1 TEN PRINCIPLES OF ECONOMICS

WHAT'S NEW IN THE NINTH EDITION:

There are no major changes to this chapter.

LEARNING OBJECTIVES:

By the end of this chapter, students should understand:

- Explain how scarcity influences decisions.
- Explain how individuals evaluate opportunity costs to make decisions.
- Explain how marginal analysis influences decision making.
- Apply basic, economic principles of individual decision making that determine how an economy generally works.
- Explain how the terms of trade can lead to gains.
- Given a scenario, identify the distribution system being used.

CONTEXT AND PURPOSE:

Chapter 1 is the first chapter in a three-chapter section that serves as the introduction to the text. Chapter 1 introduces ten fundamental principles on which the study of economics is based. In a broad sense, the rest of the text is an elaboration on these ten principles. Chapter 2 will develop how economists approach problems while Chapter 3 will explain how individuals and countries gain from trade.

The purpose of Chapter 1 is to lay out ten economic principles that will serve as building blocks for the rest of the text. The ten principles can be grouped into three categories: how people make decisions, how people interact, and how the economy works as a whole. Throughout the text, references will be made repeatedly to these ten principles.

KEY POINTS:

- The fundamental lessons about individual decision making are that people face trade-offs among alternative goals, that the cost of any action is measured in terms of forgone opportunities, that rational people make decisions by comparing marginal costs and marginal benefits, and that people change their behavior in response to the incentives they face.
- The fundamental lessons about interactions among people are that trade and interdependence can be mutually beneficial, that markets are usually a good way of coordinating economic activity among people, and that the government can potentially improve market outcomes by remedying a market failure or by promoting greater economic equality.
- The fundamental lessons about the economy as a whole are that productivity is the ultimate source of improving living standards, that growth in the quantity of money is the ultimate source of inflation, and that society faces a short-run trade-off between inflation and unemployment.

CHAPTER OUTLINE:

I. Introduction

Begin by pointing out that economics is a subject that students must confront in their daily lives. Point out that they already spend a great deal of their time thinking about economic issues: changes in prices, buying decisions, use of their time, concerns about employment, etc.

A. The word "economy" comes from the Greek word *oikonomos* meaning "one who manages a household."

B. Both households and economies face many decisions about how to allocate resources.

C. Resources are scarce so they must be managed carefully.

You will want to start the semester by explaining to students that part of learning economics is understanding a new vocabulary. Economists generally use very precise (and sometimes different) definitions for words that are commonly used outside of the economics discipline. Therefore, it will be helpful to students if you follow the definitions provided in the text as much as possible.

D. Definition of **scarcity: the limited nature of society's resources.**

E. Definition of **economics: the study of how society manages its scarce resources.**

Because most college freshmen and sophomores have limited experiences with viewing the world from a cause-and-effect perspective, do not underestimate how challenging these principles will be for the student.

As you discuss the ten principles, make sure that students realize that it is okay if they do not grasp each of the concepts completely or find each of the arguments fully convincing. These ideas will be explored more completely throughout the text.

II. How People Make Decisions

A. Principle #1: People Face Trade-offs

1. "There ain't no such thing as a free lunch." To get something that we like, we usually have to give up, or trade for, something else that we also like.

2. Examples include how students spend their time, how a family decides to spend its income, how the U.S. government spends tax dollars, and how regulations may protect the environment at a cost to firm owners.

3. An important trade-off that society faces is the trade-off between efficiency and equality.

   a. Definition of **efficiency: the property of society getting the most it can from its scarce resources.**

   b. Definition of **equality: the property of distributing economic prosperity uniformly among the members of society.**

   c. For example, tax dollars paid by wealthy Americans and then distributed to those less fortunate may improve equality but lower the return to hard work and therefore reduce the level of output produced by our resources.

   d. This implies that the cost of this increased equality is a reduction in the efficient use of our resources.

4. Recognizing that trade-offs exist does not indicate what decisions should or will be made.

B. Principle #2: The Cost of Something Is What You Give Up to Get It

1. Making decisions requires individuals to consider the benefits and costs of some action.

2. What are the costs of going to college?

   a. We should not count room and board (unless they are more expensive at college than elsewhere) because the student would have to pay for food and shelter even if she were not in school.

   b. We should count the value of the student's time because she could be working for pay instead of attending classes and studying.

3. Definition of **opportunity cost: whatever must be given up in order to obtain some item.**

One of the hardest ideas for students to grasp is that "free" things are not truly free. Provide students with many examples of such "free" things with hidden costs, especially the value of time. Suggested examples include the time students spend waiting in line for "free" sporting event tickets at their universities, time spent relaxing in the sun outside their residence halls, or driving on a road with no tolls but lots of congestion.

C. Principle #3: Rational People Think at the Margin

1. Economists generally assume that people are rational.

   a. Definition of **rational people: people who systematically and purposefully do the best they can to achieve their objectives.**

   b. Consumers want to purchase the goods and services that allow them the greatest level of satisfaction given their incomes and the prices they face.

   c. Firm managers want to produce the level of output that maximizes the profits the firms earn.

2. Many decisions in life involve incremental decisions: Should I remain in school this semester? Should I take another course this semester? Should I study another hour for tomorrow's exam?

   a. Definition of **marginal change: a small incremental adjustment to a plan of action.**

   b. Example: Suppose that you are considering watching a movie tonight. You pay $40 a month for a streaming service that gives you unlimited access to its film library. If you typically watch 8 movies a month, the average cost of a movie is $5. The marginal cost, however, is zero because you pay the same $40 regardless how many movies you stream. At the margin, streaming is free. When deciding whether to watch a movie, a rational person would compare the marginal benefit of watching a movie to the marginal cost. In this case, the only cost is the value of your time.

   c. Suppose that flying a 200-seat plane across the country costs the airline $100,000, which means that the average cost of each seat is $500. Suppose that the plane is minutes from departure and a passenger is willing to pay $300 for a seat. Should the airline sell the seat for $300? In this case, the marginal cost of an additional passenger is very small.

   d. Another example: Why is water so cheap while diamonds are expensive? The marginal benefit of a good depends on how many units a person already has. Because water is plentiful, the marginal benefit of an additional cup is small. Because diamonds are rare, the marginal benefit of an extra diamond is high.

3. A rational decision maker takes an action if and only if the marginal benefit is at least as large as the marginal cost.

D. Principle #4: People Respond to Incentives

1. Definition of **incentive: something that induces a person to act.**

2. Because rational people make decisions by weighing costs and benefits, their decisions may change in response to incentives.

   a. When the price of a good rises, consumers will buy less of it because its cost has risen.

   b. When the price of a good rises, producers will allocate more resources to the production of the good because the benefit from producing the good has risen.

3. Many public policies change the costs and benefits that people face. Sometimes policymakers fail to understand how policies alter incentives and behavior and a policy may lead to unintended consequences.

