

# CHAPTER 1

## What Economics Is About

Chapter 1 provides students with an overview of what economics is and of some of the key concepts in economics. It also introduces students to the market-versus-government debate over economic problems. There are two appendices to this chapter. Appendix A covers working with graphs—teaching the student how to read a graph, how to derive the slope of both a line and a curve, and introducing the student to bar graphs, pie charts, and line graphs. Appendix B discusses economics as a major and careers for economics majors.

### ■ KEY IDEAS

1. Economics is the science of scarcity.
2. Economists think in terms of key concepts.
3. The market-versus-government debate is an important one to know about, but it takes time to learn the particulars.
4. Economics is sometimes broken down into different categories.
5. [Appendix A] Economists work with diagrams.
6. [Appendix B] Economics can be a viable major.

### ■ CHAPTER OUTLINE

#### I. YOUR LIFE, 2016–2026

The study of economics is relevant to everyone's lives today and tomorrow. With the help of economics, one can find specific answers to questions such as "How much will one earn as salary after college?" "What is one's life going to be like during 2016-2026?" etc.

#### II. A DEFINITION OF ECONOMICS

##### A. Goods and Bads

Economists talk about goods (anything that gives a person utility) and bads (anything that gives a person disutility). People want goods and they do not want bads.

##### B. Resources

It takes resources to produce goods. Economists divide resources into four broad categories: land, labor, capital, and entrepreneurship.

##### C. Scarcity and a Definition of Economics

Scarcity is the condition where our wants are greater than the limited resources available to satisfy them. Scarcity is the basic economic problem confronting all

individuals and societies. For this reason, economics is defined as the science of how individuals and societies deal with the fact that wants are greater than the limited resources available to satisfy those wants.

#### **D. The Counterintuitive in Economics**

The economic and political institutions under which a country operates play a very important role in determining the outcomes that the country faces while dealing with scarcity. These institutions are different in various countries and it is the difference here that matters to poverty and wealth.

Scarcity affects everyone. Three effects of scarcity are (1) the need to make choices, (2) the need for a rationing device, and (3) competition. Competition occurs because of scarcity, and takes the form of people trying to get more of the rationing device.

### **III. KEY CONCEPTS IN ECONOMICS**

#### **A. Opportunity Cost**

The opportunity cost of anything is the most highly valued opportunity or alternative forfeited when a choice is made. Opportunity costs are incurred whenever choices are made because the resources used for those choices could have been used in other ways.

#### **B. Opportunity Cost and Behavior**

The higher the opportunity cost of doing something, the less likely it will be done.

#### **C. Benefits and Costs**

Economists are careful to think in terms of both costs and benefits.

#### **D. Decisions Made at the Margin**

Decision making at the margin is characterized by weighing additional (marginal) benefits of a change against the additional (marginal) costs of a change with respect to current conditions.

#### **E. Efficiency**

The right amount of anything is the optimal or efficient amount: the amount for which the marginal benefits equal the marginal costs. Net benefits are maximized when efficiency is achieved.

#### **F. Economics is About Incentives**

An incentive is something that encourages or motivates a person to undertake an action. Individuals have an incentive to undertake actions for which the benefits are greater than the costs or, stated differently, for which they expect to receive net benefits (benefits greater than costs).

**G. Unintended Effects**

Economists try to look at the unintended effects of an action.

**H. Exchange**

Exchange or trade is the process of giving up one thing for something else. People enter into exchanges in order to make themselves better off.

**IV. THE MARKET AND GOVERNMENT**

When it comes to economic problems, the national debate usually proceeds along these lines: first, the problem is identified and defined or described, second, individuals attempt to identify the cause of the problem, and third, individuals propose solutions to the problem. Most of the debate focuses on the cause(s) of the problem and the proposed solutions. With respect to both the cause and the solution, we often hear two words mentioned: the “market” and “government.” The market-versus-government debate is an important one to know about, but it takes time to learn the particulars. Much of this book will help you learn those particulars.

**V. CETERIS PARIBUS AND THEORY****B. Ceteris Paribus Thinking**

*Ceteris paribus* means “all other things held constant” or “nothing else changes.” Invoking this assumption allows us to clearly designate what we believe is the correct relationship between two variables.

**B. What is a Theory?**

Economists build theories to answer questions that do not have obvious answers. To an economist, a theory is an abstract representation of the world. When they build a theory they leave out certain things and focus on the major factors or variables that they believe will explain the phenomenon they are trying to understand. *A theory emphasizes only the variables that the theorist believes are the main or critical ones that explain an activity or event.*

**VI. ECONOMIC CATEGORIES****A. Positive and Normative Economics**

Positive economics addresses what is, while normative economics attempts to determine what should be. This book mainly deals with positive economics.

**B. Microeconomics and Macroeconomics**

Microeconomics is the study of human behavior and choices as they relate to relatively small units, such as an individual, a firm, an industry, or a single market. Macroeconomics is the study of human behavior and choices as they relate to an entire economy.

## VII. APPENDIX A: WORKING WITH DIAGRAMS

A two variable diagram represents a relationship between two variables. Variables may be directly related (when one changes, the other changes in the same way) or inversely related (when one changes, the other changes in the opposite way). Variables can also be independent of each other. This condition exists if as one variable changes, the other does not.

