to use your preference relationship for candy bars and bags of peanuts to determine which combination to buy. The budget line only tells you which combinations are feasible.

Part d: Increased.

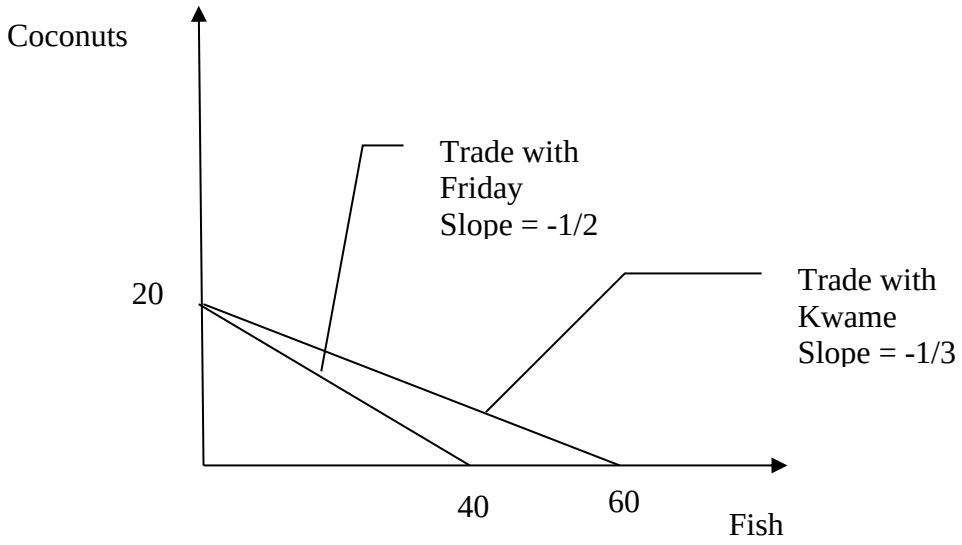


Feedback: The budget line at $30 would be preferable because it would allow greater consumption of both goods.

4. Suppose that you are on a desert island and possess exactly 20 coconuts. Your neighbor, Friday, is a fisherman, and he is willing to trade 2 fish for every 1 coconut that you are willing to give him. Another neighbor, Kwame, is also a fisherman, and he is willing to trade 3 fish for every 1 coconut. **LO5**
   a. On a single figure, draw budget lines for trading with Friday and for trading with Kwame. (Put coconuts on the vertical axis.)
   b. What is the slope of the budget line from trading with Friday?
   c. What is the slope of the budget line from trading with Kwame?
   d. Which budget line features a larger set of attainable combinations of coconuts and fish?
   e. If you are going to trade coconuts for fish, would you rather trade with Friday or Kwame? Why?

Answers:

Part a:



Part b: -1/2

Feedback: The slope of the budget line from trading with Friday equals -(1/2). This implies that for every coconut I give up, Friday must give up two fish. Or, for every fish that Friday gives up, I must give up (1/2) a coconut.

Part c: -1/3

Feedback: The slope of the budget line from trading with Kwame equals -(1/3). This implies that for every coconut I give up, Kwame must give up three fish. Or, for every fish that Friday gives up, I must give up (1/3) a coconut.

Part d: The budget line from trading with Kwame

Feedback: The budget line from trading with Kwame features a larger set of attainable combinations of coconuts and fish. Because Kwame is willing to give up more fish per coconut, you can consume more of both (assuming you make a trade). This implies that you would prefer to trade with Kwame.

Part e: Kwame

Feedback: Because Kwame is willing to give up more fish per coconut, you can consume more of both (assuming you make a trade). This implies that you would prefer to trade with Kwame.

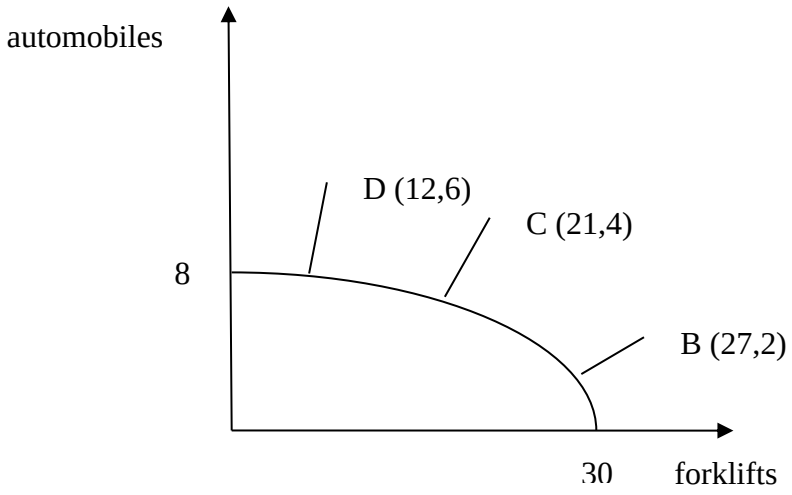
5. Below is a production possibilities table for consumer goods (automobiles) and capital goods (forklifts): **LO6**

	Production Alternatives				
Type of Production	A	B	C	D	E
Automobiles	0	2	4	6	8
Forklifts	30	27	21	12	0

   a. Show these data graphically. Upon what specific assumptions is this production possibilities curve based?
   b. If the economy is at point C, what is the cost of one more automobile? Of one more forklift? Which characteristic of the production possibilities curve reflects the law of increasing opportunity costs: its shape or its length?
   c. If the economy characterized by this production possibilities table and curve is producing 3 automobiles and 20 fork lifts, what could you conclude about its use of its available resources?
   d. Is production at a point outside the production possibilities curve currently possible? Could a future advance in technology allow production beyond the current production possibilities curve? Could international trade allow a country to consume beyond its current production possibilities curve?

   Answers:

   Part a: (See figure below.) The assumptions are full employment, fixed supplies of resources, fixed technology and two goods.



   Part b: 4 automobiles and 21 forklifts; its shape.

Feedback: Consider the following example:

	Production Alternatives				
Type of Production	A	B	C	D	E
Automobiles	0	2	4	6	8
Forklifts	30	27	21	12	0

Assume the economy is producing at point C. Thus, the economy is producing 4 automobiles and 21 forklifts.

The cost of producing one more automobile can be found by moving to point D and calculating the number of forklifts given up for the 2 additional automobiles. At point D the economy is producing 12 forklifts, which is a loss of 9 forklifts (moving from C to D) for the 2 additional automobiles. Thus the cost of 1 more automobile equals 9 (forklifts) divided by 2 (automobiles), or (9/2) = 4.5 forklifts.

The cost of producing one more forklift can be found in an equivalent fashion. First, we will move to point B (from point C). Here we must give up 2 automobiles to get 6 forklifts. Thus, the cost of 1 more forklift equals 2 (automobiles) divided by 6 (forklifts), which is (2/6) = (1/3).

In review, take the cost (loss) and divide by the gain. If we were at point D, the cost of one more forklift equals 2 automobiles (loss) divided by 9 forklifts (gain). Thus, the cost of 1 more forklift at point B is (2/9) automobiles.

Increasing opportunity cost implies that we must give up more of a particular good to get an additional unit of a different good. This implies as we move along the production possibilities curve (from left to right) I must give up more automobiles to get an additional forklift. Thus, the SHAPE of the schedule captures the increasing opportunity cost concept.

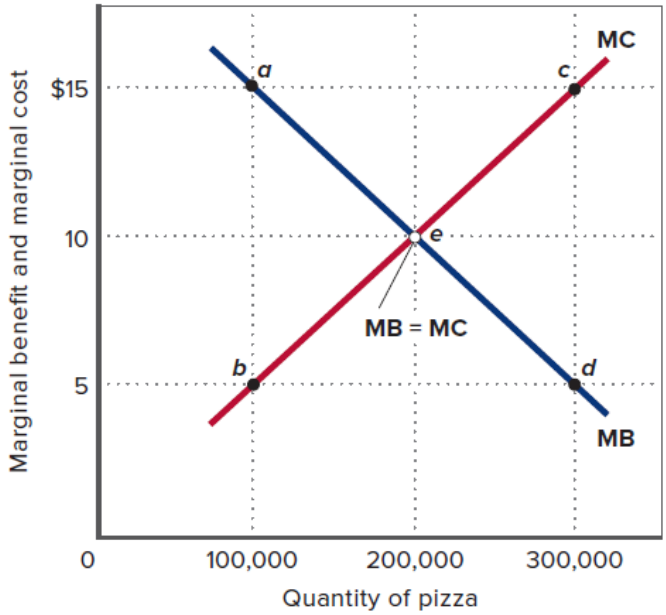
Part c: Underutilizing.

Feedback: The economy is underutilizing resources (inside the PPC).

Part d: No; Yes; Yes.

Feedback: No, the country cannot produce outside its PPC. Yes, a technological advance would shift the PPC outward allowing the country produce more with a given amount of inputs. Yes, by specializing in goods we have a comparative advantage producing we can trade to gain access to goods beyond our own PPC.

6. Look at Figure 1.3. Suppose that the cost of cheese falls, so that the marginal cost of producing pizza decreases. Will the MC curve shift up or down? Will the optimal amount of pizza increase or decrease? Explain. **LO6**



Answers: MC will shift down; the optimal amount of pizza will increase.

Feedback: To think about cost schedules we must think about input costs. If the cost of cheese falls, then the cost of making pizza is cheaper for all pizzas. This implies that the marginal cost schedule will shift down reflecting the lower input cost. For a given demand schedule, the optimal amount pizza produced and sold will increase and the equilibrium price would fall. The opposite story would apply if the cost of cheese were to increase.

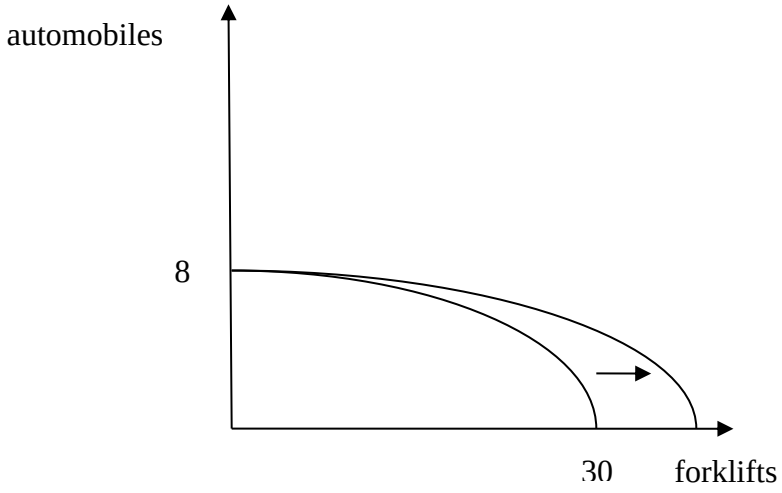
7. Referring to the table in problem 5, suppose improvement occurs in the technology of producing forklifts but not in the technology of producing automobiles. Draw the new production possibilities curve. Now assume that a technological advance occurs in producing automobiles but not in producing forklifts. Draw the new production possibilities curve. Now draw a production possibilities curve that reflects technological improvement in the production of both goods. **LO7**

	Production Alternatives				
Type of Production	A	B	C	D	E
Automobiles	0	2	4	6	8
Forklifts	30	27	21	12	0

Answers: See figures.

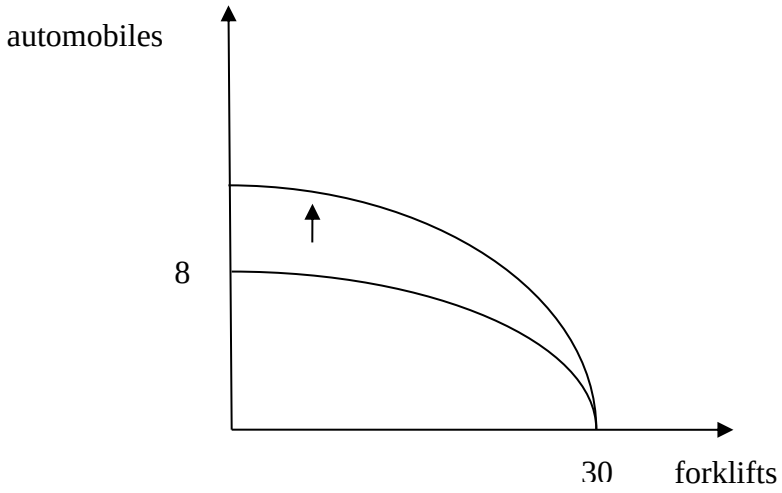
Technological advance in producing forklifts and not automobiles.