4. Example: Seat belt laws increase the use of seat belts but lower the incentives of individuals to drive safely. This leads to an increase in the number of car accidents. This also leads to an increased risk for pedestrians.

If you include any incentive-based criteria on your syllabus, discuss it now. For example, if you reward class attendance (or penalize students who do not attend class), explain to students how this change in the marginal benefit of attending class (or marginal cost of missing class) can be expected to alter their behavior.

III. How People Interact

A. Principle #5: Trade Can Make Everyone Better Off

1. Trade is not like a sports contest, where one side gains and the other side loses.

2. Consider trade that takes place inside your home. Your family is likely to be involved in trade with other families on a daily basis. Most families do not build their own homes, make their own clothes, or grow their own food.

3. Countries benefit from trading with one another as well.

4. Trade allows for specialization in products that countries (or families) can do best.

Activity 1—Getting Dressed in the Global Economy

Type:	In-class assignment
Topics:	Specialization, interdependence, self-interest, consumer choice, trade
Materials needed:	None
Time:	20 minutes
Class limitations:	Works in any class size

Purpose
The advantages of specialization and division of labor are very clear in this example. The worldwide links of the modern economy are also illustrated. We depend on thousands of people we don't know, won't see, and don't think about to get dressed each morning. Self-interest follows naturally from interdependence. Wages, profits, and rents give people the incentive to perform these varied tasks. We depend on them to clothe us and they depend on our purchases for their incomes.

Instructions
Ask the class to answer the following questions. Give them time to write an answer to each question, then discuss their answers before moving on to the next question. The answer to the first question can be brief. The second question is the core of the assignment and takes several minutes. Ask them to list as many categories of workers as possible. The third question introduces demand concepts; you can introduce most of the determinants of demand during this discussion. For the fourth question, ask the class to look at the country-of-origin tags sewn in their garments.

1. Where did your clothes come from?
2. Who worked to produce your clothes?
3. What things do you consider when buying a garment?
4. In what countries were your clothes produced?

Common Answers and Points for Discussion
1. Where did your clothes come from?

There are many possible ways to answer, but many students will say "the mall" or another retail outlet. Some may say "a factory," "a sweatshop," or "a foreign country."

Mention the importance of markets. Ask "Is anyone wearing something made by themselves, a friend, or a relative?" and discuss distribution versus production.

2. Who worked to produce your clothes?

There are many possible answers; garment and textile workers are obvious but most students will also list workers dealing with raw materials, transportation, management, design, or machinery. Some may think more broadly to investors, road crews, bankers, engineers, or accountants.

3. What things do you consider when buying a garment?

Most answers focus on preferences (fit, style, quality, color). Price is cited less frequently. Ask about the importance of price until someone volunteers that income is important. Prices of substitute goods and expectations of price changes may also be mentioned.

4. In what countries were your clothes produced?

A large number of countries will be represented, even in small classes. Asia is always well represented. Latin American and European goods appear in smaller numbers. African products are conspicuously absent.

B. Principle #6: Markets Are Usually a Good Way to Organize Economic Activity

1. Many countries that once had centrally planned economies have abandoned this system and are trying to develop market economies.

2. Definition of **market economy: an economy that allocates resources through the decentralized decisions of many firms and households as they interact in markets for goods and services.**

3. Market prices reflect both the value of a product to consumers and the cost of the resources used to produce it.

Explain to students that when households and firms do what is best for themselves, they often end up doing what is best for society, as if guided by market forces—or an invisible hand. Spend some time and emphasize the magic of the market. Use numerous examples to show students that the market most often allocates resources to their highest valued use.

4. When a government interferes in a market and prevents price from adjusting, household and firm decisions become distorted.

5. Centrally planned economies failed because they did not allow the market to work.

6. *FYI: Adam Smith and the Invisible Hand*

a. Adam Smith's 1776 work suggested that although individuals are motivated by self-interest, an invisible hand guides this self-interest into promoting society's economic well-being.

b. Smith's insights are at the center of modern economics and will be analyzed more fully in the chapters to come.

7. Case Study: "Adam Smith Would Have Loved Uber"

C. Principle #7: Governments Can Sometimes Improve Market Outcomes

1. The invisible hand will only work if the government enforces property rights.

a. Definition of **property rights: the ability of an individual to own and exercise control over scarce resources.**

2. There are two broad reasons for the government to interfere with the economy: the promotion of efficiency and equality.

3. Government policy can improve efficiency when there is market failure.

a. Definition of **market failure: a situation in which a market left on its own fails to allocate resources efficiently**.

4. Examples of Market Failure

a. Definition of **externality: the impact of one person's actions on the well-being of a bystander.**

b. Definition of **market power: the ability of a single economic actor (or small group of actors) to have a substantial influence on market prices.**

c. Because a market economy rewards people for their ability to produce things that other people are willing to pay for, there will be an unequal distribution of economic well-being.

5. Note that the principle states that the government *can* improve market outcomes. This is not saying that the government always *does* improve market outcomes.

IV. How the Economy as a Whole Works

A. Principle #8: A Country's Standard of Living Depends on Its Ability to Produce Goods and Services

1. Differences in living standards from one country to another are quite large.

2. Changes in living standards over time are also great.

3. The explanation for differences in living standards lies in differences in productivity.

4. Definition of **productivity: the quantity of goods and services produced by each unit of labor input.**

5. High productivity implies a high standard of living.

6. Thus, policymakers must understand the impact of any policy on our ability to produce goods and services.

B. Principle #9: Prices Rise When the Government Prints Too Much Money

1. Definition of **inflation: an increase in the overall level of prices in the economy.**

2. When the government creates a large amount of money, the value of money falls, leading to price increases.

3. Examples: Germany after World War I (in the early 1920s) and the United States in the 1970s.

C. Principle #10: Society Faces a Short-Run Trade-off between Inflation and Unemployment

1. Most economists believe that the short-run effect of a monetary injection is lower unemployment and higher prices.

a. An increase in the amount of money in the economy stimulates spending and increases the quantity of goods and services sold in the economy. The increase in the quantity of goods and services sold will cause firms to hire additional workers.

b. An increase in the demand for goods and services leads to higher prices over time.

2. The short-run trade-off between inflation and unemployment plays a key role in the analysis of the business cycle.

3. Definition of **business cycle: fluctuations in economic activity, such as employment and production.**

4. Policymakers can exploit this trade-off by using various policy instruments, but the extent and desirability of these interventions is a subject of continuing debate.

5. This debate heated up during the early years of Obama's presidency. The severe downturn in the economy led policymakers to try to stimulate demand, but some feared that the end result would be inflation.

SOLUTIONS TO TEXT PROBLEMS:

Questions for Review

1. Examples of trade-offs include time trade-offs (such as studying one subject over another or studying at all compared to engaging in social activities) and spending trade-offs (such as whether to use your last 15 dollars to purchase a pizza or to buy a study guide for that tough economics course).

