

CHAPTER 2

ECONOMIC TOOLS AND ECONOMIC SYSTEMS

In this chapter, you will find:

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INTRODUCTION

This chapter emphasizes key ideas in economic analysis, such as opportunity cost, the production possibilities frontier, absolute and comparative advantage, the division of labor and the gains from specialization, and how economic systems answer the three economic questions of what, how, and for whom. All these ideas address the economic problem of how to allocate scarce resources among unlimited wants. The use of graphs was introduced in the Appendix to Chapter 1. In this chapter, graphs are integrated into the discussion.

LEARNING OUTCOMES

2-1 Describe the relationship between choice and opportunity

Resources are scarce, but human wants are unlimited. Because you cannot satisfy all your wants, you must choose, and whenever you choose, you must forgo some option. Choice involves an opportunity cost. The opportunity cost of the selected option is the value of the best alternative forgone.

2-2 Explain how comparative advantage, specialization, and exchange affect economic outcomes (output)

The law of comparative advantage says that the individual, firm, region, or country with the lowest opportunity cost of producing a particular good should specialize in that good. Specialization according to the law of comparative advantage promotes the most efficient use of resources. The specialization of labor increases efficiency by (a) taking advantage of individual preferences and natural abilities, (b) allowing each worker to develop expertise and experience at a particular task, (c) reducing the need to shift between different tasks, and (d) allowing for the introduction of more specialized machines and large-scale production techniques.

2-3 Outline how economies function as production systems

The production possibilities frontier, or PPF, shows the productive capabilities of an economy when all resources are used efficiently. The frontier's bowed-out shape reflects the law of increasing opportunity cost, which arises because some resources are not perfectly adaptable to the production of different goods. Over time, the frontier can shift in or out as a result of changes in the availability of resources, in technology, or in the rules of the game. The frontier demonstrates several economic concepts, including efficiency, scarcity, opportunity cost, the law of increasing opportunity cost, economic growth, and the need for choice.

2-4 Describe different economic systems and the decision-making rules that define them

All economic systems, regardless of their decision-making processes, must answer three basic questions: What is to be produced? How is it to be produced? And for whom is it to be produced? Economies answer the questions differently, depending on who owns the resources and how economic activity is coordinated. Economies can be directed by market forces, by the central plans of government, or, in most cases, by a mix of the two.

CHAPTER OUTLINE WITH POWERPOINT SCRIPT

Choice and Opportunity Cost

USE POWERPOINT SLIDE 2 FOR THE FOLLOWING SECTION

Opportunity Cost: The value of the best alternative that is forgone. Because of scarcity, whenever people make a choice, another opportunity is forgone.

USE POWERPOINT SLIDE 3 FOR THE FOLLOWING SECTION

Opportunity Cost Is Subjective: Only the individual making the choice can identify the most attractive alternative. Calculating opportunity cost requires time, information, and the assumption that people rationally choose the most valued alternative.

USE POWERPOINT SLIDE 4 FOR THE FOLLOWING SECTION

Sunk Cost and Choice

- **Sunk cost:** A cost that has already been incurred and cannot be recovered.
- **Economic decision makers** should ignore sunk costs and consider only those costs that are affected by the choice.

Comparative Advantage, Specialization, and Exchange

USE POWERPOINT SLIDES 5-6 FOR THE FOLLOWING SECTION

The law of comparative advantage: The individual, firm, region or country with the *lower opportunity cost* of producing a particular output should specialize in producing that output.

- **Absolute advantage:** The ability to produce a product with fewer resources than other producers require.
- **Comparative advantage:** The ability to produce a product at a lower opportunity cost than other producers face. Resources are allocated most efficiently when production and trade conform to the law of comparative advantage.

USE POWERPOINT SLIDE 7 FOR THE FOLLOWING SECTION

Specialization and Exchange

- **Barter:** A system of exchange in which products are traded directly for other products.
- **Money:** A medium of exchange in economies with extensive specialization.