Feedback: This implies we can produce more forklifts with the given resources, so the schedule will shift out along the horizontal axis.



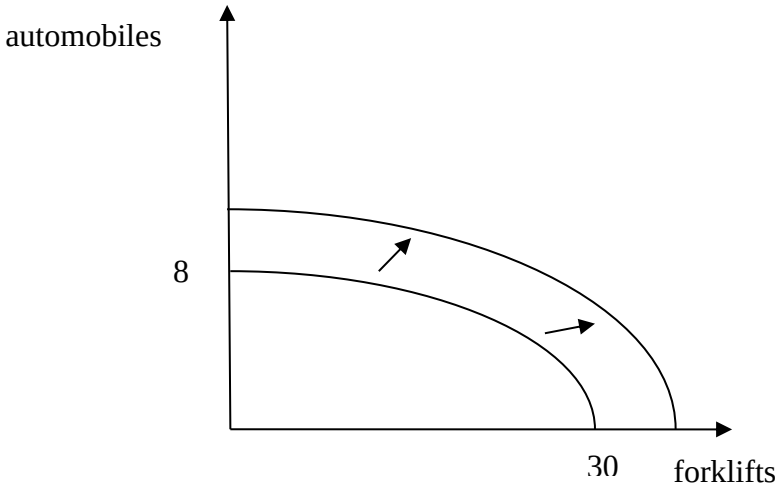
Technological advance in producing automobiles and not forklifts.

Feedback: This implies we can produce more automobiles with the given resources, so the schedule will shift up along the vertical axis.



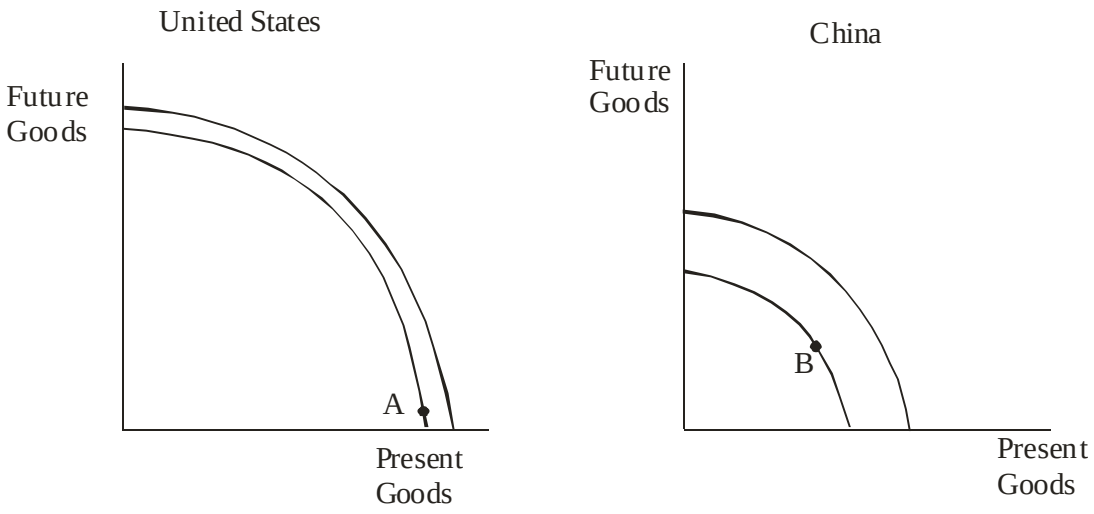
Technological in advance in producing automobiles and forklifts.

Feedback: This implies we can produce more forklifts and automobiles with the given resources, so the schedule will shift up out along the vertical and horizontal axes.



8. Because investment and capital goods are paid for with savings, higher savings rates reflect a decision to consume fewer goods for the present in order to be able to invest in more goods for the future. On average, households in China save 40 percent of their annual income each year, whereas households in the United States save less than 5 percent. At the same time, production possibilities are growing at roughly 7 percent annually in China and 3 percent in the United States. Use graphical analysis of "present goods" versus "future goods" to explain the differences in growth rates. **LO7**

Answers: See figures below



Feedback: Since the United States is consuming more today rather than saving, their production possibilities curve will shift out slower (less) over time because they are accumulating less capital. China's production possibilities curve will shift out faster (more) over time because they are accumulating more capital. See diagrams above.

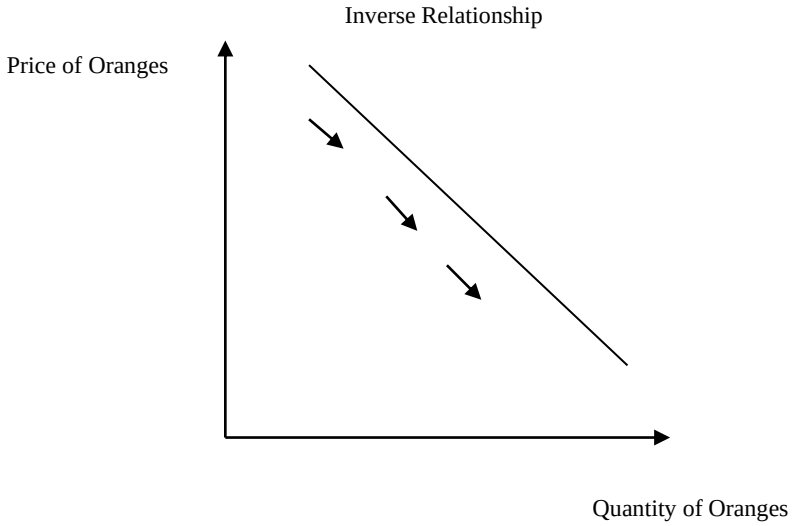
Chapter 01 Appendix

McConnell Brue Flynn 22e

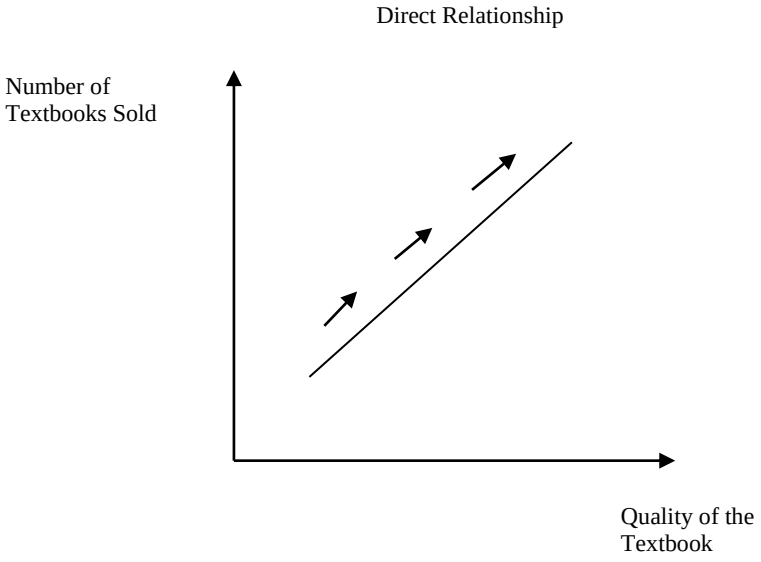
APPENDIX DISCUSSION QUESTIONS

1. What is an inverse relationship? How does it graph? What is a direct relationship? How does it graph? **LO8**

   Answer: Graphs help us visualize relationships between key economic variables in the data. For example, the relationship between the price of oranges and the number of oranges purchased is likely to be an inverse relationship. An inverse relationship is one where we observe one variable increasing and the other variable decreasing as a result (moving in opposite directions). Thus, as the prices of oranges increase we would expect to see a decrease in the quantity of oranges purchased. Graphically, we represent this inverse relationship as follows.



   As another example, the relationship between the quality of a textbook and the number of textbooks sold is likely to be a direct relationship. A direct relationship is one where we observe one variable increasing and the other variable increasing as a result (moving in the same direction). Thus, as the quality of the textbook increases the number of books sold also increases. Graphically, we represent this direct relationship as follows.



2. Describe the graphical relationship between ticket prices and the number of people choosing to visit amusement parks. Is that relationship consistent with the fact that, historically, park attendance and ticket prices have both risen? Explain. **LO8**

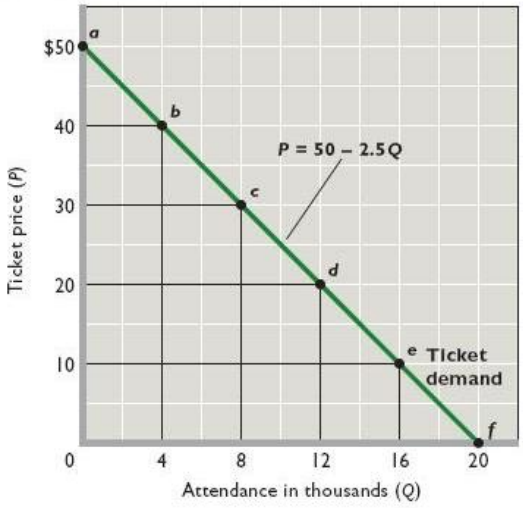
   Answer: There is likely an inverse relationship between ticket prices and the number of people visiting amusement parks. As ticket prices increase relative to other goods, people will spend their income on these other goods. For example, they may decide to go to the movies instead of visiting the now more expensive amusement park.

   The fact that, historically, park attendance and ticket prices have both risen over time does not change our story. This relationship is most likely the result of a change in demand, not a change in quantity demanded. The demand schedule for amusement parks has probably shifted to the right (an increase in demand) over time leading to an increase in attendance and prices.

3. Look back at Figure 2, which shows the inverse relationship between ticket prices and game attendance at Gigantic State University. (a) Interpret the meaning of both the slope and the intercept. (b) If the slope of the line were steeper, what would that say about the amount by which ticket sales respond to increases in ticket prices? (c) If the slope of the line stayed the same but the intercept increased, what could you say about the amount by which ticket sales respond to increases in ticket prices? **LO8**

FIGURE 2 **Graphing the inverse relationship between ticket prices and game attendance.** Two sets of data that are negatively or inversely related, such as ticket price and the attendance at basketball games, graph as a downsloping line.

Ticket Price	Attendance, Thousands	Point
$50	0	*a*
40	4	*b*
30	8	*c*
20	12	*d*
10	16	*e*
0	20	*f*



Answer:

Part a: The slope of this relationship tells us how much the price of a ticket must fall to induce someone to buy an additional ticket. In this case, the slope of -2.5 tells us that the price must fall by $2.50 to sell one more ticket (or to induce someone to buy one more ticket). The vertical intercept tells us the price at which no tickets will be sold. Here, this price is $50. Combining these two components tells us that if the initial price is $50 per ticket and the price falls to $40, then 4 tickets will be purchased (one for each reduction in price of $2.50, which is the slope).

Part b: If the slope of this line were steeper this would imply that the price must fall by more than $2.50 to sell one more ticket. Or, thinking about this in the other direction, a steeper line would result in a smaller decrease in tickets purchased for a given increase in price. In other words, ticket sales (purchases) are less responsive to price movements.

Part c: If the vertical intercept increased this would imply that individuals are willing to purchase more tickets at every price. This will be an increase in the demand for tickets. This will not affect the slope or the quantity response to a change in the price of tickets. We still have the relationship that the price must fall by $2.50 to sell one more ticket (or to induce someone to buy one more ticket).

APPENDIX REVIEW QUESTIONS

1. Indicate whether each of the following relationships is usually a direct relationship or an inverse relationship. **LO8**
   a. A sports team's winning percentage and attendance at its home games.
   b. Higher temperature and sweater sales.

c. A person's income and how often they shop at discount stores.
d. Higher gasoline prices and miles driven in automobiles.

Answer:
a. Direct relationship because winning reams are typically more popular.
b. Inverse relationship because as higher temperatures people usually purchase fewer sweaters
c. Inverse relationship because as people get richer, they typically shop less often at discount stores.
d. Inverse relationship because higher gas prices cause most people to cut back on their driving.