2. To figure out the opportunity cost of a vacation to Disney World, you would include the monetary costs of: admission, travel, souvenirs. You would also include the cost of time spent on vacation. The time cost depends on your next best use of that time; if it is staying home and watching TV, the time cost may be small, but if it is working an extra week hours at your job, the time cost is the money you could have earned. You would NOT include the costs of food and lodging unless they exceeded the costs you would have incurred had you not gone to Disney World. In that case, you would only include the additional costs, not the total costs of food and lodging.

3. The marginal benefit of a glass of water depends on your circumstances. If you have just run a marathon or you have been walking in the desert sun for three hours, the marginal benefit is very high. But if you have been drinking a lot of liquids recently, the marginal benefit is quite low. The point is that even the necessities of life, like water, do not always have large marginal benefits.

4. Policymakers need to think about incentives so they can understand how people will respond to the policies they put in place. The text's example of seat belt laws shows that policy actions can have unintended consequences. If incentives matter a lot, they may lead to a very different type of policy; for example, some economists have suggested putting knives in steering columns so that people will drive much more carefully! While this suggestion is silly, it highlights the importance of incentives.

5. Trade between two countries is not a game where one loses and one wins because trade can make both better off. By allowing specialization, trade between people and trade between countries can improve everyone's welfare.

6. The "invisible hand" of the marketplace represents the idea that even though individuals and firms are all acting in their own self-interest, prices and the marketplace guide them to do what is good for society as a whole.

7. The two main causes of market failure are externalities and market power. An externality is the effect of one person's actions on the well-being of a bystander, such as from pollution or the creation of knowledge. Market power refers to the ability of a single person (or small group of people) to unduly influence market prices, such as in a town with only one well or only one cable television company.

8. Productivity is important because a country's standard of living depends on its ability to produce goods and services. The greater a country's productivity (the amount of goods and services produced from each hour of a worker's time), the greater its standard of living will be.

9. Inflation is an increase in the overall level of prices in the economy. Inflation is caused by increases in the quantity of a nation's money.

10. Inflation and unemployment are negatively related in the short run. Thus, reducing inflation entails costs to society in the form of higher unemployment in the short run.

Problems and Applications

1. a. A family deciding whether to buy a new car faces a trade-off between the cost of the car and other things they might want to buy. For example, buying the car might mean they must give up going on vacation for the next two years. Also, fuel efficient cars are more expensive but regular cars require spending more on gas. Smaller cars are less expensive, but bigger cars mean saving time by avoiding multiple trips.

   b. For a member of Congress deciding how much to spend on national parks, one trade-off is between parks and other spending items or tax cuts. If more money goes into the park system, that may mean less spending on national defense or on transportation. Or instead of spending more money on the park system, taxes could be reduced. Another tradeoff when deciding how much to spend on national parks is spending a small amount on a lot of parks or a larger amount on a single park.

   c. When a company president decides whether to open a new factory, the decision is based on whether the new factory will increase the firm's profits compared to other alternatives. For example, the company could upgrade existing equipment or expand existing factories. The bottom line is: Which method of expanding production will increase profit the most?

   d. In deciding how much to prepare for class, a professor faces a trade-off between the value of improving the quality of the lecture compared to other things she could do with her time, such as working on additional research or enjoying some leisure time.

   e. In deciding whether to go to graduate school, the student faces a trade-off between his possible earnings with a bachelor's degree and the benefits of an increased education (such as higher future earnings and greater knowledge). The student also faces the trade-off between spending time with family or on leisure and spending time studying. Also, the student may face the tradeoff between taking out student loans and buying a home or car with a loan.

2. When the benefits of something are psychological, such as going on a vacation, it is not easy to compare benefits to costs to determine if it is worth doing. But there are two ways to think about the benefits. One is to compare the vacation with what you would do in its place. If you did not go on

vacation, would you buy something like a new set of golf clubs? Then you can decide if you would rather have the new clubs or the vacation. A second way is to think about how hard you had to work to earn the money to pay for the vacation. You can then decide if the psychological benefits of the vacation were worth the psychological cost of working.

3. If you are thinking of going skiing instead of working at your part-time job, the cost of skiing includes its monetary and time costs, which includes the opportunity cost of the wages you are giving up by not working. If the choice is between skiing and going to the library to study, then the cost of skiing is its monetary and time costs including the value of time spent studying.

4. If you spend $100 now instead of saving it for a year and earning 5 percent interest, you are giving up the opportunity to spend $105 one year from now.

5. The fact that you have already sunk $5 million is not relevant to your decision anymore, because that money is gone. What matters now is the chance to earn profits at the margin. If you spend another $1 million and can generate sales of $3 million, you'll earn $2 million in marginal profit, so you should do so. You are right to think that the project has lost a total of $3 million ($6 million in costs and only $3 million in revenue) and you should not have started it. However, if you do not spend the additional $1 million, you will not have any sales and your losses will be $5 million. What matters now is minimizing your loss. In fact, you would pay up to $3 million to complete development; any more than that, and you will not be increasing profit at the margin.

6. a. When welfare recipients have their benefits cut off after two years, they have a greater incentive to find jobs than if their benefits were to last forever.
   b. The loss of benefits means that someone who cannot find a job will get no income at all, so the distribution of income will become less equal. But the economy will be more efficient, because welfare recipients have a greater incentive to find jobs. Thus, the change in the law is one that increases efficiency but reduces equality.

7. a. Efficiency: The market failure comes from the market power of the cable TV firm.

   b. Equality

   c. Efficiency: An externality arises because secondhand smoke harms nonsmokers.

   d. Efficiency: The market failure occurs because of Standard Oil's market power.

   e. Equality

   f. Efficiency: There is an externality because of accidents caused by drunk drivers.

8. a. If everyone were guaranteed the best healthcare possible, much more of our nation's output would be devoted to medical care than is now the case. Would that be efficient? If you believe that doctors have market power and restrict health care to keep their incomes high, you might think efficiency would increase by providing more healthcare. But more likely, if the government mandated increased spending on healthcare, the economy would be less efficient because it would give people more healthcare than they would choose to pay for. From the point of view of equality, if poor people are less likely to have adequate healthcare, providing more health care would represent an improvement. Each person would have a more equal slice of the economic pie, though the pie would consist of more healthcare and less of other goods.

   b. When workers are laid off, equality considerations argue for the unemployment benefits system to provide them with some income until they can find new jobs. After all, no one plans to be laid

off, so unemployment benefits are a form of insurance. But there is an efficiency problem—why work if you can get income for doing nothing? The economy is not operating efficiently if people remain unemployed for a long time, and unemployment benefits encourage unemployment. Thus, there is a trade-off between equality and efficiency. The more generous unemployment benefits are, the less income is lost by an unemployed person, but the more that person is encouraged to remain unemployed. So greater equality reduces efficiency.