### A. Slope of a Line

The slope of a line is the ratio of the change in the variable on the vertical axis to the change in the variable on the horizontal axis, and is used to learn how much one variable changes as the other variable changes.

### B. The Slope of a Line is Constant

The slope between any two points on a straight line is always the same as the slope between any other two points on that line.

### C. Slope of a Curve

The slope of a curved line at any given point is equal to the slope of a straight line tangent to the curve at that point.

### D. The 45-Degree Line

The 45-degree line is a straight line that bisects the right angle formed by the intersection of the vertical and horizontal axes.

### E. Pie Charts

Pie charts are used to demonstrate how the parts of a whole are distributed.

### F. Bar Graphs

Bar graphs are used to convey relative relationships.

### G. Line Graphs

Line graphs are useful for illustrating changes in a variable over some time period, but convey different messages depending on the measurement scale used. Sometimes two line graphs are shown on the same axes to draw attention to the relationship or the difference between the two variables.

## VIII. APPENDIX B: SHOULD YOU MAJOR IN ECONOMICS?

Students often consider the dollars at the end of the college degree. When choosing a major, students often consider 1) how much they enjoy studying a particular subject, 2) what they would like to see themselves doing in the future, and 3) what their income prospects are.

### **A. Five Myths about Economics and Being an Economics Major**

Some things that people think about an economics major and about a career in economics are not true. The five myths about economics are:

Myth 1: Economics Is All Mathematics and Statistics.

Myth 2: Economics Is Only About Inflation, Interest Rates, Unemployment, and Other Such Things.

Myth 3: People Become Economists Only If They Want to “Make Money.”

Myth 4: Economics Wasn’t Very Interesting in High School, So It’s Not Going to Be Very Interesting in College.

Myth 5: An Economics Degree Is a Lot Like a Business Degree, But a Business Degree Is More Marketable.

### **B. What Awaits You as an Economics Major?**

Economics majors learn quantitative skills, writing skills, and thinking skills.

### **C. What Do Economists Do?**

Economists work in many varied fields and do a myriad of things.

## **■ TEACHING ADVICE**

1. Go to [http://www.brillig.com/debt\\_clock/](http://www.brillig.com/debt_clock/) to see a clock that purports to show how much debt the U.S. government has outstanding. Compare this figure with the one found at the U.S. Treasury’s website at [www.treasurydirect.gov/NP/BPDLogin?application=np](http://www.treasurydirect.gov/NP/BPDLogin?application=np). Use this as a springboard for discussing positive economic statements such as “the figure shown here is accurate” and “the figure shown here is inaccurate,” versus normative economic statements such as “the federal debt is growing too rapidly” and “the federal debt is too large.”
2. Have students consider scarcity in the context of the Deepwater Horizon Oil Spill. Discuss the use of rationing devices to decide which beaches to clean first.
3. The Arnold text website at [www.cengage.com/economics/arnold](http://www.cengage.com/economics/arnold) presents teaching resources and on-line quizzes that your students can take (the results can be e-mailed to you), and a variety of other topical material.
4. The National Association of Business Economists has a Business Economics Career Center, available online at <http://www.nabe.com/Careers/index> which provides useful information for students interested in majoring in economics.

## ■ ASSIGNMENTS FOR MASTERING KEY IDEAS

### Assignment 1.1

Key Idea: Economics is the science of scarcity.

1. Define economics.
2. Define scarcity.
3. List three effects of scarcity.
4. Define utility and disutility.
5. State how economists divide resources.
6. State the function of a rationing device and give an example.
7. Explain why competition exists.

### Assignment 1.2

Key Idea: Economists think in terms of key concepts.

1. List the concepts that economists think in terms of.
2. Define opportunity cost.
3. Use the concept of opportunity cost to explain why some things are not done.
4. Explain why economists consider costs and benefits, instead of only benefits.
5. Give an example from your life where you have considered both costs and benefits.
6. Explain why it is important to consider unintended effects.

### Assignment 1.3

Key Idea: The market-versus-government debate is an important one to know about, but it takes time to learn the particulars.

1. When it comes to economic problems, how does the national debate usually proceed?
2. Explain why economists use the *ceteris paribus* assumption.

### Assignment 1.4

Key Idea: Economics is sometimes broken down into different categories.

1. Define positive and normative economics.
2. Write your own example of a positive economic statement.
3. Write your own example of a normative economic statement.
4. Define microeconomics and macroeconomics.
5. Categorize the following as microeconomic or macroeconomic questions:
  - a. What are the differences between the dairy industry and the airline industry?
  - b. Why are unemployment rates for teenagers rising?
  - c. Why are prices falling in the digital camera industry?
  - d. Why is the U.S. experiencing low rates of inflation?
  - e. How large is McDonald's share of the fast food industry?
  - f. How will minimum wage rate changes affect your 17 year old brother's budget?
  - g. Why are interest rates rising?
  - h. How will the elimination of the capital gains tax affect the level of investment in the US economy?
  - i. Why are economic growth rates different in the U.S. and China?

### Assignment 1.5

Key Idea: Economists work with diagrams.

1. Explain what it means for two variables to be directly related, inversely related, or independent.
2. Explain what the slope of a line is used to show.
3. Compare the slope of a straight line with the slope of a curve.

4. List some of the types of charts and graphs that economists use.

### Assignment 1.6

Key Idea: Economics can be a viable major.