2. Erin grows pecans. The number of bushels *(B)* that she can produce depends on the number of inches of rainfall *(R)* that her orchards get. The relationship is given by the following equation: $B = 3{,}000 + 800R$. Match each part of this equation with the correct term. **LO8**

B	slope
3,000	dependent variable
800	vertical intercept
R	independent variable

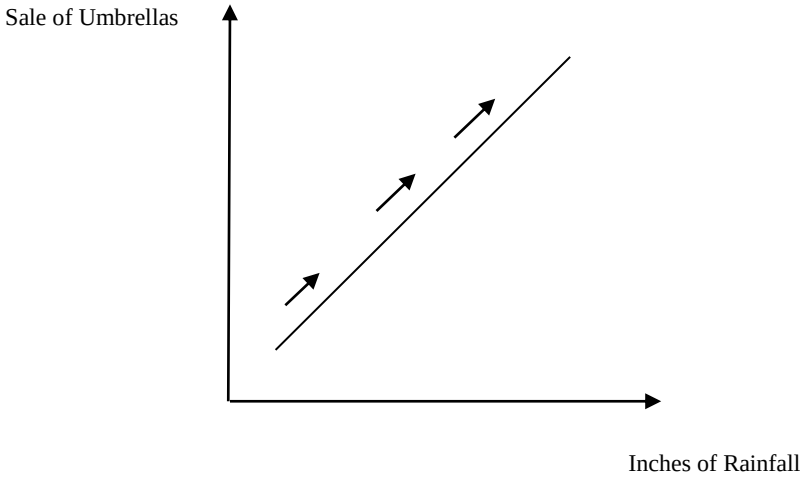
Answer:
B goes with dependent variable.
3,000 goes with vertical intercept.
800 goes with slope.
R goes with independent variable.

APPENDIX PROBLEMS

1. Graph and label as either direct or indirect the relationships you would expect to find between (a) the number of inches of rainfall per month and the sale of umbrellas, (b) the amount of tuition and the level of enrollment at a university, and (c) the popularity of an entertainer and the price of her concert tickets. **LO8**

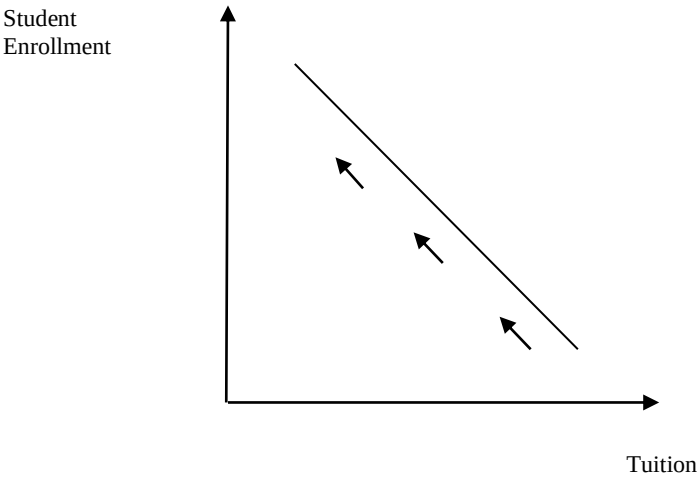
Answer:
Part a:

Direct Relationship

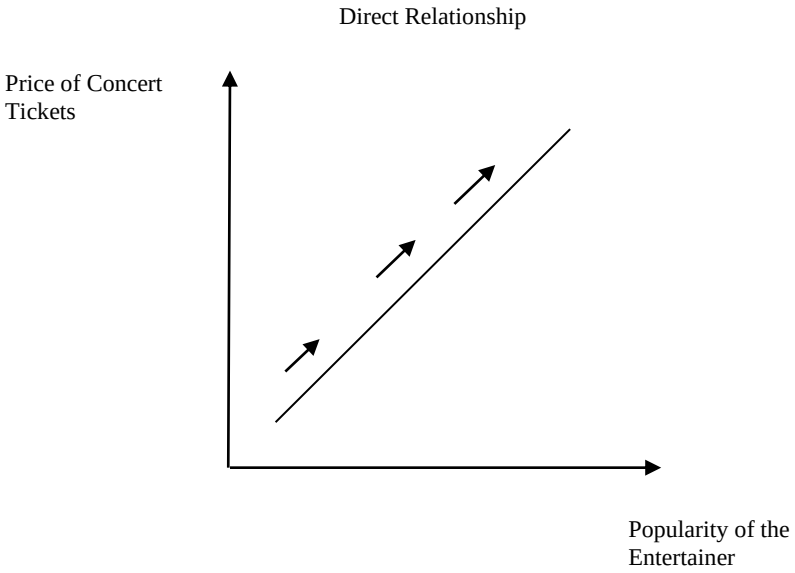


Part b:

Inverse Relationship

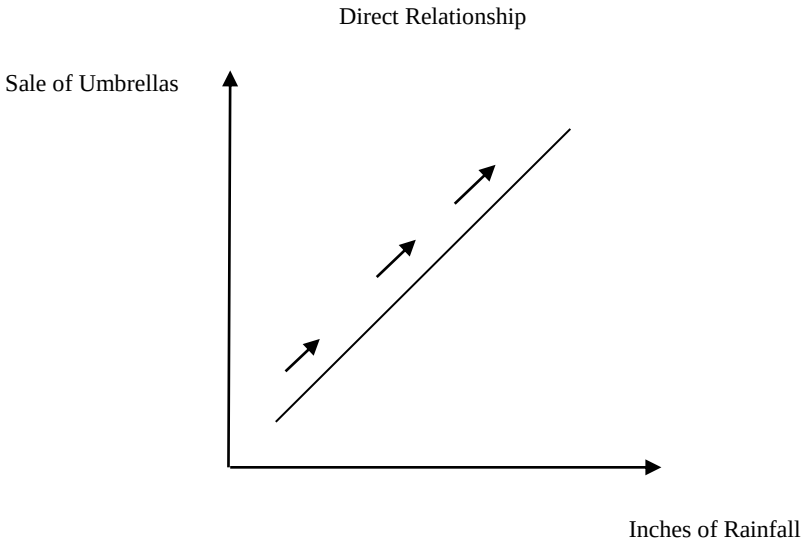


Part c:

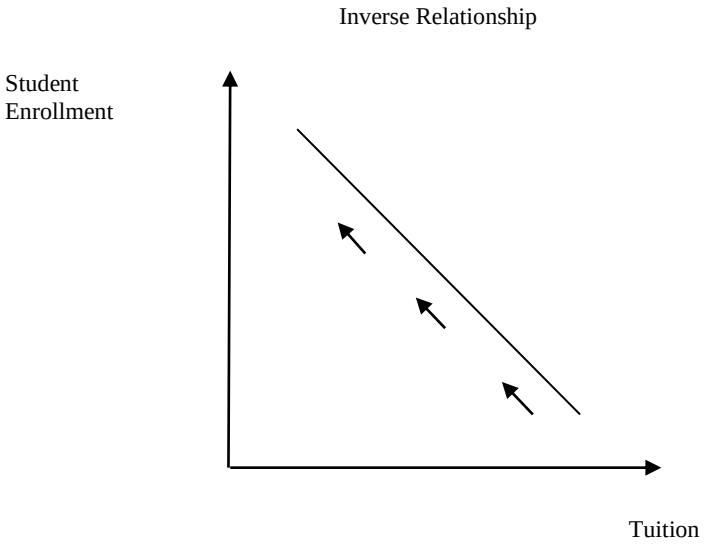


Feedback: Consider the following situations:

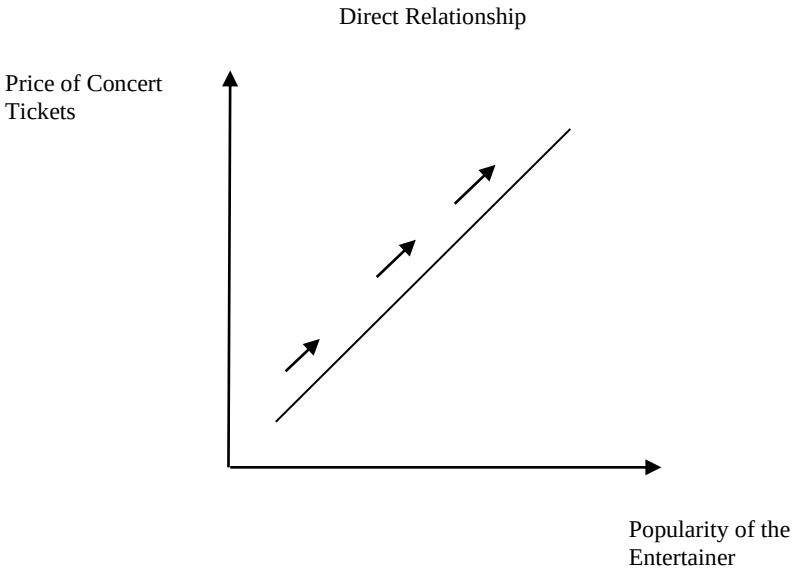
Part a: The number of inches of rainfall per month and the sale of umbrellas: There is likely a direct relationship between the number of inches of rainfall per month and the sale of umbrellas (more rain implies more umbrellas).



Part b: The amount of tuition and the level of enrollment at a university: There is likely an inverse relationship between the amount of tuition and the level of enrollment at a university. As tuition increases less students will attend the university.



Part c: The popularity of an entertainer and the price of her concert tickets: There is likely a direct relationship between the popularity of an entertainer and the price of her concert tickets. The more popular the entertainer, the more people are willing to pay to see her in concert.



2. Indicate how each of the following might affect the data shown in the table and graph in Figure 2 of this appendix: **LO8**
   a. GSU's athletic director schedules higher-quality opponents.

b. An NBA team locates in the city where GSU plays.
c. GSU contracts to have all its home games televised.

Answer: (a) increase in demand; shift to the right; (b) decrease in demand; shift to the left; (c) decrease in demand; shift to the left.

Feedback: Consider the three scenarios:

Part a: By scheduling higher quality opponent the will be an increase in demand. That is, more tickets will be purchased at every price. The demand schedule will shift to the right.

Part b: If an NBA team locates in the same city, this will reduce demand because the NBA team's games are likely a substitute for GSU's games. That is, fewer tickets will be purchased at every price. The demand schedule will shift to the left.

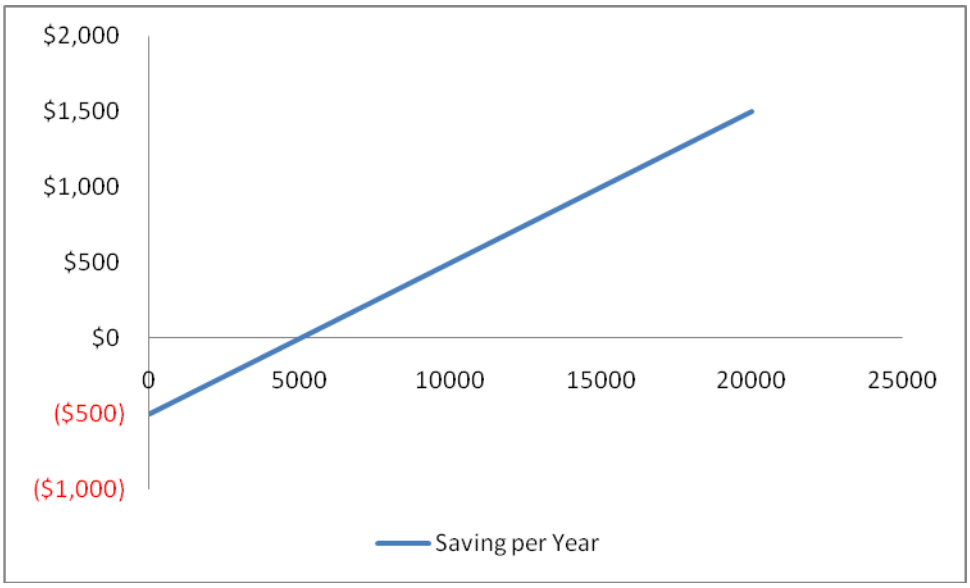
Part c: If GSU contracts to have all its home games televised, this will reduce demand because individuals can watch the game on television. That is, fewer tickets will be purchased at every price. The demand schedule will shift to the left.

3. The following table contains data on the relationship between saving and income. Rearrange these data into a logical order and graph them on the accompanying grid. What is the slope of the line? The vertical intercept? Write the equation that represents this line. What would you predict saving to be at the $12,500 level of income? **LO8**

Income per Year	Saving per Year
$15,000	$1,000
0	−500
10,000	500
5,000	0
20,000	1,500

Answer:

Income per Year	Saving per Year
0	-$500
$5,000	0
$10,000	$500
$15,000	$1,000
$20,000	$1,500



Slope equals (500/5000) or 0.10; the vertical intercept equals -$500. The equation representing this data is : Saving = -$500 + 0.1 x Income. The predicted level of saving is $750.