USE POWERPOINT SLIDES 8-9 FOR THE FOLLOWING SECTION

Division of Labor and Gains from Specialization

- Specialization of labor
 - Takes advantage of individual preferences and natural abilities
 - Allows workers to develop more experience at a task
 - Reduces the need to shift between tasks
 - Permits the introduction of labor-saving machinery
 - May be tedious and injury prone due to repetitive motion

The Economy's Production Possibilities

USE POWERPOINT SLIDES 10-13 FOR THE FOLLOWING SECTION

Efficiency and the Production Possibilities Frontier

- The production possibilities frontier (PPF) is a simple model designed to depict the production capabilities of an economy given current resources. The PPF assumes:
 - Output is limited to two broad classes of products: consumer goods and capital goods.
 - Production takes place over a given time period.
 - The economy's resources are fixed in quantity and quality over this period.
 - The available technology does not change during the period.
 - The "rules of the game" are also assumed fixed.
- **The PPF** identifies possible combinations of the two types of goods that can be produced when all available resources are employed efficiently. Resources are employed efficiently when there is no change that could increase the production of one good without decreasing the production of the other good.
 - **Efficient production:** getting the most from available resources, indicated by points *along* the production possibilities frontier.
 - **Inefficient production:** points *inside* the PPF
 - **Unattainable production:** points outside the PPF

USE POWERPOINT SLIDE 14 FOR THE FOLLOWING SECTION

Shape of the Production Possibilities Frontier

- The PPF derives its *bowed-out* (concave) shape from the law of increasing opportunity cost.
- Opportunity cost increases as the economy produces more of one good and less of the other because resources in the economy are not all perfectly adaptable to the production of both types of goods.
- If all resources were perfectly adaptable to alternative uses, the PPF would be a straight line, reflecting a constant opportunity cost along the PPF.

USE POWERPOINT SLIDES 15-18 FOR THE FOLLOWING SECTION

What Can Shift the Production Possibilities Frontier?

- **Economic Growth:** is reflected by an outward shift of the PPF.
- **Changes in resource availability:** people working longer hours, war
- **Capital stock:** more capital goods produced during this period shifts the PPF outward the next period
- **Technology:** discoveries that employ resources more efficiently
- **Rules of the Game:** improvements in the formal and informal institutions that support the economy shift the PPF outward.

USE POWERPOINT SLIDE 19 FOR THE FOLLOWING SECTION

What We Learn from the PPF

- It illustrates the concepts of efficiency, scarcity, opportunity cost, economic growth, and the need for choice.
- It does not tell us which combination to choose. How society goes about choosing depends on the nature of the economic system.

USE POWERPOINT SLIDE 20 FOR THE FOLLOWING SECTION

Three Questions Every Economic System Must Answer:

- **What** goods and services are to be produced?
- **How** are goods and services to be produced?
- **For whom** are goods and services to be produced?

USE POWERPOINT SLIDES 21-26 FOR THE FOLLOWING SECTION

Economic Systems

Pure Capitalism: Individual decision making through markets

- Private ownership of all resources.
- Market prices generated in free markets guide resources to their most productive use.
- Goods and services are channeled to consumers who value them the most.
- Adam Smith and the “invisible hand”
- **Flaws of a pure market system:**
 - No central authority protects property rights, enforces contracts, or ensures that rules of the game are followed.
 - People with no resources to sell could starve.
 - Some producers may try to monopolize markets by eliminating the competition.
 - Production or consumption of some goods involves damaging byproducts (i.e., pollution).
 - Private firms have no incentive to produce public goods.

Because of these limitations, *government* has been given some role in most market economies.

Pure Command System: Resources are directed and production is coordinated not by market forces but by the “command” or central plan, of government.

- In theory, property is owned communally; central plans spell out answers to what, for whom, and how much; and individual choices are incorporated into central plans (communism).
- **Flaws of a pure command system:**
 - Running an economy is so complicated that some resources are used inefficiently.
 - Because nobody in particular owns resources, each person has less incentive to employ them in their highest-valued use, so some resources are wasted.
 - Central plans may reflect more the preferences of central planners than those of society.
 - Because government is responsible for all production, the variety of products tends to be more limited than in a capitalist economy.
 - Each individual has less personal freedom in making economic choices.

USE POWERPOINT SLIDE 27 FOR THE FOLLOWING SECTION

Mixed and Transitional Economies

- No country exemplifies either type of economic system in its pure form.
- The United States represents a mixed system, with government directly accounting for about one-third of all economic activity. In addition, government regulates the private sector in a variety of ways (e.g., antitrust, workplace safety, environmental quality, and zoning activities).

Economies Based on Custom or Religion: Molded largely by custom or religion—for example, the caste system in India or charging interest under Islamic law.

CHAPTER SUMMARY

Resources are scarce, but human wants are unlimited. Because you cannot satisfy all your wants, you must choose, and whenever you choose, you must forgo some option. Choice involves an opportunity cost. The opportunity cost of the selected option is the value of the best alternative forgone.