1. Describe five myths about economics and an economics major.
2. List the skills that economic majors learn.
3. List a few of the things that economists do.

## ■ ANSWERS TO ASSIGNMENTS FOR MASTERING KEY IDEAS

### Assignment 1.1 Answers

1. Economics is the science of how individuals and societies deal with the fact that wants are greater than the limited resources available to satisfy those wants.
2. Scarcity is the condition where our wants are greater than the limited resources available to satisfy them.
3. Three effects of scarcity are (1) the need to make choices, (2) the need for a rationing device, and (3) competition.
4. Utility is the satisfaction received from a good. Disutility is the dissatisfaction received from a bad.
5. Economists divide resources into four broad categories: land, labor, capital, and entrepreneurship.
6. Rationing devices are used to decide who gets a good. Examples vary.
7. Competition exists because of scarcity—there aren't enough resources to satisfy our wants.

### Assignment 1.2 Answers

1. Economists think in terms of opportunity cost and behavior, benefits and costs, decisions made at the margin, efficiency, incentives, unintended effects, and exchange.
2. Opportunity cost is the most highly valued opportunity or an alternative forfeited when a choice is made.
3. The higher the opportunity cost of something is, the less likely it is to be done.
4. Economists consider costs and benefits, instead of only benefits, in order to make better choices.
5. Answers will vary.
6. It is important to consider unintended effects since knowing about unintended effects leads to better decisions.

### Assignment 1.3 Answers

1. First, the problem is identified and defined or described. Second, individuals attempt to identify the cause of the problem. Third, individuals propose solutions to the problem.
2. Economists use the *ceteris paribus* assumption to clearly designate what they believe is the correct relationship between two variables.

### Assignment 1.4 Answers

1. Positive economics addresses what is, while normative economics attempts to determine what should be.
2. Answers will vary.
3. Answers will vary.

4. Microeconomics is the study of human behavior and choices as they relate to relatively small units, such as an individual, a firm, an industry, or a single market. Macroeconomics is the study of human behavior and choices as they relate to an entire economy.
5.
  - a. Microeconomics
  - b. Macroeconomics
  - c. Microeconomics
  - d. Macroeconomics
  - e. Microeconomics
  - f. Microeconomics
  - g. Macroeconomics
  - h. Macroeconomics
  - i. Macroeconomics

### Assignment 1.5 Answers

1. Two variables are directly related if they change in the same way, are inversely related if they change in opposite ways, and are independent if one changes and the other one does not.
2. The slope of a line is used to show how much one variable changes as the other variable changes.
3. The slope of a straight line is constant, while the slope of a curve varies from one point to another.
4. Economists use pie charts, bar graphs, and line graphs.

### Assignment 1.6 Answers

1. Myths about economics include that it is all mathematics and statistics, that it is only about inflation, interest rates, unemployment and other such things, that people become economists only if they want to make money, that economics isn't very interesting, and that an economics degree is a lot like a business degree, only less marketable.
2. Economics majors learn many of the skills that employers highly value: quantitative skills, writing skills, and thinking skills.
3. Answers will vary.

## ■ ANSWERS TO VIDEO QUESTIONS AND PROBLEMS

1. **There are 30 students in an Economics class. Is the opportunity cost of attending the class the same for each of the 30 students? Why or why not.**

It is very unlikely that the opportunity costs will be the same for all the 30 students. Opportunity cost is the most highly valued opportunity or an alternative forfeited when a choice is made. The alternative forfeited by one student may not be the same as the opportunity forfeited by another student. By attending an economics class, one student may be giving up reading a novel and another may be giving up working at a part-time job. So, the opportunity will not be the same for all 30 students.

2. **Scarcity is the condition in which peoples' wants (for goods and services) are unlimited or infinite. Do you agree or disagree? Explain your answer.**

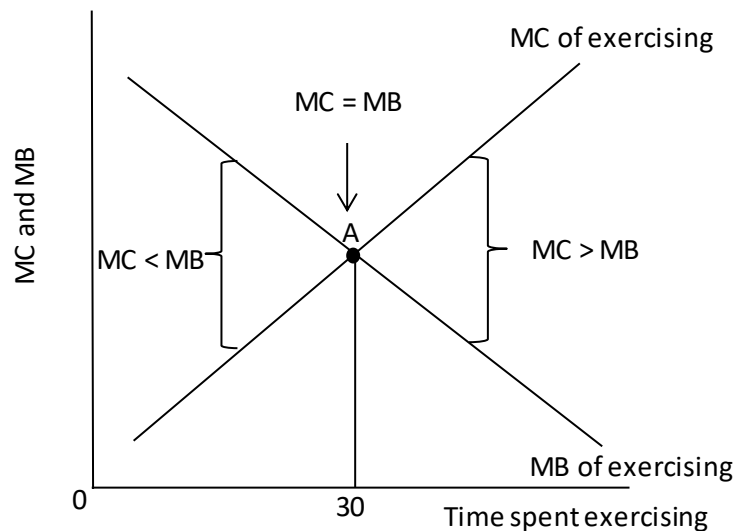


Scarcity is the condition in which peoples' wants are greater than the limited resources available to satisfy them. It implies that the wants are unlimited or infinite in relation to the limited resources available.