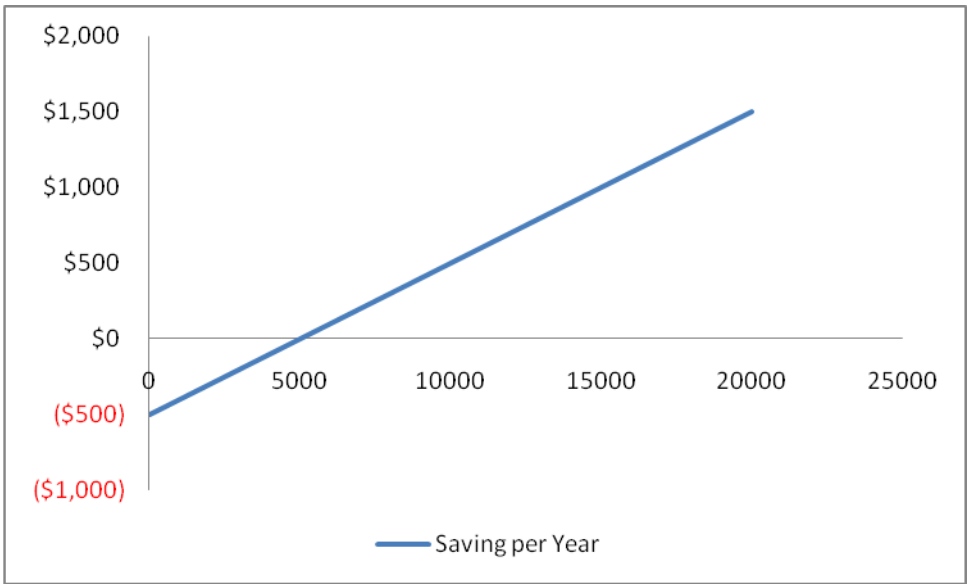
Feedback: Consider the following data:

Income per Year	Saving per Year
$15,000	$1,000
0	-$500
$10,000	$500
$5,000	0
$20,000	$1,500

To rearrange the above data into a meaningful order, we start with the lowest income and saving pair. We then continue with sequentially higher values of both income and saving. The reason for this ordering is that economic theory (and data) suggests that as income increases so does saving. The data are reordered as follows (you could also reorder from highest to lowest, but this is less intuitive).

Income per Year	Saving per Year
0	-$500
$5,000	0
$10,000	$500
$15,000	$1,000
$20,000	$1,500

Graphically, we have the following.

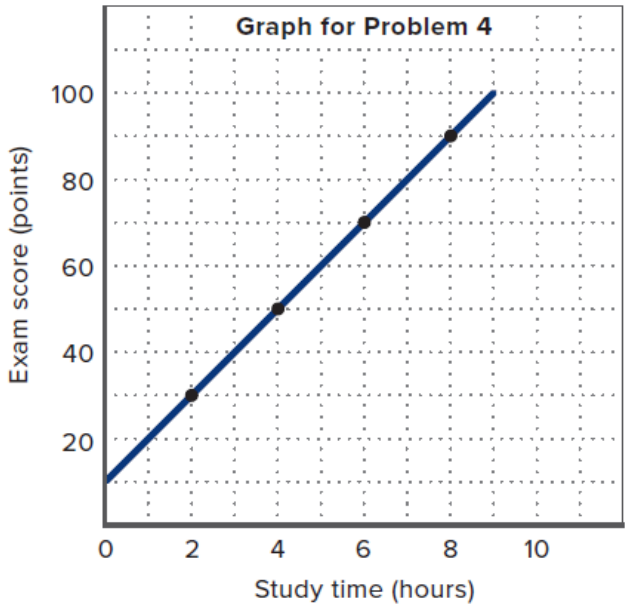


The slope of the saving line can be found by dividing the change in saving by the change in income between any two points. For example we have the entry (5000 (income), 0 (savings)) and the entry (10000 (income), 500 (savings)). This implies that the change in saving equals 500 minus zero (= 500) and the change in income equals 10000 minus 5000 (= 5000), therefore the slope equals (500/5000) or 0.10. That is, for every additional dollar an individual earns (net income) he or she will save 10 cents and consume 90 cents. The vertical intercept equals -$500. This implies that if the individual does not earn an income he or she either borrows $500 or reduces past savings (stock variable) by $500.

The equation representing this data is : Saving = -$500 + 0.1xIncome.

To find the predicted amount of saving for a given level of income we substitute the income level into the equation above. For example if income equals $12,500, then the predicted level of saving equals -$500 + (0.1 × $12,500). Thus the predicted level of saving is $750 (= -$500 + $1,250).

4. Construct a table from the data shown on the graph below. Which is the dependent variable and which the independent variable? Summarize the data in equation form. **LO8**



Answer:

Study Time (hours)	Exam Score (points)
0	10
2	30
4	50
6	70
8	90
9	100

The dependent variable is Exam Score (points); Study Time (hours) is the independent variable. Thus, the equation representing this relationship is: Exam Score = 10 + (10 × Study Time).

Feedback: The table for this data is as follows:

Study Time (hours)	Exam Score (points)
0	10
2	30
4	50
6	70
8	90
9	100

The dependent variable is Exam Score (points) because we assume Study Time (hours) influences your score. The more hours you spend studying will increase your exam score. This means that Study Time (hours) is the independent variable.

The vertical intercept for this relationship is your exam score if you choose not to study (zero hours). From the table above this value is 10.

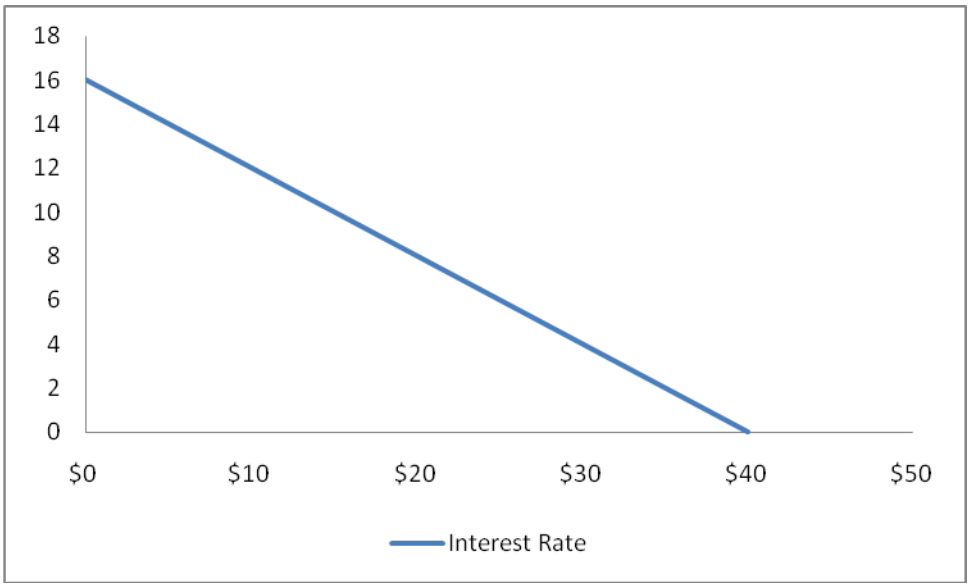
To find the slope we divide the change in your Exam Score by the change in Study Time for any two points. For example, we have the entry 2 (study time), 30 (exam score) and the entry (4, 50). This implies the slope equals (50 – 30) divided by (4 – 2), which equals 20/2, or 10. For every additional hour you spend studying your exam score will increase by 10 point. Thus, the equation representing this relationship is: Exam Score = 10 + (10 × Study Time).

5. Suppose that when the interest rate on loans is 16 percent, businesses find it unprofitable to invest in machinery and equipment. However, when the interest rate is 14 percent, $5 billion worth of investment is profitable. At 12 percent interest, a total of $10 billion of investment is profitable. Similarly, total investment increases by $5 billion for each successive 2-percentage-point decline in the interest rate. Describe the relevant relationship between the interest rate and investment in a table, on a graph, and as an equation. Put the interest rate on the vertical axis and investment on the horizontal axis. In your equation use the form $i = a + bI$, where i is the interest rate, a is the vertical intercept, b is the slope of the line (which is negative), and I is the level of investment. **LO8**

Answer:

Interest rate (in percent)	**Amount of investment (billions of dollars)**
16	**$ 0**
14	**5**
12	**10**
10	**15**
8	**20**
6	**25**
4	**30**
2	**35**
0	**40**

Equation: i = 16 - (2/5)I or I = 16 – (0.4)I



Feedback: Consider the following data as an example:
Suppose that when the interest rate on loans is 16 percent, businesses find it unprofitable to invest in machinery and equipment. However, when the interest rate is 14 percent, $5 billion worth of investment is profitable. At 12 percent interest, a total of $10 billion of investment is profitable. Similarly, total investment increases by $5 billion for each successive 2-percentage-point decline in the interest rate.

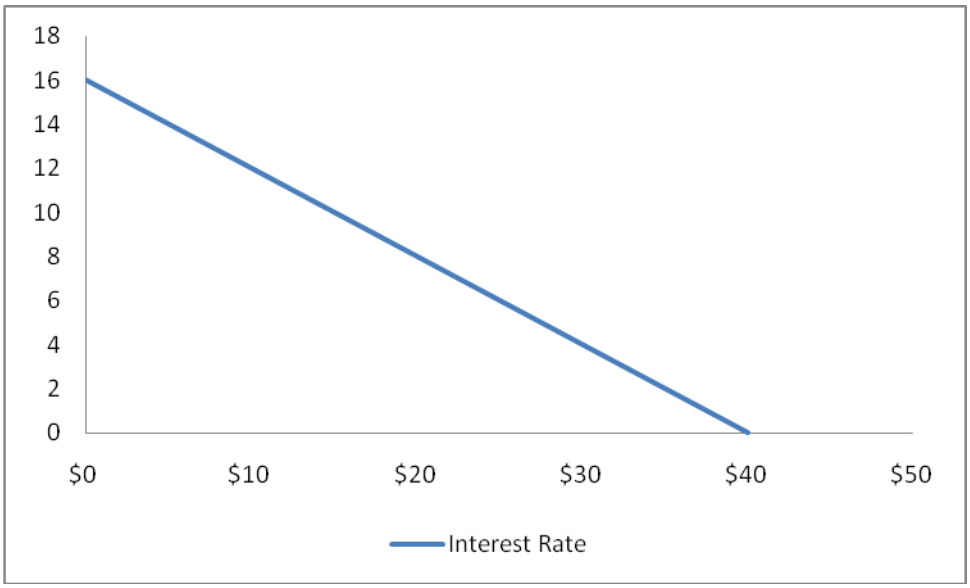
Interest rate (in percent)	Amount of investment (billions of dollars)
16	$ 0
14	5
12	10
10	15
8	20
6	25
4	30
2	35
0	40

When the interest rate is 16%, investment spending will be zero. When the interest rate is 14%, investment spending will be $5 billion. For each successive drop of 2 percentage points in the interest rate, investment spending will increase by $5 billion.

Using equation $i = a - bI$

$$i = 16 - [(16-14)/(5-0)] \times I$$
$$= 16 - \left(\frac{2}{5}\right)I$$
$$= 16 - 0.4I$$

Graphically we have the following relationship.



6. Suppose that $C = a + bY$, where C = consumption, a = consumption at zero income, b = slope, and Y = income. **LO8**
   a. Are C and Y positively related or are they negatively related?
   b. If graphed, would the curve for this equation slope upward or slope downward?
   c. Are the variables C and Y inversely related or directly related?
   d. What is the value of C if a = 10, b = .50, and Y = 200?
   e. What is the value of Y if C = 100, a = 10, and b = .25?

   Answers: (a) positively related; (b) upward; (c) directly related; (d) C = 110; (e) Y = 360.

   Feedback:

   (a) C and Y are positively related because the slope, b, is positive by assumption. As individual income increases the individual will spend some of this additional income on consumption.

   (b) The curve would slope upward because the slope is positive.

   (c) C and Y are directly related because C and Y are positively related (move in the same direction).

(d) Consider the following values: If a = 10, b = .50, and Y = 200, then C = 110. If a = 10 and b = .50, then the consumption function takes the following form C = 10 + 0.50 x Y. If income equals 200, Y = 200, then consumption at this level of income equals C = 10 + 0.50 x 200 = 110.