The law of comparative advantage says that the individual, firm, region, or country with the lowest opportunity cost of producing a particular good should specialize in that good. Specialization according to the law of comparative advantage promotes the most efficient use of resources.

The specialization of labor increases efficiency by (a) taking advantage of individual preferences and natural abilities, (b) allowing each worker to develop expertise and experience at a particular task, (c)

reducing the need to shift between different tasks, and (d) allowing for the introduction of more specialized machines and large-scale production techniques.

The production possibilities frontier, or PPF, shows the productive capabilities of an economy when all resources are used efficiently. The frontier's bowed-out shape reflects the law of increasing opportunity cost, which arises because some resources are not perfectly adaptable to the production of different goods. Over time, the frontier can shift in or out as a result of changes in the availability of resources, in technology, or in the rules of the game. The frontier demonstrates several economic concepts, including efficiency, scarcity, opportunity cost, the law of increasing opportunity cost, economic growth, and the need for choice.

All economic systems, regardless of their decision-making processes, must answer three basic questions: What is to be produced? How is it to be produced? And for whom is it to be produced? Economies answer the questions differently, depending on who owns the resources and how economic activity is coordinated. Economies can be directed by market forces, by the central plans of government, or, in most cases, by a mix of the two.

TEACHING POINTS

1. This chapter contains several fundamental concepts that should be fully discussed because they are used throughout the text to discuss economic choice in a variety of settings. When discussing opportunity cost and choice, be sure to distinguish between those costs that are associated with marginal decision making and those that are not (i.e., sunk costs). Also, many students will not immediately recognize that non-monetary costs are components of opportunity costs so it helps to emphasize this point.
2. Comparative advantage is a second important concept emphasized in this chapter. For additional examples of comparative advantage, consider the classic example in which an attorney can type and file faster and more accurately than a secretary. Because of comparative advantage, it will usually pay the lawyer to hire a secretary rather than to do the typing and filing since the opportunity cost is lower. Another example would be for Hawaii to specialize in pineapple growing and then trade with Idaho for potatoes. This chapter makes the point that opportunity cost is a relative concept, based on relative rather than absolute resource requirements in the production of goods. Because comparative advantage implies the specialization of resource use, trade becomes important in allocating goods to consumers. Students often note that self-reliance is an admirable concept. The discussion of comparative advantage shows that specialization and exchange lead to a more efficient allocation of resources.
3. When drawing the production possibilities frontier, partition the horizontal axis into equal segments, and then show the ever-increasing amounts of the alternative good that must be sacrificed to obtain more of the good in question. You thereby illustrate the law of increasing opportunity costs. Students often confuse increasing total and increasing marginal opportunity costs. You should emphasize, through your construction, that it is incremental costs that are increasing. Draw your curve large with plenty of bow in it. Numerical examples are helpful to some students.
4. Sometimes people claim that the PPF is bowed out because of the law of diminishing returns. Diminishing returns, of course, assumes an increase in one type of resource, holding other resources constant. This is not the case along the PPF, since all resources tend to be reallocated between goods with movement along the PPF. You could incorporate the law of diminishing returns into your discussion by fixing capital between the sectors and then shifting only labor resources. The text's approach, however, is to assume that resources are not homogeneous; some are specific to the production of a particular good. The result is increasing opportunity costs and a bowed-out PPF.

5. Once the PPF is understood in terms of its construction and shape, it is important to emphasize the concepts that it illustrates. Scarcity is reflected by the fact that some output combinations are not feasible. The infinite number of output combinations that are feasible illustrates choice. Efficiency is illustrated when production occurs along the PPF, and the shape of the PPF illustrates the law of increasing opportunity costs. Furthermore, if resources are different, then the required specialization of resource usage implies that some form of trading occurs in order for each resource owner to consume all (both) goods.
6. A discussion of shifts in the production possibilities frontier leads naturally to a consideration of the sources of economic growth. Technological advance shifts the PPF. Such advances take time and require society to save, just as with the accumulation of physical capital. Emphasize that the PPF need not always shift out in a balanced way. Technological advance is often specific to an industry. Improvements to the rules of the game and in the education and health of the population may also lead to an outward shift in the PPF.
7. This chapter closes by considering how different economic systems answer the three economic questions. You may wish to discuss how numerous political systems have shifted toward more market-based economies over the past century to emphasize the capitalist approach. The chapter contains a fairly short reference to Adam Smith and his notion of the “invisible hand”. You may want to discuss this important concept in more detail.