**3. Explain what it means to make a decision at the margin.**

Marginal benefits and costs are not the same as total benefits and costs. When deciding whether to eat some more food, an individual would not consider the total benefits and total costs of eating food. Instead, the person would compare only the marginal benefits (additional benefits) of eating some more to the marginal costs (additional costs) of eating some more.

**4. Can a person exercise “too much”? Explain your answer.**



In the above figure, MB refers to the marginal benefits of exercising and MC refers to the marginal costs of exercising. The MB curve is downward sloping and the MC curve is upward sloping. As long as  $MB > MC$ , the person will exercise. The efficient amount of exercise when  $MB = MC$ , at 30 hours. If the person exercises when  $MC > MB$ , then he/she will be exercising too much.

**5. All theories are abstractions from reality. What does this mean?**

A theory emphasizes only the variables that the theorist believes are the main or critical ones that explain an activity or event. All theories are abstractions from reality. But it doesn't follow that (abstract) theories cannot explain reality. The objective in theory building is to ignore the variables that are essentially irrelevant to the case at hand, making it easier to isolate the important variables that an untrained observer would probably miss.

## ■ ANSWERS TO CHAPTER QUESTIONS AND PROBLEMS

**1. The United States is considered a rich country because Americans can choose from an abundance of goods and services. How can there be scarcity in a land of abundance?**

Abundance does not imply unlimited resources. No one has unlimited money and time, so everyone must constantly make choices. This is the fundamental basis of scarcity. Even in a land of abundance, wants exceed the resources available to meet those wants.

**2. Give two examples for each of the following: (a) an intangible good, (b) a tangible good, (c) a bad.**

Answers will vary.

- (a) Intangible goods are those that have no concrete existence, such as friendship or an economics lecture.
- (b) Tangible goods are concrete goods that can be exchanged and reproduced more easily than intangible goods, such as a videotape of an economics lecture or a cell phone.
- (c) Bads are goods that provide disutility. Examples are pollution, the noise produced by planes taking off at an airport, or the smell a skunk produces etc.

**3. Give an example of something that is a good for one person and a bad for another person.**

Answers will vary. The example in the textbook is smoking a cigarette.

**4. What do economists mean when they say that “institutions matter”?**

The wealth of a nation strictly depends on the quality and efficiency of economic and political institutions under which the nation operates. These institutions determine the outcomes of production and growth processes. Scarcity exists everywhere. But the way a country deals with it is important to shape its prosperity, and that is where the “institutions matter”.

**5. What is the difference between the resource labor and the resource entrepreneurship?**

Labor consists of the physical and mental talents people contribute to the existing production process, while entrepreneurship refers to creatively seeking new business opportunities and new ways to organize production, and developing new ways of doing things.

**6. Can either scarcity or one of the effects of scarcity be found in a car dealership? Explain your answer.**

Answers will vary. One example is that the resources used to produce a car sold in the dealership could have been used to produce a different good.

**7. Explain the link between scarcity and each of the following: (a) choice, (b) opportunity cost, (c) the need for a rationing device, (d) competition.**

- (a) Because there is scarcity, individuals have to choose between the different goods that they have the opportunity to consume.
- (b) In choosing between different goods, individuals face an opportunity cost. When they decide to choose one good (go to a baseball game), they give up the opportunity to consume another good (see a movie).
- (c) Because wants exceed resources, some method for allocating scarce resources is necessary. Although there are many rationing devices, the most common one used in

economic transactions is the price mechanism, which defines how much of one resource (money) an individual must give up in order to obtain another resource.

- (d) Because resources are limited, people compete with one another both to obtain the resources they need to purchase the limited resources, and to get the resources that are available. This process is called competition.

**8. Is it possible for a person to incur an opportunity cost without spending any money? Explain.**

Yes. An opportunity cost occurs when an individual gives up any resource when making a choice. An example would be leisure time. When students study for an exam, the opportunity cost is the time they could have spent watching a movie or listening to a Sheryl Crow CD. Of course, not studying for the exam could also have an opportunity cost—flunking the course.

**9. Discuss the opportunity costs of attending college for four years. Is college more or less costly than you thought it was? Explain.**

Answers will vary. Students should include the cost of tuition, fees, and supplies that they purchase only because they are enrolled in college. They should also include that portion of room and board that they would not have spent had they not matriculated, remembering that, had they not enrolled in college, they would still have to eat and sleep somewhere. Finally, they should consider the opportunity cost of the time they spend in college. For example, suppose that Suzie has the following choices: she can go to college for the year, she can spend the entire year relaxing in leisure, she can take a job paying \$25,000 a year as a legal secretary for a hometown law firm, or she can take a job with the Peace Corps in Africa, earning \$17,000. If she decides that the best alternative use of her time would be to take a job paying \$25,000 a year as a legal secretary, the opportunity cost of going to college will include the \$25,000 that Susie foregoes. Once students include their opportunity costs, they find that college is considerable more expensive than they thought it was when they only considered out-of-pocket expenses.