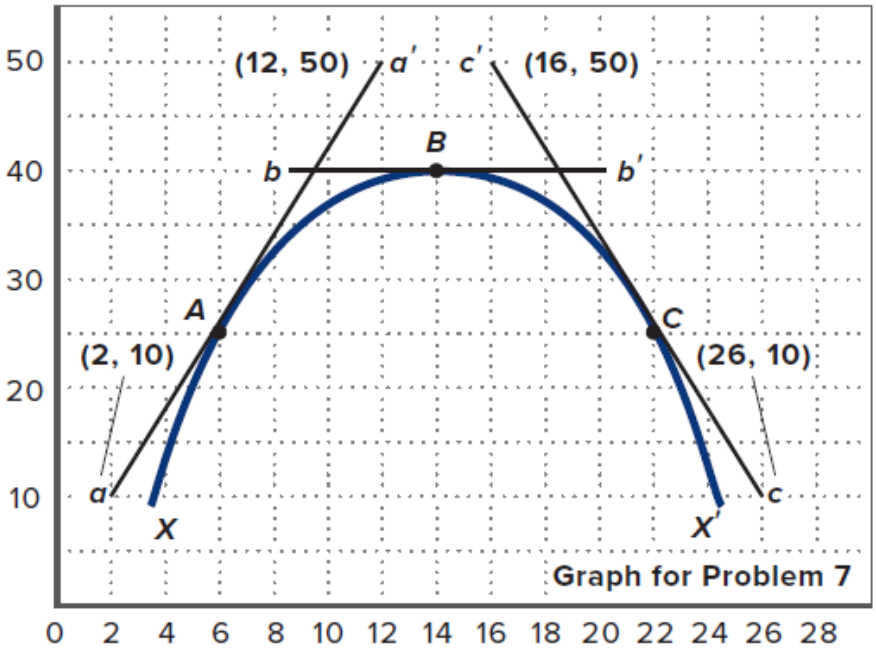
(e) Consider the following values: Y if C = 100, a = 10, and b = .25, then Y = 360. If a = 10 and b = .25, then the consumption function takes the following form C = 10 + 0.25 x Y. We can solve for Y as a function of C.

STEP 1: 0.25 x Y = C - 10

STEP 2: Y = (1/0.25) x C - (10/0.25) = 4 x C - 40

STEP 3: Substitute in the value of consumption given, C = 100. Y = 4 x 100 - 40 = 360.

7. The accompanying graph shows curve *XX*' and tangents at points *A*, *B*, and *C*. Calculate the slope of the curve at these three points. **LO8**



Answer: Point A, slope = 4; Point B, slope = 0; Point C, slope = -4.

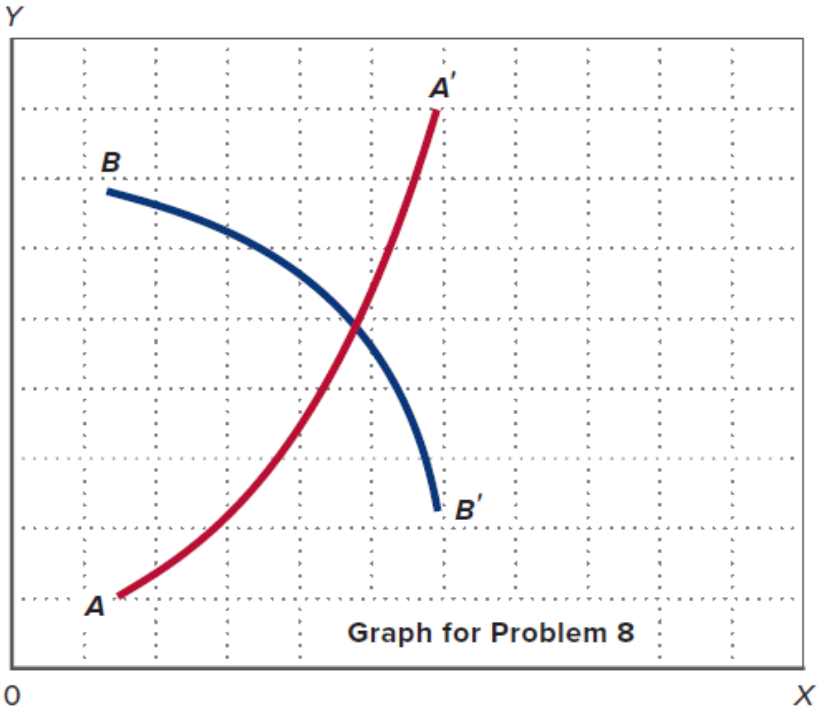
Feedback: To calculate the slope of the function use the "rise-over-run" approach. The "rise" is the change in the variable on vertical axis as you move between entries (points) and the "run" is the change in the variable on the horizontal axis as you move between the SAME two entries (points).

Point A has a slope that equals 4. To see this, we use the two entries (2,10) and (12,50). The "rise" equals 50 - 10 = 40. The "run" equals 12 - 2 = 10. To find the slope we use the rule "(rise/run)", which equals (40/10) = 4.

Point B has a slope equal to zero. There is no "rise" here, so we do not need coordinates to calculate this value.

Point C has a slope that equals -4. To see this, we use the two entries (16,50) and (26,10). The "rise" equals 10 - 50 = -40 (note that "rise" can be negative). The "run" equals 26 - 16 = 10. To find the slope we use the rule "(rise/run)", which equals (-40/10) = -4.

8. In the accompanying graph, is the slope of curve *AA*' positive or negative? Does the slope increase or decrease as we move along the curve from *A* to *A*'? Answer the same two questions for curve *BB*'.



Answer: Slope of *AA*' is positive; increases; Slope of *BB*' is negative; decreases.

Feedback: Slope of *AA*' is positive (rising from left to right). The slope increases as we move from *A* to *A*'.

Slope of *BB*' is negative (dropping from left to right). The slope becomes more negative, thereby decreasing, as we move from B to B'.

Chapter 1

Limits, Alternatives, and Choices

TEACHING GUIDE CONTENTS

CONNECT CONTENT MATRIX FOR CHAPTER 1

Chapter 1: Limits, Alternatives, and Choices	
SmartBook 2.0	Limits, Alternatives, and Choices
End of Chapter Exercises	
Video (Connect the Dots)*	PPF Shifts and Pivots
	Tradeoffs
	PPF Efficiency
Interactive Graph: Production Possibilities*	Production Possibilities 1 (Opportunity Costs)
	Production Possibilities 2 (Efficient and Attainable)
Interactive Graph: Graphing Linear Equations*	Graphing Linear Equations: Introduction to the Interactive Graph
	Graphing Linear Equations: Understanding Slope
	Graphing Linear Equations: Calculating Slope
	Graphing Linear Equations: Calculating Slope (Algo) (Variation 1)
	Graphing Linear Equations: Calculating Slope (Algo) (Variation 2)
	Graphing Linear Equations: Points on a Line 1 (Algo)
	Graphing Linear Equations: Points on a Line 2 (Algo)
	Graphing Linear Equations: Points on a Line 3 (Algo)
	Graphing Linear Equations: Points on a Line 4 (Algo)
	Graphing Linear Equations: Intercept-Slope Form (Algo)
	Graphing Linear Equations: Intercept-Slope Form (Algo)
	Graphing Linear Equations: Intercept-Slope Form - Application (Algo)
	Graphing Linear Equations: Intercept-Slope Form - Application (Algo)
	Graphing Linear Equations: Two-Point Form 1 (Algo)
	Graphing Linear Equations: Two-Point Form 2 (Algo)
	Graphing Linear Equations: Two-Point Form - Application (Algo) (Variation 1)
	Graphing Linear Equations: Two-Point Form - Application (Algo) (Variation 2)
	Graphing Linear Equations: Two-Point Form - Application (Algo) (Variation 3)
	Graphing Linear Equations: Two-Point Form - Experimentation (Algo)
	Graphing Linear Equations: Slope-Intercept Form - Experimentation (Algo)
Interactive Graph: Graphing Quadratic Equations*	Graphing Quadratic Equations: Introduction to the Interactive Graph
	Graphing Quadratic Equations: Slopes Along a Curve (Algo)
	Graphing Quadratic Equations: Slopes Along a Curve (Algo)
	Graphing Quadratic Equations: Describing a Curve Using Its Tangent (Variation 1)

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	Graphing Quadratic Equations: Describing a Curve Using Its Tangent (Variation 2) (Algo)
	Graphing Quadratic Equations: Estimating Slopes on a Curve 1
	Graphing Quadratic Equations: Estimating Slopes on a Curve 1 (Algo)
	Graphing Quadratic Equations: Estimating Slopes on a Curve 2 (Algo)
	Graphing Quadratic Equations: Slopes and Cost Calculations (Algo)
	Graphing Quadratic Equations: Slopes and Cost Calculations (Algo)
	Graphing Quadratic Equations: Slopes and Profit (Algo)
Economics and Ethics Discussion Questions*	An Ethical Dilemma, a Common Example In Many Discussions
	Scarcity and Household Decisions
	Scarcity and Parenting
	Scarcity and The Allocation of Resources
	Scarcity and The Allocation of Resources (Alternative version)
	Cost-Benefit Analysis and Decision Making
	Decision Making
	Economic Growth and Intertemporal Choices
Test Bank	

*All content marked with an asterisk is available for assignment in the “additional content” menu in the Connect question picker.
**The full Connect Content Matrix for the entire product can be found in the Instructor’s Resource Page.

WHAT'S NEW IN CHAPTER 1

We have made a major push in this 22nd edition (22e) to streamline the presentation to make it faster to read and easier for busy students to digest the key ideas and concepts.

To that end, this and all subsequent chapters have been edited to "cut out the fat." For instance, secondary and tertiary examples have in many cases been eliminated (but only if the primary example was sufficient on its own).

Space was saved by in some instances by eliminating entire LO sections or subsections within a given LO. But those deletions are relatively few. For the most part, our editorial process involved tightening up language (e.g., active voice sentences are usually shorter than passive voice sentences) and streamlining the presentation. So, if you do a side-by-side comparison of the 21st edition and the 22nd edition, you will see a large number of small changes. That is by design.

Any changes in the main body of a chapter caused the author team to modify the end-of-chapter and ancillary content as appropriate. So, there are matching changes to the Summaries, Terms and Concepts, and Questions and Problems within the book itself as well as matching changes in our ancillary materials, including our PPT slides, test banks, and even this Teaching Guide.

The total number of chapters remains the same (28) but the titles and topics of Chapters 4 and 5 have been heavily revised and rearranged. All other chapters retain their previous titles and topics.

We have also totally revised our graphs, figures, charts, and tables to ensure accessibility.

Chapter 1: Limits, Alternatives, and Choices

As with the rest of the book, Chapter 1 features edits to streamline the presentation. There are scores of these, but they do not for the most part affect content or the breadth of coverage. When they do, parallel changes were made to the end-of-chapter material.

Here are the more substantial *content* changes in Chapter 1:

- The Consider This (CT) boxed piece titled "Free for All" has been replaced with **a new CT titled, "Is Facebook Free?"**

- The CTs about “Fast Food Lines” and “The Economics of War” have been removed.
- **The CT about celebrities skipping college has been updated,** with Ariana Grande replacing Taylor Swift.
- The Last Word (LW) on “Pitfalls to Sound Economic Reasoning,” has been replaced by **a new Last Word that explains how Starbucks uses marginal analysis** to make business decisions.
- There is **a new Global Perspective** on “Gross Capital Formation as a Percentage of National Income” in the section that deals with the PPF.

TEACHING GUIDE: SUGGESTIONS FOR IMPLEMENTATION

The purpose of this Teaching Guide is to support you in the delivery of your chosen curriculum in either a face-to-face or online classroom format. It also was created to help you address some of the **following challenges in higher education:**

- Addressing the inability to measure student comprehension prior to major assignments such as a midterm or project.
- Overcoming the inability to tailor your lecture to the topics that students find difficult.
- Increasing student engagement by providing opportunities for them to apply the knowledge gained in the classroom to real-world scenarios.
- Providing students with opportunities for self-reflection outside of classroom activities.
- Increasing students' critical-thinking and problem-solving skills.

You will learn that we created many different teaching resources you can use either before, during, or after class. Because of the quantity of options, the goal of this implementation guide is to provide an overview of how you might select the many teaching resources at your disposal.

So What Assets Can I Chose From?

Generally, a typical class session for any course comprises three touch points: before, during, and after class. For a face-to-face course, your class session would normally be the day you lecture to students. For an online course, the class session would be when you recorded the lecture or when the live lecture is streamed on the Web.

Our teaching resources fall into ten categories:

- **SmartBook 2.0** SmartBook 2.0 makes study time as productive and efficient as possible. Students move between reading and practice modes to learn the content within the chapter. As they progress, the adaptive engine identifies knowledge gaps and offers up content to reinforce areas of weakness. Clickpath in Connect: HOME > Add Assignment > LearnSmart
- **Connect® Exercises (Test Bank and End-of-Chapter)** End-of-chapter problems reinforce chapter content through a variety of question types including questions that make use of the graphing tool. Problems with algorithmic variations are also available.