SOLUTIONS TO PROBLEMS APPENDIX

1. (*Sunk Cost and Choices*) Suppose you go to a restaurant and buy an expensive meal. Halfway through, despite feeling full, you decide to clean your plate. After all, you think, you paid for the meal, so you are going to eat all of it. What’s wrong with this thinking?

This question highlights the importance of ignoring sunk costs in marginal decision making. Once you have purchased the meal, you cannot get your money back whether or not you finish the meal. There is no benefit to overeating.

2. (*Opportunity Cost*) You can either spend spring break working at home for \$80 per day for five days or go to Florida for the week. If you stay home, your expenses will total about \$100. If you go to Florida, the airfare, hotel, food and miscellaneous expenses will total about \$700. What’s your opportunity cost of going to Florida?

The opportunity cost is the total cost of going to Florida and includes dollar costs incurred as well as the forgone opportunity of working. Assuming you would work for 5 days if you stayed home,, the cost would total \$1,000: the \$700 cost of going to Florida plus the net value of what you could have earned—\$300 (\$400 in earnings less expenses of \$100)—if you stayed home.

3. (*Absolute and Comparative Advantage*) You have the following information concerning the production of wheat and cloth in the United States and the United Kingdom:

	<u>Labor Hours Required to Produce One Unit</u>	
	<u>United Kingdom</u>	<u>United States</u>
<i>Wheat</i>	2	1
<i>Cloth</i>	6	5

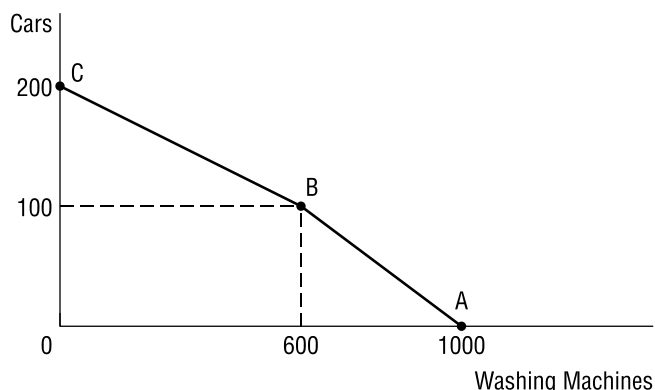
- a. What is the opportunity cost of producing a unit of wheat in the United Kingdom? In the United States?
 - b. Which country has an absolute advantage in producing wheat? In producing cloth?
 - c. Which country has a comparative advantage in producing wheat? In producing cloth?
 - d. Which country should specialize in producing wheat? In producing cloth?
- a. *In the United Kingdom, the opportunity cost of one unit of wheat is 1/3 unit of cloth (producing one unit of wheat takes 2 hours, the time that would allow you to produce only 1/3 of a unit of cloth). In the United States, the opportunity cost of one unit of wheat is 1/5 unit of cloth (producing one unit of wheat takes 1 hour, the time that would allow you to produce only 1/5 unit of cloth).*
 - b. *The United States has an absolute advantage in both goods; it is able to produce both products in less time than the United Kingdom requires.*
 - c. *The United States has a comparative advantage in wheat because it has the lowest opportunity cost of producing (one fifth cloth versus one third cloth for the United Kingdom), while the United Kingdom has the comparative advantage in cloth. (The opportunity cost of cloth in the United States is 5 wheat. The opportunity cost of cloth in the United Kingdom is 3 wheat.)*
 - d. *The United States should specialize in wheat, and the United Kingdom should specialize in cloth. The country with the lower opportunity cost of producing a good should specialize in producing that output.*
4. (Specialization) Provide some examples of specialized markets or retail outlets. What makes the Web so conducive to specialization?

Students' answers will vary according to their experiences. One specialized market is that for military weapons. The stock exchange provides a specialized market for buying and selling company shares, and there are specialized markets for selling government bonds and foreign currencies. Specialized retail outlets could include movie theaters specializing in "art" films, wine shops, cheese shops, language schools, and so forth. Media such as the Web allow firms in specialized markets to advertise their products at relatively low cost and also permit customers to conduct interactive on-line searches for relatively specialized goods and services.