**10. Explain the relationship between changes in opportunity costs and changes in behavior.**

To the extent that opportunity costs determine behavior by identifying those activities and goods that are “worth” making “sacrifices” for and those that aren’t, as opportunity costs change so will a rational consumer’s assessment of various options. For example, suppose that Becky, a high school graduate, is currently working as a model and is earning \$25,000 per year. In order to go to college she would have to cut back on her modeling, reducing her annual income to \$10,000. Further, suppose that tuition, books, and fees at the college of Becky’s choice total \$15,000 per year. In deciding whether to quit modeling full-time and go to college, Becky is faced with balancing a present opportunity cost of \$30,000, *ceteris paribus*, against the future benefits of a college education. Now, suppose that Becky earns a scholarship that will reduce her tuition, books, and fees bill to \$5,000 per year, thus reducing her present opportunity cost to \$20,000. While this may not change Becky’s mind (she may have already decided to accept the present burden for the future benefit), such a change in opportunity cost would certainly weigh in favor of going to college.

**11. Smith says that we should eliminate all pollution in the world. Jones disagrees. Who is more likely to be an economist, Smith or Jones? Explain your answer.**

Jones is more likely to be the economist. Smith is advocating the elimination of pollution by only considering the obvious benefits and not considering the serious costs of eliminating all pollution (such as costs incurred from finding an alternative to fossil fuels). Jones probably determined that the costs of eliminating all pollution are higher than the benefits from eliminating it.

**12. A friend pays for your lunch. Is this an example of a “free lunch”? Why or why not?**

This is not an example of a free lunch, since your friend could have bought something else with the money she used to buy your lunch.

**13. A layperson says that a proposed government project simply costs too much and therefore shouldn't be undertaken. How might an economist's evaluation be different?**

The layperson may only be looking at the cost of the project and not considering the benefits. An economist would consider both the marginal costs and the marginal benefits of the project. For example, the interstate highway system in the United States has cost a lot of money, but it has also provided a lot of benefits. Consequently, the United States has introduced an interstate highway system because the benefits of the system exceed the costs. On the other hand, the Apollo project that sent men to the Moon was suspended after a handful of flights because many people perceived that the marginal costs of sending men to the Moon was exceeding the marginal benefits. The individual may also be making a proper economic evaluation. The project might create large benefits to society, but none to that person. So while most people might see benefits exceeding costs, to some there are only costs and no benefits.

**14. Economists say that individuals make decisions at the margin. What does this mean?**

When economists say that individuals make decisions at the margin, they are referring to the fact that individuals consider the additional (marginal) benefits of their actions and the additional (marginal) costs of their actions. If the marginal benefits exceed the marginal costs, they proceed with the action. If the marginal costs are greater than the marginal benefits, then they do not carry out the action. For example, we decide whether or not to eat another piece of pizza by comparing the benefits and costs of that piece, not the benefits and costs of all the pieces we have already eaten.

**15. How would an economist define the efficient amount of time spent playing tennis?**

Economists state that efficiency occurs when the marginal benefits (MB) of an activity equal the marginal costs (MC) of that activity. The efficient level of time spent playing tennis would exist where the MB of playing tennis equals the MC of playing tennis.

**16. Ivan stops studying before the point at which his marginal benefits of studying equal his marginal costs. Is Ivan forfeiting any net benefits? Explain your answer.**

Ivan is forfeiting net benefits because net benefits are maximized when marginal benefits equal marginal costs.

**17. What does an economist mean if she says that there are no \$10 bills on the sidewalk?**

She means that people try to maximize their net benefits.

- 18. A change in X will lead to a change in Y; the predicted change is desirable, so we should change X. Do you agree or disagree? Explain.**

Assuming that the relationship between X and Y had been accurately measured, and that the relationship did not change, then the change in X would be desirable; however, several caveats should be recognized. First, the relationship could have been misspecified. Important factors that also influence Y, perhaps more strongly than X, could have been ignored in the analysis. It might be more efficient to change these other factors rather than X. Some logical explanation of why the relationship between X and Y occurs should be developed before proceeding. Second, the relationship between X and Y can change over time. You don't want to commit the fallacy of confusing correlation with causation. You can reduce the probability of this error by developing a logical explanation of why X will lead to a change in Y.

- 19. Why do people enter into exchanges?**

People enter into exchanges in order to make themselves better off.

- 20. When two individuals enter into an exchange, you can be sure that one person benefits and that the other person loses. Do you agree or disagree with this statement? Explain your answer.**

Disagree. The two individuals would not have voluntarily entered into the exchange if they did not both expect to benefit from it.

- 21. What is the difference between positive economics and normative economics? Between microeconomics and macroeconomics?**

Positive economics addresses what is, while normative economics attempts to determine what should be. Microeconomics is the study of human behavior and choices as they relate to relatively small units, such as an individual or a firm, while macroeconomics is the study of human behavior and choices as they relate to an entire economy.

- 22. Would there be a need for a rationing device if scarcity did not exist? Explain your answer.**

A rationing device is a means for deciding who gets what; therefore, if there were enough resources and goods for everyone, there would not be a need for a rationing device.

- 23. Jackie's alarm clock buzzes. She reaches over to the small table next to her bed and turns it off. As she pulls the covers back up, Jackie thinks about her 8:30 American history class. Should she go to the class today or sleep a little longer? She worked late last night and really hasn't had enough sleep. Besides, she's fairly sure her professor will be discussing a subject she already knows well. Maybe it would be okay to miss class today. Is Jackie more likely to miss some classes than she is to miss other classes? What determines which classes Jackie will attend and which classes she won't?**

Jackie should sleep a little longer. Jackie is more likely to miss some classes than she is to miss other classes since the cost of missing class is higher on some days. Jackie will decide which classes to attend by comparing the benefit from attending with the cost of attending.