Clickpath in Connect: HOME > Add Assignment > Question Bank > Chapter X > Exercises

- **Application-Based Exercises (ABAs)** New immersive real-life scenarios engage students and put them in the role of everyday economists. Students practice their economic thinking and problem-solving skills as they apply course concepts, and see the implications of their decisions as they go. Each activity is designed as a 15-minute experience, unless students eagerly replay for a better outcome.
  Clickpath in Connect: HOME > Add Assignment > Application-Based Activity
- **"Connect the Dots" Videos** The "Connect the Dots" video series takes important economic concepts and explains them in an engaging, relatable manner. Patrick Walsh walks students through examples that help contextualize concepts in ways that make them easier to understand and apply. Each includes a related assessment item to test student understanding.
  Clickpath in Connect: HOME > Add Assignment > Question Bank > Course-Wide Content Dropdown Tab > Connect the Dots Videos (2.0, MHE)
- **Interactive Graph Assignments** These are designed to help students visualize and interpret economic concepts, graphs, and real data. All graphs are accompanied by assignable assessment questions and feedback to guide students through the experience of learning to read and interpret graphs and data.
  Clickpath in Connect: HOME > Add Assignment > Question Bank > Course-Wide Content Dropdown Tab > Interactive Graphs (2.0, MHE)
- **Math Preparedness Video Assignments** Our Math Prep Videos can be assigned as a refresh for students to revisit and practice important concepts. Each includes a brief introductory video, an explanation of the concept, and assessment items to measure mastery.
  Clickpath in Connect: HOME > Add Assignment > Question Bank > Course-Wide Content Dropdown Tab > Math Preparedness (2.0 MHE)
- **Economics and Ethics Discussion Questions** Over 60 discussion questions that highlight the challenge of ethical decision making within the economic study of allocating resources. Set-up as multiple-choice questions without a correct answer, just an explanation to help spur discussion. All ethical dilemmas are wrapped around standard economic topics like price discrimination and scalping, the Edgeworth box and Pareto optimality, interest and usury outsourcing, environmentalism as a normal/luxury good, and more.
  Clickpath in Connect: HOME > Add Assignment > Question Bank > Course-Wide Content Dropdown Tab > Economics and Ethics Discussion Questions (Beta, MHE)

- **TUCE Questions** Sixty multiple-choice questions designed to help students prepare for the standardized economics tests that target their knowledge of principles-level topics in economics.
  Clickpath in Connect: HOME > Add Assignment > Question Bank > Course-Wide Content Dropdown Tab > TUCE Questions (1.0, MHE)

Assigning SmartBook 2.0 and Connect® Exercises

Connect® gives you a wide array of flexibility in making assignments and creating grading policies. You may choose to:

- Assign as many assignments as appropriate.
- Determine point values for each question/application exercise individually.
- Make available multiple attempts per assignment with options of accepting the highest score or averaging all the scores together.
- Deduct points for late submissions of assignments (percentage deduction per hour/day/week/so forth) or create hard deadlines.
- Show feedback on exercises/questions immediately or at your preference.
- Provide for study-attempts to allow for completion of the assignment after the due date without assigning a point value.

Some recommendations include:

- Before selecting the option for one attempt only, select unlimited or multiple attempts on the first few assignments to allow students a chance to learn and navigate the system.
- Provide a low point value for each question because multiple questions are usually assigned for each chapter. A good rule of thumb would be to make test bank questions worth 1 point each and Connect exercises like the end-of-chapter problems worth 5 to 10 points each because these require more time and thought.
- Select feedback to be displayed after the assignment due date in order to limit students from giving the correct answers to other students while the application exercise is still available.

So When Do I Assign Each Type of Teaching Resource?

Wouldn't it be wonderful if you could transition from simply assigning readings, lecturing, and testing to actually adapting your teaching to student needs? By utilizing the teaching resources outlined below during the three touch points, you can significantly impact students' learning and create a learning environment that is more engaging, involving, and rewarding. In other words, you can now tailor your classrooms to pinpoint and address critical challenges, thereby creating the greatest impact and assisting students develop higher-order thinking skills.

You can identify which of the other resources can be used with the Connect Content Matrix.

Before Class

The learning goals we have for students determine our assignments before, during, and after class. For example, you may want to focus on mastering content, applying content, or using content to solve problems. Alternatively, you may want to achieve all three goals.

A reading assignment—typically a chapter from the product in use—is a student's initial exposure to course content. Requiring students to complete a SmartBook 2.0 module prior to class or an online lecture allows you to gauge their comprehension of the material. Having a better sense *before* class of which concepts your students are "getting" and which ones they are not, allows you to more effectively and efficiently plan your time with them *during* class. To ascertain student competency, use the reporting function of SmartBook 2.0, where you can view general results of their performance. Below is a screenshot of a general results report. In the sample report of student comprehension by topic, note the percent of questions answered correctly in the last column of the report.

Sample Report of Student Comprehension by Topic shows you what topics students are struggling with.

Self-study work
Number of assigned items: 73

Chapter section	Average time spent (hh:mm:ss)	Average questions per student correct / total	Correctness 0% 100%
Global Management Managing across Borders	0:05:27	55 / 73	75%
4.1 Globalization: The Collapse of Time & Distance	0:00:41	7 / 8	86%
4.2 You & International Management	0:00:29	5 / 6	82%
4.3 Why & How Companies Expand Internationally	0:01:04	11 / 14	76%
4.4 The World of Free Trade: Regional Economic Cooperation	0:01:35	16 / 21	78%
4.5 The Importance of Understanding Cultural Differences	0:01:36	16 / 24	67%

Additionally, Connect® exercises, such as Problems, Review Questions, Discussion Questions, and Test Banks offer students a second exposure to important sections of the chapter after their completion of a SmartBook 2.0 assignment.

During Class

The Teaching Guide offers a host of additional materials and experiential activities you can use to bring chapter content to life.

Guided Peer Instruction (GPI)

When using GPI, students do some basic preparation as homework—reading and tackling the easier problems at home—and then come to class to work out more difficult problems while you're there to guide them in their analysis. What we want them to do in class is to think beyond the basics in the textbook or in the lecture and learn to think critically and apply economic concepts.

In GPI:

- In-class questions are meant to be harder than the basic homework questions.
- We expect most students will get the questions wrong individually (30% – 50% correct).
- We expect most groups will get the questions right (75% – 85% correct).

Example question from biology:

> Think of a large oak tree. Where does most of the mass of the tree come from?
>
> A. The soil
>
> B. The water
>
> C. The atmosphere
>
> D. Sunlight

The answer is not at all obvious. But if you think long enough, you will perhaps realize that the correct answer is c, the atmosphere. That's because when the tree engages in photosynthesis, it uses sunlight to break up CO2 molecules from the atmosphere. The carbon from those CO2 molecules ends up forming the large majority of the mass of the tree.

However, the answer isn't necessarily important. From the pedagogical point of view, the point of this question is not to assess student understanding but to create it. It has a non-obvious answer that students can't get from just memorizing the book. The answer requires students to build on what they know and apply it. It makes them stretch from rote memorization to application and insight.

Other In-Class Activities

If your goal is content mastery and you are utilizing SmartBook 2.0, you can plan class activities and lectures based on results from the general results report and the metacognitive skills report. This allows for a more tailored class period that enhances student engagement and more opportunities to resolve gaps in knowledge.

If your goal is to jointly engage your students while applying content from the text, you can select a self-assessment follow-up activity (all follow-up activities are found in the Teaching Guide). These assets are especially useful if you are "flipping" your classroom, wherein the class session is used for application and analysis of key concepts rather than lecture.

After Class

After the face-to-face class session, or online lecture, you can assign Connect® exercises as homework to further reinforce the material covered in the textbook and lecture. You may also want to assign a "Connect the Dots" video if you notice that students are struggling with a particular topic, even after class. To further gauge student comprehension, you can also assign a quiz or exam. The test banks in Connect® focus more on defining and explaining material, and the test banks focus more on application and analysis.

Finally, if you are looking to have students think critically to solve real-world problems, then you may want to utilize an application-based activity after class. Application-based activities are mini-simulations that allow students to make decisions and see their impact immediately. There are both theory-based questions that have right and wrong answers, and there are also branching questions that allow students to make ideal, sub-ideal, and incorrect decisions based on the theory they've learned. A student's particular path in the activity will depend on the decisions made on the branching questions. as Because they do not introduce new material, application-based activities should be utilized after a student has had at least one pass at the chapter content. Rather, they encourage students to apply, analyze, and evaluate material they already understand.

LEARNING OBJECTIVES

1.1 Define economics and the features of the economic perspective.

1.2 Describe the role of economic theory in economics.

1.3 Distinguish microeconomics from macroeconomics and positive economics from normative economics.

1.4 Explain the individual's economizing problem and how trade-offs, opportunity costs, and attainable combinations can be illustrated with budget lines.

1.5 List the categories of scarce resources and delineate the nature of society's economizing problem.

1.6 Apply production possibilities analysis, increasing opportunity costs, and economic growth.

1.7 Explain how economic growth and international trade increase consumption possibilities.

1.8 (Appendix) Understand graphs, curves, and slopes as they relate to economics.

OVERVIEW OF CHAPTER 1

This chapter begins with a discussion of the meaning and importance of economics. In this first chapter, however, we will not plunge into problems and issues; instead we consider some important preliminaries. We first look at the economic perspective—how economists think about problems. Next, we examine the specific methods economists use to examine economic behavior and the economy, including distinguishing between macroeconomics and microeconomics. We then look at the economizing problem from both an individual and societal perspective. For the individual we develop the budget line, for society the production possibilities model. In our discussion of production possibilities, the concepts of opportunity costs and increasing opportunity costs, unemployment, growth, and present versus future possibilities are all demonstrated.

The appendix to Chapter 1 provides an important introduction to graphical analysis. While this will be review material for most students, for some this may be new. Instructors are strongly urged to confirm that their students understand this section before proceeding. The software supplement can provide effective remedial help for those students who are not familiar with graphical analysis, or just need a refresher.

COMMENTS AND TEACHING SUGGESTIONS

1. This chapter and related classroom activities will set the tone for the rest of the course. The methods used in the initial class meetings set the expectations and attitudes of the students. Making dramatic changes later can be confusing and the outcome less successful than desired. Please refer to the preface for detailed suggestions. If you plan to make current events an integral part of the class, consider offering educational subscriptions to *The Wall Street Journal*, or one of the weekly news or business publications such as *The Economist*.

2. On the level of personal decision-making, students might be asked to list all of the economic choices they had to make that day or that week. This impresses upon them that, as Alfred Marshall said in the 1890s, “economics is the study of man in the ordinary business of life.” To illustrate the rational basis of their decisions, students could analyze one or two of these choices in terms of the alternatives they gave up. What other choices did they have? What criteria were used to judge the alternatives? A discussion of how rational our decisions are might also follow, providing an opportunity to introduce problems such as imperfect information and short- versus long-term objectives.

3. There are many dimensions to the topic of “utility” that introductory students will benefit from contemplating. With these many dimensions comes the danger in taking students too deep too quickly. It is useful for students to understand that utility may be obtained both through material and nonmaterial means. Accordingly, it may be difficult to express how much one is willing to pay (or otherwise sacrifice) to obtain utility through a given activity.

When discussing rational behavior, and seemingly irrational decisions, is may be useful to point out that for some people their utility is interdependent. You can have a bit of fun telling students that economists define love as “strongly interdependent utility functions.” The main point, of course, is that there are many situations where people obtain utility through seeing others having material and nonmaterial wants satisfied. Likewise, some gain utility from watching others suffer, even if it means that they are themselves worse off in material terms.

If a question arises about the measurement of utility, the distinction between cardinal and ordinal utility can be made, but there is little to be gained from an elaborate discussion. Students may find it interesting that Jeremy Bentham (whom they meet in Origin of the Idea 1.2) envisioned some sort of “util-o-meter,” a contraption that one might strap to the head to record brain waves in an attempt to measure utility from an activity. Even suggesting that one might use “utils” as a measure of satisfaction often amuses students and helps them better recall this topic.

4. As the text suggests, it may be useful to discuss several noneconomic examples to illustrate the importance of models or simplification—for example, explaining that a road map is a model or simplification of the real world. The amount of detail on any road map would be determined by the needs of the traveler, i.e., "I need to travel between Chicago and Denver as quickly as possible," versus, "I would like to visit some historical museums as I am traveling through Nebraska." Neither road map would have the details of the real world. Devoting some time and effort to this point can help students see the importance of using economic models to represent the real world. You may wish to use the example below.