9. Because average income in the United States has roughly doubled every 35 years, we are likely to have a better standard of living than our parents, and a much better standard of living than our grandparents. This is mainly the result of increased productivity; an hour of work produces more goods and services than it used to. Thus, incomes have continuously risen over time, as has the standard of living.

10. If Americans save more and it leads to more spending on factories, there will be an increase in production and productivity, because the same number of workers will have more equipment to work with. The benefits from higher productivity will go to both the workers, who will get paid more because they are producing more, and the factory owners, who will get a return on their investments. There is no such thing as a free lunch, however, because when people save more, they are giving up spending. They get higher incomes at the cost of buying fewer goods.

11. When governments print money, they impose a "tax" on anyone who is holding money, because the value of money is decreased.

2 THINKING LIKE AN ECONOMIST

WHAT'S NEW IN THE NINTH EDITION:

There is a new *In the News* feature on "Why Tech Companies Hire Economists."

LEARNING OBJECTIVES:

By the end of this chapter, students should understand:

- Explain how the circular flow diagram explains the economy.
- Describe how the production possibilities frontier explains aggregate production.
- Determine if an output level is exhibiting allocative or productive efficiency.
- Describe opportunity cost in the context of the production possibilities frontier.
- Describe the factors that cause the production possibilities frontier to shift.
- Contrast macroeconomic concepts versus microeconomic concepts.
- Contrast when an economist acts as a policy adviser and when an economist acts as a scientist.
- Explain the difference between positive and normative economics.
- Given a scenario, identify the source of disagreement between two economists.
- Classify the different functions an economist may serve.

CONTEXT AND PURPOSE:

Chapter 2 is the second chapter in a three-chapter section that serves as the introduction of the text. Chapter 1 introduced ten principles of economics that will be revisited throughout the text. Chapter 2 develops how economists approach problems while Chapter 3 will explain how individuals and countries gain from trade.

The purpose of Chapter 2 is to familiarize students with how economists approach economic problems. With practice, they will learn how to approach similar problems in this dispassionate systematic way. They will see how economists employ the scientific method, the role of assumptions in model building, and the application of two specific economic models. Students will also learn the important distinction between two roles economists can play: as scientists when we try to explain the economic world and as policymakers when we try to improve it.

KEY POINTS:

- Economists try to address their subject with a scientist's objectivity. Like all scientists, they make appropriate assumptions and build simplified models to understand the world around them. Two simple economic models are the circular-flow diagram and the production possibilities frontier.

- The field of economics is divided into two subfields: microeconomics and macroeconomics. Microeconomists study decision making by households and firms and the interactions among households and firms in the marketplace. Macroeconomists study the forces and trends that affect the economy as a whole.

- A positive statement is an assertion about how the world *is*. A normative statement is an assertion about how the world *ought to be*. When economists make normative statements, they are acting more as policy advisers than as scientists.

- Economists who advise policymakers sometimes offer conflicting advice either because of differences in scientific judgments or because of differences in values. At other times, economists are united in the advice they offer, but policymakers may choose to ignore the advice because of the many forces and constraints imposed by the political process.

CHAPTER OUTLINE:

I. The Economist as Scientist

   A. Economists Follow the Scientific Method.

      1. Observations help us to develop theory.

      2. Data can be collected and analyzed to evaluate theories.

      3. Using data to evaluate theories is more difficult in economics than in physical science because economists are unable to generate their own data and must make do with whatever data are available.

      4. Thus, economists pay close attention to the natural experiments offered by history.

   B. Assumptions Make the World Easier to Understand.

      1. Example: to understand international trade, it may be helpful to start out assuming that there are only two countries in the world producing only two goods. Once we understand how trade would work between these two countries, we can extend our analysis to a greater number of countries and goods.

      2. One important role of a scientist is to understand which assumptions one should make.

      3. Economists often use assumptions that are somewhat unrealistic but will have small effects on the actual outcome of the answer.

   C. Economists Use Economic Models to Explain the World around Us.

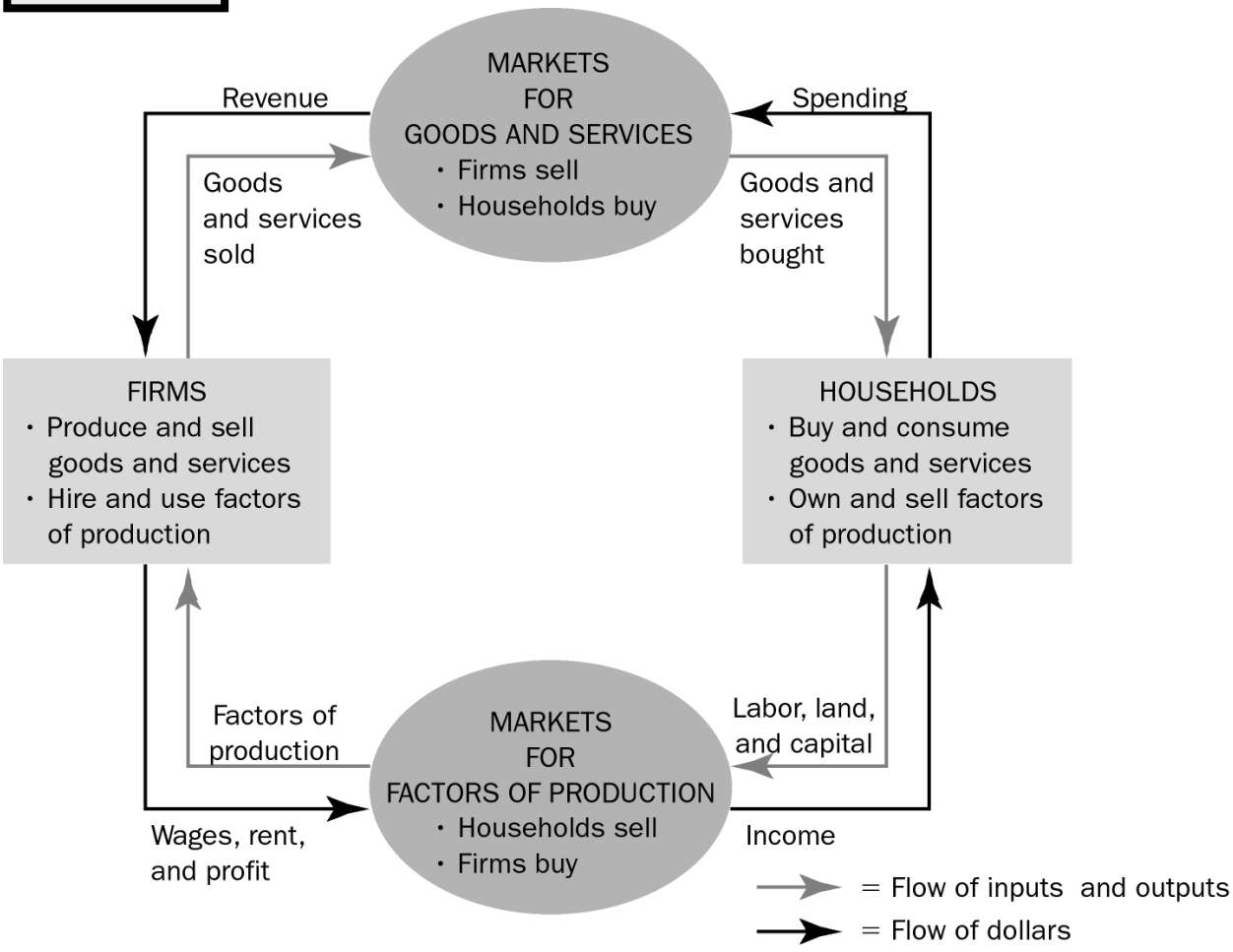
To illustrate to the class how simple but unrealistic models can be useful, bring a road map to class. Point out how unrealistic it is. For example, it does not show where all of the stop signs, gas stations, or restaurants are located. It assumes that the earth is flat and two-dimensional. But, despite these simplifications, a map usually helps travelers get from one place to another. Thus, it is a good model.