- 24. If you found \$10 bills on the sidewalk regularly, we might conclude that individuals don't try to maximize net benefits. Do you agree or disagree with this statement? Explain your answer.**

Disagree. We would conclude that the cost of picking up a \$10 bill exceeds the benefit from picking up a \$10 bill.

- 25. The person who smokes cigarettes cannot possibly be thinking in terms of costs and benefits because it has been proven that cigarette smoking increases one's chances of getting lung cancer. Do you agree or disagree with the part of the statement that reads "the person who smokes cigarettes cannot possibly be thinking in terms of costs and benefits"? Explain your answer.**

Disagree. The person who smokes has decided that the benefits outweigh the costs of smoking (including the chances of getting lung cancer).

- 26. Janice decides to go out on a date with Kyle instead of Robert. Do you think Janice is using some kind of "rationing device" to decide who she dates? If so, what might that rationing device be?**

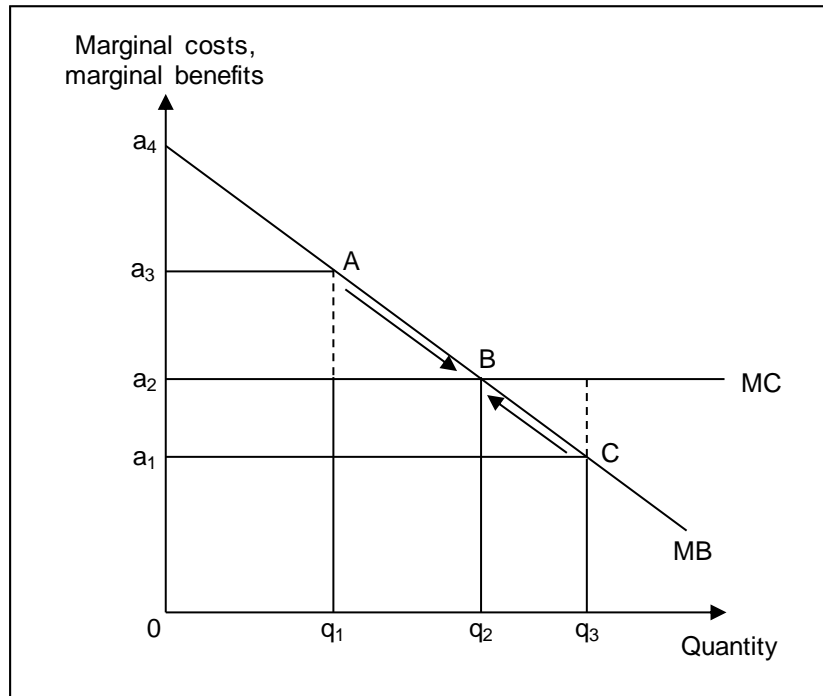
Assuming that Janice does not have time to date them both, she must decide which man gets the pleasure of her company. In this case she would use a rationing device to decide who gets the date. Depending on her preferences, this rationing device may be their intelligence, their looks, their earning potential, or their ability to make her laugh.

- 27. A theory is an abstraction from reality. What does this mean?**

This means that certain things are left out in order to focus on the main variables that will explain an activity or event.

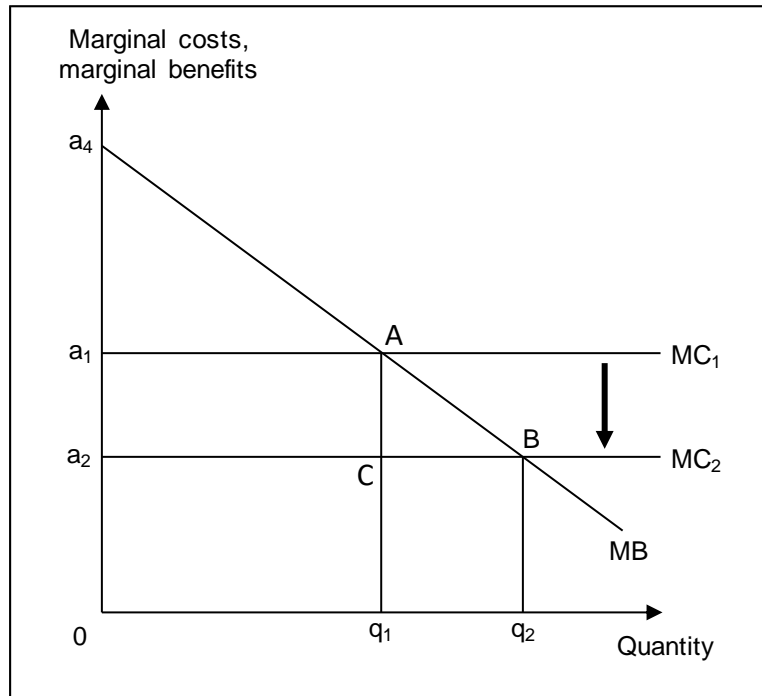
## ■ ANSWERS TO PROBLEMS IN THE WORKING WITH NUMBERS AND GRAPHS SECTION

- 1. Suppose the marginal costs of reading are constant and the marginal benefits of reading decline (over time). Initially, the marginal benefits of reading are greater than the marginal costs. Draw the marginal benefit curve and marginal cost curve of reading and identify the efficient amount of reading. Next, explain why the efficient point is the point at which the net benefits of reading are maximized.**