Concept Illustration – Abstractions and Models

> *"What do you consider the largest map that would be really useful?"*
>
> *"About six inches to the mile."*
>
> *"About six inches!" exclaimed Mein Herr. "We very soon got six yards to the mile. And then came the grandest idea of all! We actually made a map of the country on a scale of a mile to a mile!"*
>
> *"Have you used it much?" I enquired.*
>
> *"It has never been spread out yet," said Mein Herr. "The farmers objected. They said it would cover the whole country and shut out the sunlight!"*
>
> Lewis Carroll
> *Silvie and Bruno*, 1889

In many ways, good economic models are like good maps. Both are abstractions that purposely leave out irrelevant facts and circumstances. Both are useful and practical *because* they simplify complex realities.

Maps not only help us understand geographical relationships but also serve as useful tools. A road map of the United States, for instance, helps us understand where Connecticut is located relative to California. It also is highly practical in helping us drive between Indiana and Idaho.

In much the same way, economic models are helpful and useful. For example, a model indicating how consumers respond to a change in a product's price helps us understand a significant facet of human behavior. That model also is highly practical; among other things, it identifies the primary way a business can reduce an overstock of unsold goods.

The appropriate map or appropriate economic model is the simplest one that accomplishes a specific goal. Although we may need a highly detailed street map of Cleveland to find a specific residence there, we need only a general road map to drive between Cleveland and Columbus.

Similarly, we need a highly complex, detailed economic model to predict the economic effects of a general reduction of U.S. tariffs (taxes on imported goods) on the relative outputs of various U.S. industries. In contrast, a much simpler model will suffice to show how a reduced U.S. tariff on imported beef will affect the total consumption of beef in the United States.

You will discover many economic models in your study of economics. The trick is to use the right model for the right purpose. Think of these models as highly useful, highly practical "maps," which help us better understand elements of the highly complex economy.

5. Most students are all too familiar with the problem of scarcity. Although income and time are not resources in the way in which we define resources in economics, these are what are most scarce to students. Explain how making a budget is dealing with the problem of their limited financial resources and their virtually unlimited wants. Other examples can be how businesses choose between two products when allocating their limited resources and choose between two resources when allocating their limited revenues. Further discussion can bring in examples of allocating federal and/or state tax revenues, especially when state revenues compete with funding the state university.

6. To personalize the problem of opportunity cost, ask what else they could be doing during a specific economics class; what are their foregone alternatives? Why might it be more expensive for older students to attend the class than younger ones? Encourage students to find examples of opportunity cost in newspaper articles and magazines. Choice is a necessary part of life; every action has its costs and benefits. Identifying and quantifying these trade-offs is at the heart of economic analysis.

You may also want to use the following illustration to facilitate student understanding of opportunity cost.

Concept Illustration – Opportunity Cost

The concept of opportunity cost can be illustrated through the eyes of a small child. Suppose that a young girl named Amber receives a $30 gift certificate from her grandparents to be used at Toys4Me. The grandparents take the girl to the store, where she spots several toys she would like—all priced above $30. After gaining a sense of what is affordable, Amber narrows her focus to small stuffed animals ($10 each) and picture books ($5 each).

The grandparents tell Amber that she can buy three stuffed animals, six books, or some limited combinations of the two items. She initially settles on one stuffed animal at $10 and four picture books at $5 each. The grandparents assure her that this selection works; it will exactly use up the $30 certificate. Amber takes the goods to the checkout counter.

But while waiting to pay, she changes her mind. She decides she wants another stuffed animal because they are so cute. What should she do? The grandparents tell her to go pick out a second stuffed animal and then return two of her four books to the shelf. She

makes the exchange, ending up with two stuffed animals at $10 each and two picture books at $5 each.

From an adult's perspective, the second stuffed animal cost $10. But in the eyes of the child, *it cost two picture books*. To get the second stuffed animal, Amber had to give up two books. That sacrifice was the *opportunity cost* of her last-minute decision. Amber's way of looking at cost is one of the fundamental ideas in economics.

7. Current news articles can serve many purposes in a principles class. Most instructors assign a high priority to helping students apply the general principles of economics to the specific problems and decisions they make. Short essays, oral reports, class discussion and longer-term projects are all examples of how current news could be incorporated into the course. A term project focused on current issues such as health care, welfare reform, environmental problems, defense spending, or education can help students develop an appreciation of the problem of scarcity and the trade-offs that need to be considered when formulating public policy.

8. The problems of underdeveloped countries could also be used to illustrate the seriousness of choosing between capital goods and consumer goods. Focusing a project on the problems of a single developing country can be interesting. It would allow students to make many comparisons including the impact of differing economic systems, degree of government regulation, environmental quality standards, differences in resource availability, climate, educational levels, and the choice between consumer and capital goods.

STUDENT STUMBLING BLOCKS

1. Instructors cannot take for granted students' background knowledge of economics. Students generally have no idea about the magnitude of common economic measurements and, therefore, their reading of the news may be colored by this lack of knowledge. One teaching tip that has worked for others is to give students a pretest during the first week of class, in which simple questions are asked about the U.S. economy. For example, questions can be asked about the size of population and labor force, unemployment and inflation rates, GDP, federal budget, deficits and debt. You will find wildly different answers to these questions with most far away from "ball park" figures. This exercise accomplishes two things. First, it lets students know that they have a lot to learn about "everyday" news items. Second, the correct answers can give them some early perspective on news events as they relate to the course. As the course progresses, don't forget to reinforce these facts by reminding students of them.

2. The specialized definitions in economics sometimes frustrate students, especially when they are familiar with a term in a different context. You may wish to use the following example to help students appreciate that specialized definitions are common in our everyday lives.

Concept Illustration – Specialized Definitions

> *"Then you should say what you mean," the March Hare went on.*
>
> *"I do," Alice hastily replied; "at least I mean what I say—that's the same thing you know."*
>
> *"Not the same thing a bit!" said the Hatter.*
>
> *"Why, you might just as well say that 'I see what I eat' is the same thing as 'I eat what I see!'"*
>
> *Lewis Carroll,*
> *Alice in Wonderland, 1865*

In an indirect way, the specialized terms used in games such as soccer, baseball, bowling, and so forth provide insights on the study of economics. Consider the game of pool, for example. The following terms are used in pool but have slightly or totally different meanings in everyday language: "pool," "cue," " kiss," "bank," "bridge," "combination," "break," "lag," "run," "rack," "scratch," "chalk," and "rail." Economics, too, uses terms that have different meanings than in everyday usage. In economics "labor" usually means all productive effort, not simply blue-collar workers; "capital" means human-made productive resources, not money used to buy resources. Also, "investment" means spending to pay for production and accumulation of capital goods,

not purchases of stocks and bonds; “public good” means goods that have special characteristics, not the good of society; and so forth.

Learning to communicate in the game of pool (or any other game) requires learning the meaning of specialized terms. It’s the same with economics! It is not enough to “mean what you say,” in economics. To communicate effectively (and to do well on exams!) you must “say what you mean,” using the precise terms of the discipline.

3. Principles of economics students are often frustrated by the apparent lack of precision and definitive answers in the discipline. Economists establish a framework of rational decision-making based on maximizing utility, only to have that utility be immeasurable, or decision outcomes to be less than optimal because of imperfect information or seemingly irrational behavior. It is important to help students understand that, among other things, they are gaining more of an analytical toolkit than a set of hard and fast rules or immutable natural laws. To help students appreciate this, it is useful to appeal back to the road map illustration. Using a road map, one can find the shortest (and presumably fastest) route from one point to another. Even if someone has driven a route many times, there are factors such as traffic, weather, and road construction that may cause the otherwise quickest route to be less than ideal for that day’s travel. Maps, like economic models, are often effective at telling people what they need to know. They are, however, limited in their effectiveness by factors beyond view.

4. In the discussion of marginal analysis, students often bring up examples that include “sunk” costs. For example, if you ask students why they came to class, many will answer that they paid tuition and imply that they would somehow lose that money if they didn’t attend. If probed further, however, students will acknowledge that the college is unlikely to refund their money for any missed classes. That doesn’t mean there wouldn’t be future expenditures (paying tuition later to retake a failed class). It also doesn’t mean that there aren’t some psychological benefits to “getting what you paid for,” but many students will erroneously identify that tuition payment as a marginal cost of attending a given day of class. While your intention may be to discuss sunk costs in a later chapter, student questions and discussion may require you to be prepared to introduce the concept earlier.

5. The concept of “full employment” is potentially problematic, particularly for those courses that will eventually cover macroeconomics. The use of the term in this chapter refers to the use of all available resources, human and non-human. In macroeconomics the concept is used to describe general conditions in labor markets and the economy as a whole, but is usually focused on the economy’s use of its human resources. Even then it is recognized that under conditions of full employment there is unemployed labor. There is also the potential for confusion as the concept applies to the land resource. Fully employed deposits of coal or petroleum do not imply exhaustion of those resources. It is more a question of whether there is an adequate amount of these non-human resources available to sustain full employment in labor markets. A full discussion of this is probably not appropriate with students at this point, but you may find it useful to emphasize here that the concept is most often applied to the human resources. Then,

when the topic arises again in Chapter 26 (for those covering macroeconomics), students will be less likely to feel that you are changing definitions on them.

6. The production possibilities curve simplifies many concepts for students who don't have "graph anxiety." However, for those who are uncomfortable with graphs, this model may confuse rather than simplify. Computerized tutorials will be especially helpful for these students.

7. Some topics may elicit emotional and/or politically charged responses from students. While one must be sensitive, especially regarding those directly and negatively impacted by those events, it presents an opportunity to demonstrate how economists attempt to detach their emotional and political biases to achieve a more objective economic analysis. It is also an opportunity to point out that the usual role of the economist is to tell us what choices are available, not what choices should be made.

8. The instructor could treat the appendix on graphical analysis as a supplement for those students who have weak backgrounds in reading or constructing simple graphs. There is often a wide disparity among student abilities here. Instructors may wish to have a remedial session and special assignments for students deficient in graphing skills. Comparing graphs to maps seems to help students who have "graph anxiety." Instructors may also administer a math assessment on the basic math skills necessary to succeed in the course early in the course term.

LECTURE OUTLINE

As opposed to providing a traditional outline, the author team would like to direct instructors to the McConnell 22e PowerPoints to serve as chapter outlines. The chapter PowerPoints offer the most organized outline of the chapter and can be downloaded from the Instructor's Resource page in Connect. Instructors can use their connect username and password to access these resources.

QUIZ

The following questions are unique to this Teaching Guide and cannot be found in Connect. They are included for instructors who want to provide in-class quizzes or otherwise have some chapter-aligned content available outside of Connect. Many additional auto-graded problems can be found in Connect and can be sorted by difficulty, learning objective, and other criteria.

1. Economics is a social science concerned with:
   A. the best use of scarce resources to achieve the maximum satisfaction of economic wants.
   B. increasing the level of productive resources so there is a minimum level of income.
   C. increasing the level of productive resources so there is maximum output in society.
   D. the best use of scarce resources paid for at the minimum level of cost to consumers and businesses.

   Answer: A

2. A person should consume more of something when its marginal:
   A. benefit exceeds its marginal cost.
   B. cost exceeds its marginal benefit.
   C. cost equals its marginal benefit.
   D. benefit is still positive.

   Answer: A

3. The process of developing hypotheses, testing them against facts, and using the results to construct theories is called:
   A. Opportunity cost calculation
   B. Microeconomics
   C. Marginal analysis
   D. The scientific method

   Answer: D

4. Which is an illustration of a microeconomic question?
   A. What is the current national rate of unemployment?
   B. Is the economy experiencing a decline in the rate of inflation?
   C. Will a new type of television set increase the number of buyers?
   D. Is the production of goods and services in the economy greater this year than last year?

Answer: C

5. A schedule or curve that shows the various combinations of two products a consumer can purchase with a specific amount of money income is:
   A. A trade-off
   B. A budget line
   C. A tangent point
   D. An optimal output

   Answer: B

6. Which of the following is real capital?
   A. a pair of stockings
   B. a construction crane
   C. a savings account
   D. a share of IBM stock

   Answer: B

7. A point inside a production possibilities curve best illustrates:
   A. unemployment.
   B. the efficient use of resources.
   C. the use of best-available technology.
   D. unlimited wants.

   Answer: A

8. A normative statement is one that:
   A. is based on the law of averages.
   B. applies only to microeconomics.
   C. applies only to macroeconomics.
   D. is based on value judgments.

   Answer: D

9. The problems of aggregate inflation and unemployment are:
   A. major topics of macroeconomics.
   B. not relevant to the U.S. economy.
   C. major topics of microeconomics.
   D. peculiar to command economies.