1. Most economic models are composed of diagrams and equations.

2. The goal of a model is to simplify reality to increase our understanding. Assumptions help to simplify reality.

D. Our First Model: The Circular Flow Diagram

Figure 1



1. Definition of **<u>circular-flow diagram</u>: a visual model of the economy that shows how dollars flow through markets among households and firms.**

2. This diagram is a very simple model of the economy. Note that it ignores the roles of government and international trade.

   a. There are two decision makers in the model: households and firms.

b. There are two markets: the market for goods and services and the market for factors of production.

c. Firms are sellers in the market for goods and services and buyers in the market for factors of production.

d. Households are buyers in the market for goods and services and sellers in the market for factors of production.

e. The inner loop represents the flows of inputs and outputs between households and firms.

f. The outer loop represents the flows of dollars between households and firms.

E. Our Second Model: The Production Possibilities Frontier

1. Definition of **production possibilities frontier: a graph that shows the combinations of output that the economy can possibly produce given the available factors of production and the available production technology.**

Spend more time with this model than you think is necessary. Be aware that students need to feel confident with this first graphical and mathematical model. Be deliberate with every point. If you lose them with this model, they may be gone for the rest of the course.

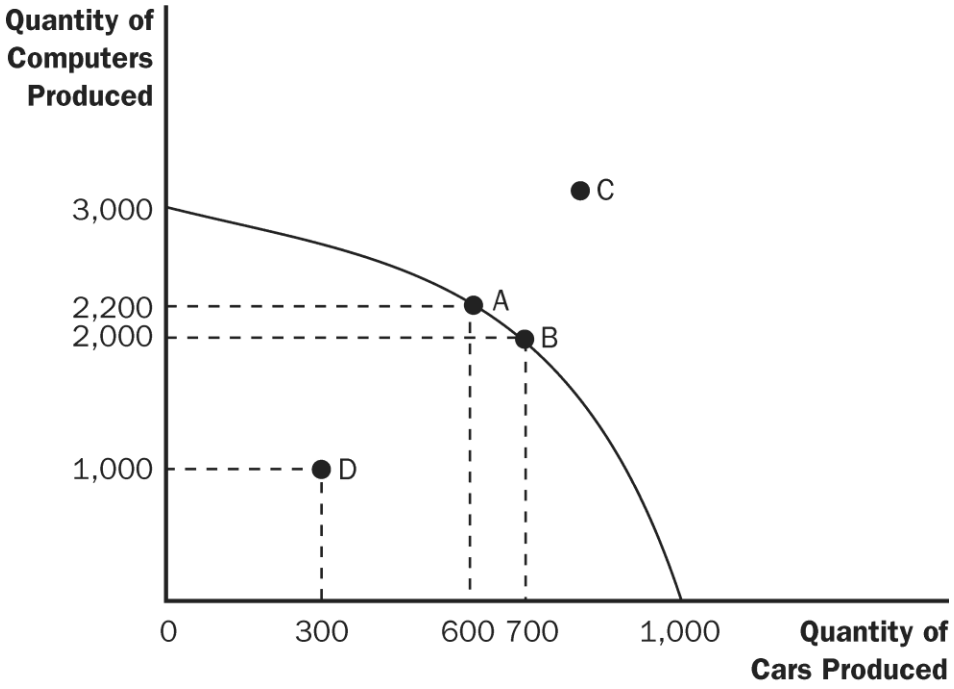
2. Example: an economy that produces two goods, cars and computers.

a. If all resources are devoted to producing cars, the economy would produce 1,000 cars and zero computers.

b. If all resources are devoted to producing computers, the economy would produce 3,000 computers and zero cars.

c. More likely, the resources will be divided between the two industries, producing some cars and some computers. The feasible combinations of output are shown on the production possibilities frontier.

Figure 2



You may want to include time dimensions for variables. This will help students to realize that a new production possibilities frontier occurs for each period. The axes show the levels of output per period.

ALTERNATIVE CLASSROOM EXAMPLE:
A small country produces two goods: mp3 players and music downloads. Points on a production possibilities frontier can be shown in a table or a graph:

	A	B	C	D	E
mp3 Players	0	100	200	300	400
Music Downloads	70,000	60,000	45,000	25,000	0

The production possibilities frontier should be drawn from the numbers above.

Students should be asked to calculate the opportunity cost of increasing the number of mp3 players produced by 100:
- between 0 and 100
- between 100 and 200
- between 200 and 300
- between 300 and 400

3. Because resources are scarce, not every combination of computers and cars is possible. Production at a point outside of the curve (such as C) is not possible given the economy's current level of resources and technology.

It is useful to point out that the production possibilities frontier depends on two things: the availability of resources and the level of technology.

4. Production is efficient at points on the curve (such as A and B). This implies that the economy is getting all it can from the scarce resources it has available. There is no way to produce more of one good without producing less of another.

5. Production at a point inside the curve (such as D) is inefficient.

   a. This means that the economy is producing less than it can from the resources it has available.

   b. If the source of the inefficiency is eliminated, the economy can increase its production of both goods.

6. The production possibilities frontier reveals Principle #1: People face trade-offs.

   a. Suppose the economy is currently producing 600 cars and 2,200 computers.

   b. To increase the production of cars to 700, the production of computers must fall to 2,000.

7. Principle #2 is also shown on the production possibilities frontier: The cost of something is what you give up to get it (opportunity cost).

   a. The opportunity cost of increasing the production of cars from 600 to 700 is 200 computers.

   b. Thus, the opportunity cost of each car is two computers.