In the graph shown above, the vertical axis measures the marginal costs and benefits of reading, while the horizontal axis measures quantity, i.e., the time spent on reading. The horizontal MC curve shows the constant marginal cost of reading. The downward sloping marginal benefit (MB) curve shows that the marginal benefit of reading declines over time. Initially, at point A, the marginal benefits of reading are greater than the marginal costs;  $MB > MC$ . So, there are net benefits from reading further. In the figure, the marginal benefits of studying equal the marginal costs at  $q_2$ , which is the efficient length of time to read in this situation. If the time spent on reading is more than  $q_2$ , the marginal costs of reading are greater than the marginal benefits, and therefore reading beyond  $q_2$  is not worthwhile. At  $q_2$ , net benefits are maximized. In short, efficiency, which is consistent with  $MB = MC$ , is also consistent with maximizing net benefits.

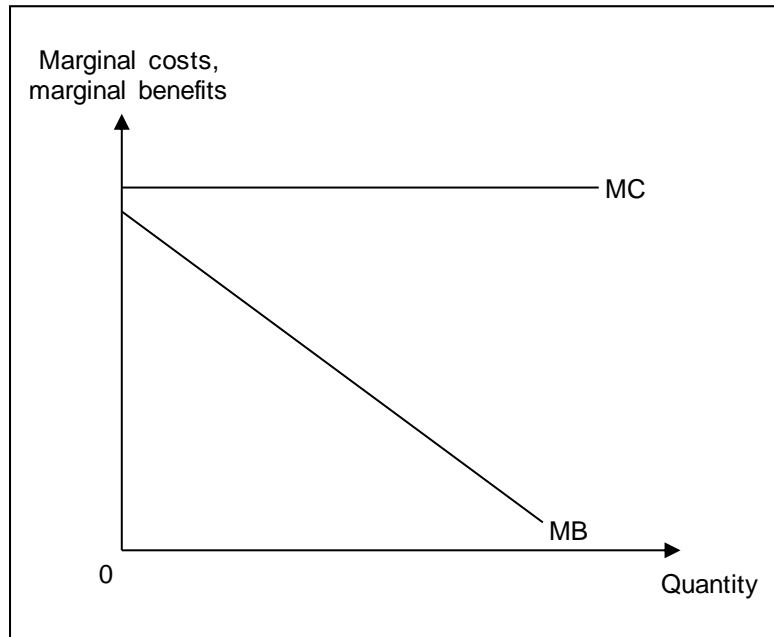
**2. Using the diagram you drew in question 1, lower the marginal costs of reading and identify the new efficient amount of reading. Also, identify the additional net benefits derived as a result of the lower marginal cost of reading.**



With a lower cost of reading, the marginal cost curve shifts downward from  $MC_1$  to  $MC_2$ . The new marginal cost curve intersects the marginal benefit (MB) curve at B. At point B, net benefit is maximized. The total net benefit derived at point A (at the higher cost of reading) is represented by the area of  $\Delta Aa_4a_1$  and the total net benefit derived at point B (at the lower cost of reading) is represented by  $\Delta Ba_4a_2$ . So, the additional benefits derived as a result of the lower marginal cost of reading = the area given by  $(\Delta Ba_4a_2 - \Delta Aa_4a_1) =$  area of the trapezium  $BAa_1a_2$ .

**3. Jim could undertake activity X, but chooses not to. Draw the marginal benefit and cost curves for activity X from Jim's perspective.**





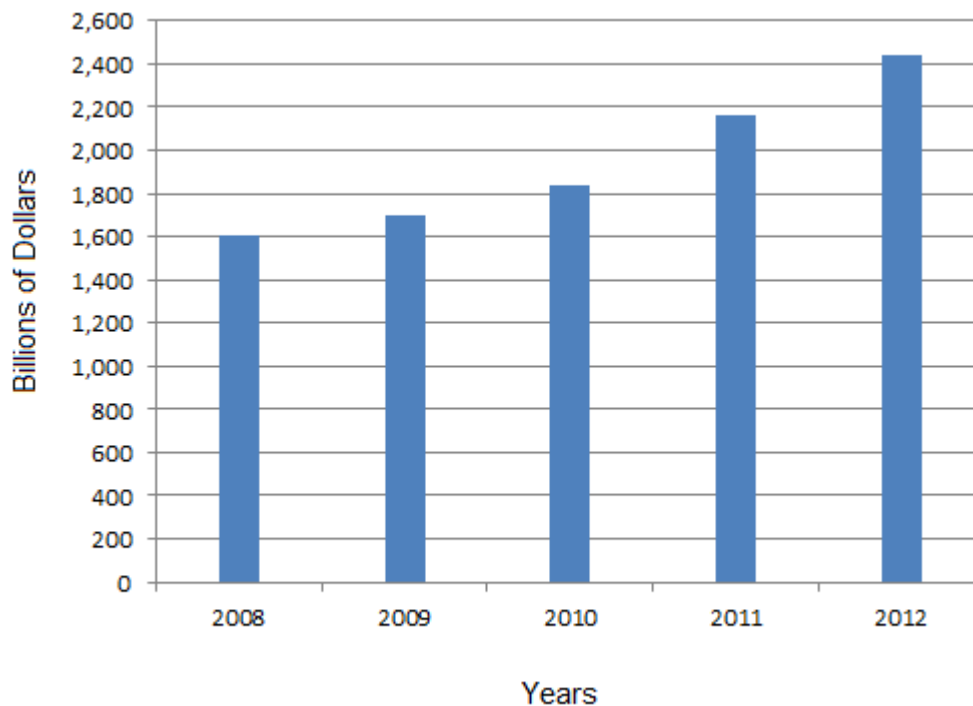
If Jim could undertake activity X but chose not to, this means that the marginal cost of undertaking a unit of activity X is higher than the marginal benefit. From Jim's perspective, the marginal cost curve will always lie above the marginal benefit curve for all units of activity X.