5. (Shape of the PPF) Suppose a production possibilities frontier includes the following combinations:

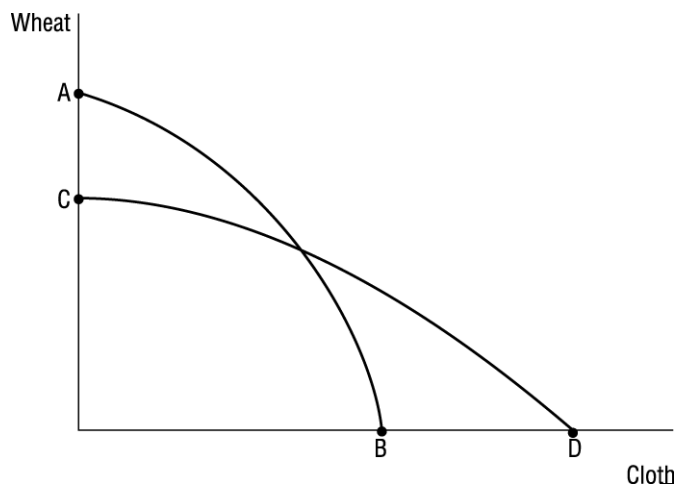
<u>Cars</u>	<u>Washing Machines</u>
0	1,000
100	600
200	0

- a. Graph the PPF, assuming that it has no curved segments.
- b. What is the cost of producing an additional car when 50 cars are being produced?
- c. What is the cost of producing an additional car when 150 cars are being produced?
- d. What is the cost of producing an additional washing machine when 50 cars are being produced? When 150 cars are being produced?
- e. What do your answers tell you about opportunity costs?

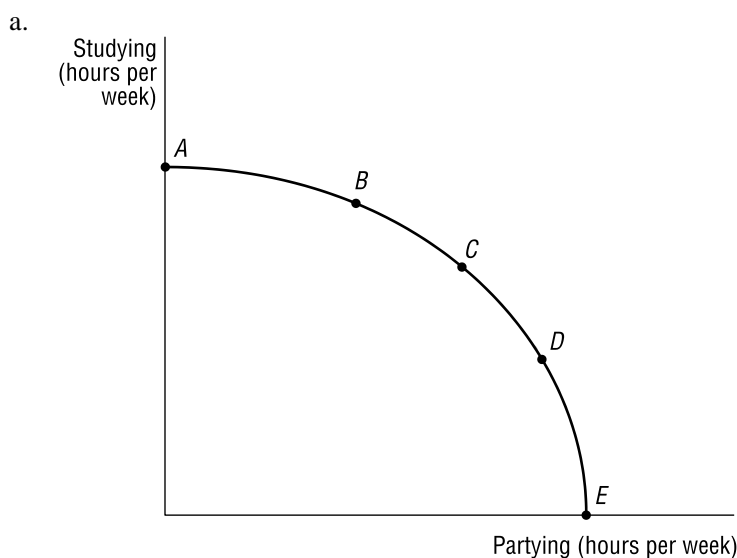


- a. The PPF drawn above is composed of two straight-line segments, AB and BC.
 - b. The cost of a car when 50 cars are produced is 4 washing machines. In the segment BC, as you move from 0 to 100 cars, you must give up $(1,000 - 600 = 400)$ washing machines). Thus, each additional car costs $400/100 = 4$ washing machines along segment BC of this PPF.
 - c. The cost of a car when 150 cars are produced is 6 washing machines. In the segment AB of this PPF, as you move from 100 to 200 cars, you must forgo 600 washing machines. Thus, each additional car costs $600/100 = 6$ washing machines along segment AB of this PPF. The 150 car costs you 6 washing machines.
 The cost of a washing machine when 50 cars are produced is one quarter of a car. In the segment BC, as you move from 600 to 1,000 washing machines, you must forgo 100 cars. $\{[100/(1000 - 600)]\} = 1/4$, the slope of segment BC of the PPF. Note: The PPF would indicate that when 50 cars are produced, 800 washing machines can be produced.
 - d. The cost of an additional washing machine when 150 cars are produced is one sixth of a car. In the segment AB, as you move from 0 to 600 washing machines, you must forego 100 cars. $(100/600) = 1/6$, the slope of segment AB of the PPF. Note: The PPF indicates that when 150 cars are produced, only 300 washing machines are produced. Also note that the answers to this question are the inverse of the answers to questions (b) and (c).
 - e. As you increase the production level of either good, its (opportunity) cost per unit eventually increases. When you go from 50 cars produced to 150 cars produced, the cost in terms of washing machines forgone rises from 4 washing machines to 6 washing machines. When you go from 300 washing machines produced to 800 washing machines produced, the opportunity cost in terms of cars forgone rises from $1/6$ of a car to $1/4$ of a car.
6. (Production Possibilities) Suppose an economy uses two resources (labor and capital) to produce two goods (wheat and cloth). Capital is relatively more useful in producing cloth, and labor is relatively more useful in producing wheat. If the supply of capital falls by 10 percent and the supply of labor increases by 10 percent, how will the PPF for wheat and cloth change?