8. The opportunity cost of a car depends on the number of cars and computers currently produced by the economy.

   a. The opportunity cost of a car is high when the economy is producing many cars and few computers.

   b. The opportunity cost of a car is low when the economy is producing few cars and many computers.

9. Economists generally believe that production possibilities frontiers often have this bowed-out shape because some resources are better suited to the production of cars than computers (and vice versa).

Be aware that students often have trouble understanding why opportunity costs rise as the production of a good increases. You may want to use several specific examples of resources that are more suited to producing cars than computers (e.g., an experienced mechanic) as well as examples of resources that are more suited to producing computers than cars (e.g., an experienced computer programmer).

10. The production possibilities frontier can shift if resource availability or technology changes. Economic growth can be illustrated by an outward shift of the production possibilities frontier.

Figure 3

You may also want to teach students about budget constraints at this time (call them "consumption possibilities frontiers"). This reinforces the idea of opportunity cost, and allows them to see how opportunity cost can be measured by the slope. Also, it will introduce students to the use of straight-line production possibilities frontiers (which appear in Chapter 3). However, be careful if you choose to do this as students often find the difference between straight-line and concave production possibilities frontiers challenging.

ALTERNATIVE CLASSROOM EXAMPLE:
Ivan receives an allowance from his parents of $20 each week. He spends his entire allowance on two goods: ice cream cones (which cost $2 each) and tickets to the movies (which cost $10 each).

Students should be asked to calculate the opportunity cost of one movie and the opportunity cost of one ice cream cone.

Ivan's consumption possibilities frontier (budget constraint) can be drawn. It should be noted that the slope is equal to the opportunity cost and is constant because the opportunity cost is constant.

Ask students what would happen to the consumption possibilities frontier if Ivan's allowance changes or if the price of ice cream cones or movies changes.

F. Microeconomics and Macroeconomics

1. Economics is studied on various levels.

   a. Definition of **microeconomics: the study of how households and firms make decisions and how they interact in markets.**

   b. Definition of **macroeconomics: the study of economy-wide phenomena, including inflation, unemployment, and economic growth.**

2. Microeconomics and macroeconomics are closely intertwined because changes in the overall economy arise from the decisions of individual households and firms.

3. Because microeconomics and macroeconomics address different questions, each field has its own set of models which are often taught in separate courses.

G. *In the News: Why Tech Companies Hire Economists*

1. High tech firms are hiring economists because economists have the analytical and technical tools to help design efficient markets.

2. Economists are willing to move from government and academic positions to high tech firms because of the promise of big data sets and big salaries.

II. The Economist as Policy Adviser

A. Positive versus Normative Analysis

1. Example of a discussion of minimum-wage laws: Portia says, "Minimum-wage laws cause unemployment." Noah says, "The government should raise the minimum wage."

2. Definition of **positive statements: claims that attempt to describe the world as it is.**

3. Definition of **normative statements: claims that attempt to prescribe how the world should be.**

4. Positive statements can be evaluated by examining data, while normative statements involve personal viewpoints.

5. Positive views about how the world works affect normative views about which policies are desirable.

Use several examples to illustrate the differences between positive and normative statements and stimulate classroom discussion. Possible examples include the minimum wage, budget deficits, tobacco taxes, legalization of marijuana, and seat-belt laws.

Have students bring in newspaper articles and in groups, identify each statement in an editorial paragraph as being a positive or normative statement. Discuss the differences among news stories, editorials, and blogs and the analogy to economists as scientists and as policy advisers.

6. Much of economics is positive; it tries to explain how the economy works. But those who use economics often have goals that are normative. They want to understand how to improve the economy.

B. Economists in Washington

1. Economists are aware that trade-offs are involved in most policy decisions.

2. The president receives advice from the Council of Economic Advisers (created in 1946).

3. Economists are also employed by administrative departments within the various federal agencies such as the Office of Management and Budget, the Department of Treasury, the Department of Labor, the Congressional Budget Office, and the Federal Reserve.

4. The research and writings of economists can also indirectly affect public policy.

C. Why Economists' Advice Is Not Always Followed

1. The process by which economic policy is made differs from the idealized policy process assumed in textbooks.

2. Economists offer crucial input into the policy process, but their advice is only part of the advice received by policymakers.

III. Why Economists Disagree

A. Differences in Scientific Judgments

1. Economists may disagree about the validity of alternative positive theories or about the size of the effects of changes in the economy on the behavior of households and firms.

2. Example: some economists feel that a change in the tax code that would eliminate a tax on income and create a tax on consumption would increase saving in this country. However, other economists feel that the change in the tax system would have little effect on saving behavior and therefore do not support the change.

B. Differences in Values

C. Perception versus Reality

1. While it seems as if economists do not agree on much, this is in fact not true. Table 1 contains 20 propositions that are endorsed by a majority of economists.

Table 1

2. Almost all economists believe that rent control adversely affects the availability and quality of housing.

3. Most economists also oppose barriers to trade.

D. *Ask the Experts: Ticket Resale*

1. The first "Ask the Experts" box shows that 80% of economic experts agree that laws that limit resale of tickets make potential audience members worse off.

Use the "Ask the Expert" questions and responses from economists throughout the text to spark discussions. In this case, ask students their opinion on ticket scalping laws. Discuss the opportunity for potential audience members to pay a price higher than the stated ticket price to be able to attend the event rather than be excluded from the event because there are no more tickets available at the stated ticket price.

IV. Appendix—Graphing: A Brief Review

Many instructors may be unaware of how much trouble beginning students have grasping the most basic graphs. It is important for instructors to make sure that students are comfortable with these techniques.

A. Graphs of a Single Variable

Figure A-1

1. Pie Chart
2. Bar Graph
3. Time-Series Graph

B. Graphs of Two Variables: The Coordinate System

Figure A-2

1. Economists are often concerned with relationships between two or more variables.
2. Ordered pairs of numbers can be graphed on a two-dimensional grid.
   a. The first number in the ordered pair is the *x*-coordinate and tells us the horizontal location of the point.
   b. The second number in the ordered pair is the *y*-coordinate and tells us the vertical location of the point.
3. The point with both an *x*-coordinate and *y*-coordinate of zero is called the origin.
4. Two variables that increase or decrease together have a positive correlation.
5. Two variables that move in opposite directions (one increases when the other decreases) have a negative correlation.

C. Curves in the Coordinate System

1. Often, economists want to show how one variable affects another, holding all other variables constant.

Table A-1

Figure A-3

   a. An example of this is a demand curve.

b. The demand curve shows how the quantity of a good a consumer wants to purchase varies as its price varies, holding everything else (such as income) constant.

c. If income does change, this will alter the amount of a good that the consumer wants to purchase at any given price. Thus, the relationship between price and quantity desired has changed and must be represented as a new demand curve.