## ■ ANSWERS TO APPENDIX A QUESTIONS

1. For each of the following, what type of relationship would you expect between the variables? (a) Sales of hot dogs and sales of hot dog buns (b) The price of winter coats and sales of winter coats (c) The price of personal computers and the production of personal computers (d) Sales of toothbrushes and sales of cat food (e) The number of children in a family and the number of toys in a family
  - (a) Hot dogs and hot dog buns are complementary goods, a concept discussed in Chapter 3. One would expect the quantity of hot dog buns to be directly related to the quantity of hot dogs, *ceteris paribus*.
  - (b) Quantity demanded is inversely related to price, another concept from Chapter 3. One would expect the quantity of winter coats sold to be inversely related to the price of winter coats, *ceteris paribus*.
  - (c) Quantity supplied is positively related to price, again from Chapter 3. One would expect the production of personal computers to be directly related to the price of personal computers, *ceteris paribus*.
  - (d) One would expect sales of cat food to be independent of sales of toothbrushes since they are unrelated goods.
  - (e) *Ceteris paribus*, one would expect that the more children in a family, the more toys—that is, the two should be directly related.
2. Represent the following data in bar graph form:

Year	U.S. Money Supply (billions of dollars)
2008	1,604
2009	1,695
2010	1,836
2011	2,160
2012	2,440

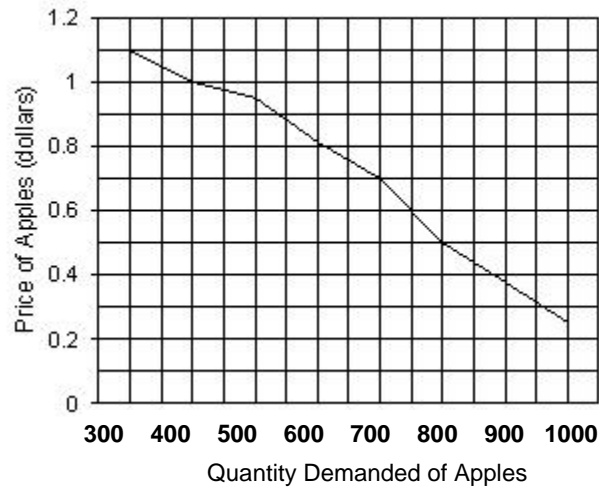
**U.S. Money Supply**



3. Plot the following data and specify the type of relationship between the two variables. (Place “Price” on the vertical axis and “Quantity Demanded” on the horizontal axis.)

Price of Apples (\$)	Quantity Demanded of Apples
0.25	1,000
0.50	800
0.70	700
0.95	500
1.00	400
1.10	350

The two variables are inversely related—that is, the higher the price of apples, the lower the quantity of apples demanded.



**4. In Exhibit 4(a), determine the slope between points C and D.**

The slope of a line on a graph is the ratio of the change in the variable on the vertical axis (the “rise”) to the change in the variable on the horizontal axis (the “run”), or slope =  $\Delta Y/\Delta X$ . In Exhibit 4(a), the value of X at point C is 30, and at point D is 40; thus, from C to D, X increases by 10. The value of Y at point C is 20, and at point D, Y = 10; therefore, from C to D, Y decreases by 10. The slope of the line between points C and D is  $-10/10$ , or  $-1$ .

**5. In Exhibit 4(b), determine the slope between points A and D.**

Using the same methodology as described above, the slope between points A and D =  $+2$ .

**6. What is the special characteristic of a 45-degree line?**

The special characteristic of a 45-degree line is that any point on it is equidistant from both the horizontal and vertical axes—or, in layperson’s terms, at any point on the 45° line, the values of X and Y are equal.

**7. What is the slope of a 45-degree line?**

The slope of a 45-degree line is always  $+1$ .

**8. When is a pie chart better than a bar chart for illustrating data?**

A pie chart is a convenient way to illustrate values that, when added together, equal a whole. Thus, while both pie charts and bar graphs can be used to show magnitudes, pie charts are preferable when the values being graphed are percentages—such as the allocation of the federal budget or the location of world oil reserves.

**9. Plot the following data and specify the type of relationship between the two variables. (Place “Price” on the vertical axis and “Quantity Supplied” on the horizontal axis.)**

Price of Apples (\$)	Quantity Supplied of Apples
0.25	350
0.50	400
0.70	500
0.95	700
1.00	800
1.10	1,000

The variables are positively, or directly, related—that is, when the price of apples rises, the quantity of apples supplied also rises.