The PPF will shift inward along the axis measuring cloth production and outward along the axis measuring wheat production. This is represented by a shift from CD to AB on the following graph:



7. (*Production Possibilities*) There's no reason why a production possibilities frontier could not be used to represent the situation facing an individual. Imagine your own PPF. Right now—today—you have certain resources—your time, your skills, perhaps some capital. And you can produce various outputs. Suppose you can produce combinations of two outputs, call them studying and partying.
- Draw your PPF for studying and partying. Be sure to label the axes of the diagram appropriately. Label the points where the PPF intersects the axes, as well as several other points along the frontier.
 - Explain what it would mean for you to move upward and to the left along your personal PPF. What kinds of adjustments would you have to make in your life to make such a movement along the frontier?
 - Under what circumstances would your personal PPF shift outward? Do you think the shift would be a “parallel” one? Why, or why not?



- Moving upward and to the left along the PPF could be represented by a move from point C to point B. You would be giving up some partying to engage in more studying. You would have to fo-*

cus your schedule so that you would frequent places where there were inducements to study rather than to party. The library, a quiet spot in the cafeteria, or a café playing classical music and offering quiet solitude would be your quest for at least a few more hours of the week.

- c. *The PPF drawn assumes that you have a fixed amount of time skills as well as some capital. Your time available can't change; there are only 24 hours in a day. However, your study skills could be enhanced by training or by acquiring a new computer. This increase in skills and capital in the production of studying would shift the PPF outward along the vertical axis, indicating that with the same time constraint, you are able to accomplish more studying. A parallel shift in the PPF could occur if that new computer also allowed you greater satisfaction partying on the internet. In this imagined example, the computer, the capital good, would enable you to do more of both in the same time.*

8. *(Shifting Production Possibilities)* Determine whether each of the following would cause the economy's PPF to shift inward, outward, or not at all:
- An increase in average length of annual vacations
 - An increase in immigration
 - A decrease in the average retirement age
 - The migration of skilled workers to other countries

Items a, c, and d all decrease the amount of labor available; thus, the PPF would shift inward. Item b increases the available labor, and thus the PPF would shift outward.

9. *(Economic Systems)* The United States is best described as having a “mixed” economy. What are some elements of command in the U.S. economy? What are some traditional elements?

The government represents an element of command in the U.S. economy. Government accounts for about one third of all economic activity. In addition, government regulates the private economy in a number of areas including antitrust, workplace safety, zoning, food safety, illegal activities, and so on. Elements of tradition or custom would include our style of dress, our choice of occupation similar to that of our parents, and our fierce adherence to the English system of measurement rather than the metric system used by the rest of the world.

Experiential Assignment

1. The following are some data on the U.S. economy taken from the *Economic Report of the President* at <http://www.gpo.gov/fdsys/> (you may have to use the Search tool and type in for example “Economic Report of the President 2014”—or whatever year you are interested in). (Reports from before 2004 can be found at <http://fraser.stlouisfed.org/publications/ERP/>.)

Year	Unemployment Rate	Real Government Spending (billions)	Real Civilian Spending (billions)
1982	9.7%	\$ 947.7	\$3,672.6
1983	9.6	960.1	3,943.6
1996	5.4	1,257.9	5,670.5
1997	4.9	1,270.6	5,920.8

- a. Have students sketch a production possibilities frontier for the years 1982 and 1983, showing the trade-off between public sector (government) and private-sector (civilian) spending. Assume that resource availability and technology were the same in both years, but notice that the unemployment rate was relatively high.
- b. Have students sketch a PPF for the years 1996 and 1997. Assume that resource availability and technology were the same in both years but higher than in 1982 and 1983. Note that the unemployment rate in the late 1990s was much lower than in the early 1980s.
- c. Ask them what lessons they learned about the U.S. economy of the past 30 years.