   Answer: A

10. On a production possibilities curve, the single optimal or best combination of output for any society:
    A. Is at a point near the top of the curve
    B. Is at the precise midpoint of the curve
    C. Is at a point near the bottom of the curve
    D. Depends upon the preferences of society

    Answer: D

GUIDED PEER INSTRUCTION EXERCISES

The following are designed for use as in-class Guided Peer Instruction questions, outlined earlier in this document.

GPI Problem 1-1

Learning Objective 1-8

The makers of cell phones and other electronic devices include so many features that the average consumer only uses a few of them.

How do manufacturers decide which features to include?

A. By attempting to make their product stand out as much as possible
B. By trying to accommodate the diverse needs of various customers
C. By selecting only those features which generate positive net benefits (MB > MC) for consumers
D. By selecting only those features which generate positive net benefits (MB > MC) for themselves (the manufacturers)

The Correct Answer: "D – By selecting only those features which generate positive net benefits (MB > MC) for themselves (the manufacturers)"

For the manufacturer, the marginal benefit of producing a feature must outweigh the marginal cost or it will make a marginal loss (negative profit) on the feature. This is different than the decision-making process for the consumers, where they are only concerned about the benefits to themselves (Answer C) and should only select features or products where the marginal benefits outweigh THEIR marginal costs.

Discussion

It is useful to discuss that all of the answer choices ARE considerations in the market as a whole. Manufacturers definitely want their products to stand out and they want to meet as many customers' needs as possible to widen their market scope. Students generally have an understanding of what is important when running a business so this discussion is fairly easy to have.

Students also understand very well the consumer consideration that a feature needs to have a positive benefit for themselves or they won't buy it—they are after all consumers themselves. It's easy to show that C is incorrect because manufacturers could charge

$0 for the feature in which case the MB will almost certainly be positive for the consumer, but causes negative profits for the manufacturer.

One of the keys to getting the students to understand why Answers A and B are incorrect is to point out that companies would lose profits if they include a feature that costs them more than consumers are willing to pay for it.

Overall, this is an important discussion to get the students to think about all roles and considerations in a marketplace.

Incorrect Answers

- A & B. By attempting to make their product stand out as much as possible; By trying to accommodate the diverse needs of various customers. As stated above, manufacturers could achieve these goals but lose profits if the costs are higher than the consumers' willingness to pay.

- C. By selecting only those features which generate positive net benefits (MB > MC) for consumers. As stated above, this could result in negative marginal profits for the manufacturers.

GPI Problem 1-2

Learning Objective 1-7

On Monday morning, Janet takes a quiz one hour after having coffee and gets a decent grade. Then on Wednesday morning, she takes an equally hard quiz without drinking any coffee and gets a worse grade.

Can we conclude that drinking coffee helps Janet on quizzes?

A. Yes, because she did better when she drank coffee.
B. Yes, because it isn't just Janet—lots of people do better on coffee.
C. No, because Janet didn't run a proper experiment.
D. No, because we need more observations.

The Correct Answer: "C – No, because Janet didn't run a proper experiment"

The scenario violates the "all else equal" requirement in that a quiz on Monday morning is not the same as one on Wednesday morning.

Discussion

It's important to point out that there are many things that could be different. Perhaps her studying for the Monday quiz was better than for the Wednesday quiz since she had the weekend to study. Are the quizzes in the same subject, or different ones and is she equally competent in both subjects? Even if they were in the same subject, was one quiz objectively more difficult? There are many possible differences between the quiz on Monday and the quiz on Wednesday that could be the actual causes of the differences in Janet's grades. Ideally, she'd run a controlled experiment and isolate the effect of drinking coffee. However, as with many experiments in economics, this isn't necessarily possible in this case (she can't take the same quiz twice because she'd already know the content).

One of the most popular answers is D. Students have a general understanding that experiments need multiple observations to be conclusive. However, it's important to point out that D is really a subset of the correct choice, C. There are other considerations, as pointed out above.

You can also point out that in other subjects, it is possible to run the same experiment over and over. For example, one could calculate the acceleration of a falling object in a physics experiment by repeatedly dropping the same object from the same height (take your keys out and drop them from your outstretched arm a few times to make that point that this is a repeatable experiment).

Incorrect Answers

- A. Yes, because she did better when she drank coffee. This just assumes that the answer is correct.
- B. Yes, because it isn't just Janet—lots of people do better on coffee. Again, this assumes that the answer is correct without any supporting evidence. (How do we really know that lots of people do better on coffee?)
- D. No, because we need more observations. As stated above, this is just one aspect of running an experiment and as such is not the best answer.

GPI Problem 1-3

Learning Objective 1-6

Adrian says that interest rates on car loans are higher in France than in the United States. Robin says that interest rates should be set by governments to be equally low in all countries. Francis says that we should raise taxes on the rich to help the poor.

Which statements are a matter of fact rather than opinion?

A. Both Robin's and Francis'
B. Adrian's

C. Robin's
D. Adrian's and Francis'

The Correct Answer: "B – Adrian's"

The key word in Robin's and Francis' statements is *should*. This is a key indicator that the statement is an opinion, or normative statement, and reasonable people can disagree. Adrian's statement however can be objectively analyzed: We could go look up car loan rates in both countries and compare them.

Discussion

Students generally understand this one fairly quickly. It is still important to have the discussion though because they will run across many normative statements that people attempt to sell as positive statements. You can pull some examples from recent economic articles to drive the point home.

Also, there is a simple interactive way to get them to understand: State what the temperature is in the room (or guess if there isn't a thermostat with the current temperature). Ask students to raise their hands if they think it's too cold. Repeat for "just right" and "too hot". Then, tell everyone who doesn't agree with your assessment that they're wrong. This usually results in every student understanding that the current temperature statement is a positive one and everyone's opinion about the temperature is normative (and not wrong).

Incorrect Answers

- A, C, and D. These all contain people who made normative statements.

GPI Problem 1-4

Learning Objective 1-5

Joe prefers Blu-ray movies to books, but likes video games most of all. Suppose Blu-ray movies cost $25 each, books cost $20 each, and video games cost $100 each.

If Joe can only spend his money on Blu-ray movies, books, or video games, what is the "opportunity cost" to him of 1 video game? That is, how much of his next-best option does he have to give up in order to get 1 video game?

A. 5 books
B. 4 Blu-ray movies
C. 4 Blu-ray movies and 5 books
D. $25

The Correct Answer: "B – 4 Blu-ray Movies"

The opportunity cost of buying the video game is the next best thing he must give up. Since he prefers Blu-ray movies to books, then Blu-ray movies are the next best thing that he would do with his money if he didn't buy the video game. Since $100 would buy 4 Blu-ray movies, 4 Blu-ray movies is the opportunity cost of the video game.

Discussion

The discussion will likely center on what an opportunity cost is. Students usually struggle with the concept and how to apply it. It's usually helpful to break it into two stages.

Stage 1: Video games > Blu-ray movies > Books

Stage 2: Reinforce that opportunity cost is the *next best thing*. It helps to discuss the fact that these are mutually exclusive choices: He can't spend the same $100 over and over again. Therefore, if he spends $100 on video games, he can't spend that same $100 on something else. He could spend $100 on video games, Blu-ray movies, or books. Not all three. Therefore, if he buys a video game, that's $100 he can't spend on something else. What's the next best thing? Movies.

Incorrect Answers

- A. 5 books. Since Blu-ray movies are preferred to books, then if he didn't spend the $100 on a game, he'd spend it on the movies.
- C. 4 Blu-ray movies and 5 books. As stated above, the choices are mutually exclusive and therefore only one of them can be the opportunity cost.
- D. $25. This is the equivalent of one movie, but $100 buys more than one movie.

GPI Problem 1-5

Learning Objective 1-5

Of the four basic categories of economic resources or inputs, which is an example of the type that technologically advanced economies feature a large and ongoing accumulation (build up) of:

A. Space for new cities
B. Teachers
C. Tractors
D. Innovators

The Correct Answer: "C – Tractors"

The answer choices are land (A), labor (B), capital (C), and entrepreneurship (D). Technologically advanced economies accumulate capital.

Discussion

Students often get hung up on the specific examples instead of generalizing. Answer D (innovators) is often the one students choose if they don't choose C. It's important to point out a few things about the incorrect choices.

First, countries don't need land (A). They can always build up. Japan is a great example of an advanced economy that hasn't been accumulating land. Here you can also talk about acquisition of land as through conquering (colonialism, wars throughout time, etc.) and how that strategy would eventually reach a limit (at least as long as we confine ourselves to Earth). There's also landfill, which some countries do. But again, there's a limit.

Second, labor (B) can be replaced by capital. This is a fairly easy point to make: elevator operators, telephone switchboard operators, and soon (maybe) self-driving vehicles.

The point about innovators (entrepreneurship) is usually the most elusive for the students. Their experience is that technologically advanced economies have a lot of innovation. You can point out that the innovations they use every day came from innovators all over the world. The components in their mobile phones were developed in many different countries. Further, once the innovations are packaged together, they can be sold to anyone anywhere. To illustrate the point, you can bring up Vatican City, which uses a lot of advanced technology but produces none of its own (if using Vatican City is sensitive, pick your favorite country that is primarily a tourist destination). You could also bring up the example of the Industrial Revolution, which primarily began in Great Britain but spread across the world over time.

Incorrect Answers

As discussed above A, B, and D are incorrect. Also, you can point out that the answer is directly in the text book.

GPI Problem 1-6

Learning Objective 1-3

Tyrell is participating in a one-man Easter-egg hunt in which he's the only kid allowed to find Easter eggs in a large garden. Some eggs are in plain view while others are well hidden.

Which do you think will take more time and effort for Tyrell to gather (assume there are at least 61 eggs)?

A. His first 20 eggs
B. His second 20 eggs
C. His third 20 eggs
D. Any additional eggs

The Correct Answer: "D – Any additional eggs"

This problem illustrates the law of increasing opportunity costs. The eggs in plain view are easier to find and therefore Tyrell must give up very little time to find them. As the easiest eggs continue to be found, it takes more and more time to find the next eggs. Therefore, he has to continue to give up more time to find the last eggs than he did the first ones.

Discussion

There is usually a large discussion about how many eggs he has to find. Students are often unconvinced that the number of eggs doesn't matter (as long as there are more than 60). Students will sometimes give the right answer for the wrong reason. They will state that if there are, for example, 3000 eggs, then finding the last 2940 will clearly take longer than finding the first 60. While true, this misses the point of increasing opportunity costs.

The key is to ask them which eggs get found first and usually they will state that they'll find the ones that are in plain sight first. It's a small step then to get them to understand that the eggs remaining will be increasingly difficult to find. Sometimes students make an argument that they would try to find the hardest first, but this is generally just an attempt to argue they were correct and you can point out that Tyrell is an example of a generic person.

Incorrect Answers

- As discussed above A, B, and C are incorrect because the easiest will be found first.

GPI Problem 1-7

Learning Objective 1-2

For the United States, the opportunity cost of 1 good domestically produced car is 5,000 bushels of domestically produced wheat. By exporting 9,000 bushels of domestically

produced wheat to Japan, we can get in return 2 equally good Japanese cars via international trade.

Given those facts, the United States should be producing:

A. More cars and less wheat
B. Fewer cars and more wheat
C. More cars and more wheat
D. Fewer cars and less wheat

The Correct Answer: "B – Fewer cars and more wheat"

The United States must give up 5000 bushels to get 1 car. Japan only gives up 4500 bushels to get 1 car. Japan gives up less wheat to produce 1 car than the United States does—its opportunity cost of producing cars is *lower* than the U.S.'s opportunity cost of producing cars. Therefore, Japan has a comparative advantage in the production of cars and the U.S. has a comparative advantage in the production of wheat. Consequently, the U.S. should produce fewer cars and more wheat.

Discussion

It's important to walk through the math and to introduce the concept of keeping the units with the calculations. Write on the board:

U.S.: 5000 bushels/car

Japan: 4500 bushels/car

You can also point out they do this every day. Ask what the price of a coffee is at the cafeteria (or any other product at any store) and write it on the board too.

Coffee: $3.50

Then, rearrange it to look like the calculations above:

3.50 $/coffee

At this point, most students usually get it and calculating opportunity costs becomes must easier.

You can also use this framing:

Give up/to get

In the coffee example, you give up $ to get coffee.

Then it's a discussion of comparative advantage and its basis in opportunity cost. Since Japan gives up 4500 bushels to get one car, it has a lower opportunity cost than the US.

Therefore, it has the comparative advantage in the production of cars and should produce them (and the US should produce wheat).

Incorrect Answers

- The incorrect answers (A, C, and D) do not follow from comparative advantage.