Figure A-4

d. A simple way to tell if it is necessary to shift the curve is to look at the axes. When a variable that is not named on either axis changes, the curve shifts.

D. Slope

Figure A-5

1. We may want to ask how strongly a consumer reacts if the price of a product changes.

   a. If the demand curve is very steep, the quantity desired does not change much in response to a change in price.

   b. If the demand curve is very flat, the quantity desired changes a great deal when the price changes.

2. The slope of a line is the ratio of the vertical distance covered to the horizontal distance covered as we move along the line ("rise over run").

$$\text{slope} = \frac{\Delta y}{\Delta x}$$

3. A small slope (in absolute value) means that the demand curve is relatively flat; a large slope (in absolute value) means that the demand curve is relatively steep.

E. Cause and Effect

1. Economists often make statements suggesting that a change in Variable A causes a change in Variable B.

2. Ideally, we would like to see how changes in Variable A affect Variable B, holding all other variables constant.

3. This is not always possible and could lead to a problem caused by omitted variables.

Figure A-6

a. If Variables A and B both change at the same time, we may conclude that the change in Variable A caused the change in Variable B.

b. But, if Variable C has also changed, it is entirely possible that Variable C is responsible for the change in Variable B.

4. Another problem is reverse causality.

Figure A-7

a. If Variable A and Variable B both change at the same time, we may believe that the change in Variable A led to the change in Variable B.

b. However, it is entirely possible that the change in Variable B led to the change in Variable A.

c. It is not always as simple as determining which variable changed first because individuals often change their behavior in response to a change in their expectations about the future. This means that Variable A may change before Variable B but only because of the expected change in Variable B.

There are two very good examples in the text that you should use in class. To discuss the omitted variable problem, point out to students that a rise in the sales of cigarette lighters is positively related to the number of individuals diagnosed with lung cancer. To discuss reverse causality, show that an increase in minivan sales is followed by an increase in birth rates.

SOLUTIONS TO TEXT PROBLEMS:

Questions for Review

1. Economics is a science because economists use the scientific method. They devise theories, collect data, and then analyze these data in an attempt to verify or refute their theories about how the world works. Economists use theory and observation like other scientists, but they are limited in their ability to run controlled experiments. Instead, they must rely on natural experiments.

2. Economists make assumptions to simplify problems without substantially affecting the answer. Assumptions can make the world easier to understand.

3. An economic model cannot describe reality exactly because it would be too complicated to understand. A model is a simplification that allows the economist to see what is truly important.

4. There are many possible answers.

5. There are many possible answers, including interactions involving government or international trade.

6. Figure 3 shows a production possibilities frontier between milk and cookies (PPF_1). If a disease kills half of the economy's cow population, less milk production is possible, so the *PPF* shifts inward (PPF_2). Note that if the economy produces all cookies, it does not need any cows and production is unaffected. But if the economy produces any milk at all, then there will be less production possible after the disease hits.

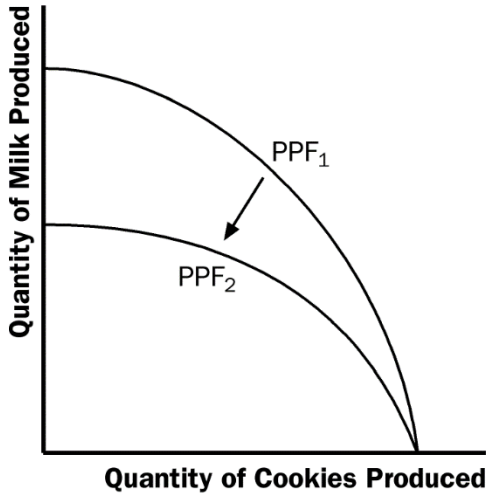


Figure 3

7. An outcome is efficient if the economy is getting all it can from the scarce resources it has available. In terms of the production possibilities frontier, an efficient point is a point on the frontier, such as point A in Figure 4. When the economy is using its resources efficiently, it cannot increase the production of one good without reducing the production of the other. A point inside the frontier, such as point B, is inefficient since more of one good could be produced without reducing the production of another good.

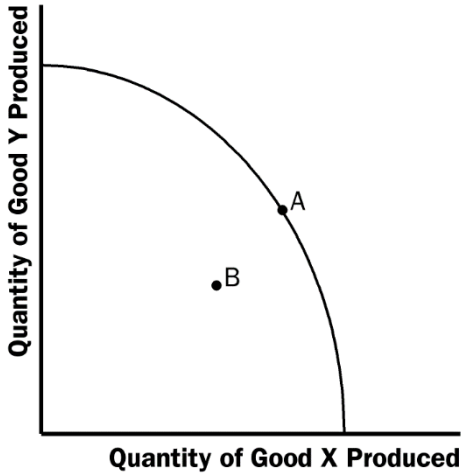


Figure 4

8. The two subfields in economics are microeconomics and macroeconomics. Microeconomics is the study of how households and firms make decisions and how they interact in specific markets. Macroeconomics is the study of economy-wide phenomena, including inflation, unemployment, and economic growth.

9. Positive statements are descriptive and make a claim about how the world is, while normative statements are prescriptive and make a claim about how the world ought to be. Here is an example. Positive: A rapid growth rate of money is the cause of inflation. Normative: The government should keep the growth rate of money low.

10. Economists sometimes offer conflicting advice to policymakers for two reasons: (1) economists may disagree about the validity of alternative positive theories about how the world works; and (2) economists may have different values and, therefore, different normative views about what public policy should try to accomplish.

Problems and Applications

1. See Figure 5; the four transactions are shown.

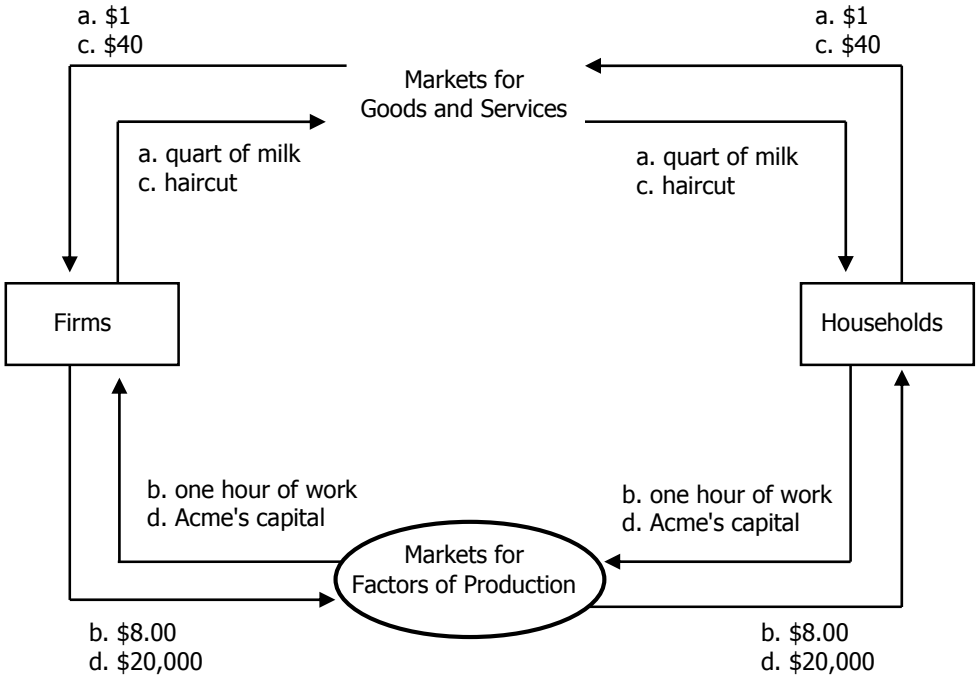


Figure 5

2. a. Figure 6 shows a production possibilities frontier between guns and butter. It is bowed out because of the law of increasing opportunity costs. As the economy moves from producing many guns and a little butter (point H) to producing fewer guns and more butter (point D), the opportunity cost of each additional unit of butter increases because the resources best suited to producing guns are shifting toward the production of butter. Thus, the number of guns given up to produce one more unit of butter is increasing.

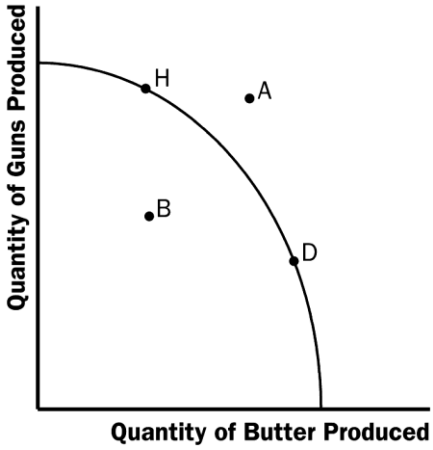


Figure 6

b. Point A is impossible for the economy to achieve; it is outside the production possibilities frontier. Point B is feasible but inefficient because it is inside the production possibilities frontier.

c. The Hawks might choose a point like H, with many guns and not much butter. The Doves might choose a point like D, with a lot of butter and few guns.

d. If both Hawks and Doves reduced their desired quantity of guns by the same amount, the Hawks would get a bigger peace dividend because the production possibilities frontier is much flatter at point H than at point D. As a result, the reduction of a given number of guns, starting at point H, leads to a much larger increase in the quantity of butter produced than when starting at point D.

3. See Figure 7. The shape and position of the frontier depend on how costly it is to maintain a clean environment—the productivity of the environmental industry. Gains in environmental productivity, such as the development of new way to produce electricity that emits fewer pollutants, lead to shifts

of the production-possibilities frontier, like the shift from PPF_1 to PPF_2 shown in the figure.

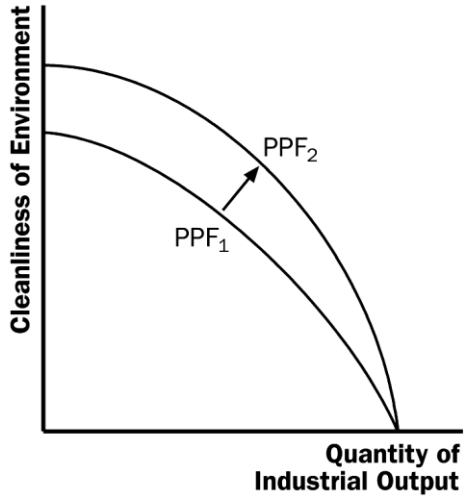


Figure 7

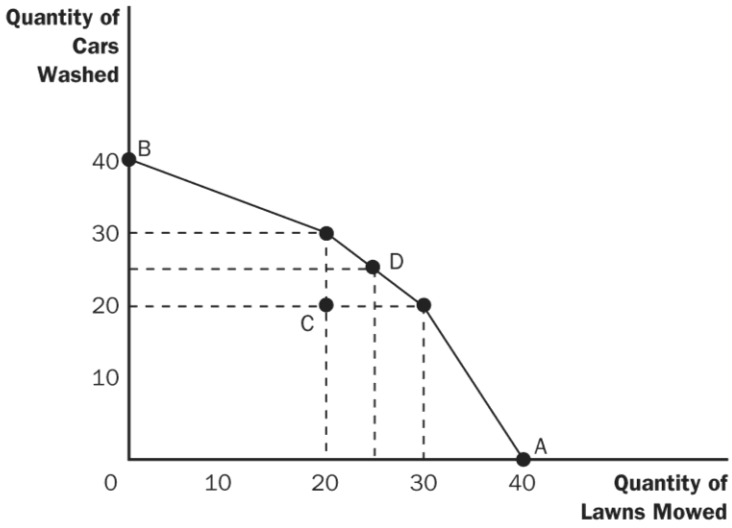


Figure 8

4. a. A: 40 lawns mowed; 0 washed cars
   B: 0 lawns mowed, 40 washed cars
   C: 20 lawns mowed; 20 washed cars
   D: 25 lawns mowed; 25 washed cars

   b. The production possibilities frontier is shown in Figure 8. Points A, B, and D are on the frontier, while point C is inside the frontier.

   c. Larry is equally productive at both tasks. Moe is more productive at washing cars, while Curly is more productive at mowing lawns.

   d. Allocation C is inefficient. More washed cars and mowed lawns can be produced by simply reallocating the time of the three individuals.

5. a. A family's decision about how much income to save is related to microeconomics.

   b. The effect of government regulations on auto emissions is related to microeconomics.

   c. The impact of higher saving on economic growth is related to macroeconomics.

   d. A firm's decision about how many workers to hire is related to microeconomics.

   e. The relationship between the inflation rate and changes in the quantity of money is related to macroeconomics.

6. a. The statement that society faces a short-run trade-off between inflation and unemployment is a positive statement. It deals with how the economy *is*, not how it should be. Since economists have examined data and found that there is a short-run negative relationship between inflation and unemployment, the statement is a fact.

b. The statement that a reduction in the rate of money growth will reduce the rate of inflation is a positive statement. Economists have found that money growth and inflation are very closely related. The statement thus tells how the world is, and so it is a positive statement.

c. The statement that the Federal Reserve should reduce the rate of money growth is a normative statement. It states an opinion about something that should be done, not how the world is.

d. The statement that society ought to require welfare recipients to look for jobs is a normative statement. It does not state a fact about how the world is. Instead, it is a statement of how the world should be and is thus a normative statement.

e. The statement that lower tax rates encourage more work and more saving is a positive statement. Economists have studied the relationship between tax rates and work, as well as the relationship between tax rates and saving. They have found a negative relationship in both cases. So the statement reflects how the world is and is thus a positive statement.