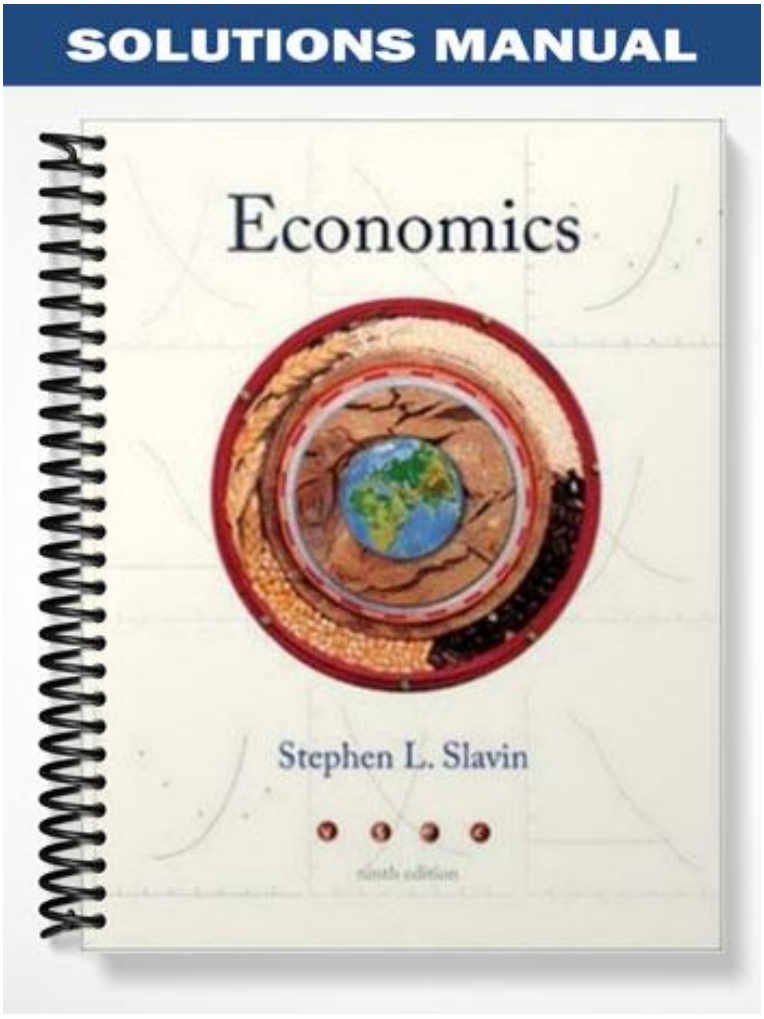
SOLUTIONS MANUAL



CHAPTER 2
Resource Utilization

A. After studying this chapter the student should be able to

1. Identify types of economic resources.
2. Apply the principle of efficient allocation of scarce resources to current economic issues.
3. Define and explain the importance of full employment and full production.
4. Draw a production possibilities frontier and show the importance of points on, inside, and outside the frontier curve.
5. Show economic growth on a production possibilities frontier.

B. Ideas for use in class

Getting started

1. Many of terms in this chapter will be familiar to students—but not in their technical economic meaning. For example, scarcity, production (meaning services in addition to goods), and full employment are terms likely to be misinterpreted students. Stress that colloquial understanding is not wrong; instead economists want to use these terms in a more precise manner. For example, full employment does not mean 0% unemployment.

2. Connect the terms labor, land, capital, and entrepreneurship to student experience. These terms are relatively easy to understand, so students likely will be able to provide correct examples. All students will participate if you use a think-pair-share activity in which students first think privately of an example, then share it with a partner. Finally, ask a few students to report their examples. (See Introduction for discussion of this and other similar techniques.)

   Students may wonder why economists bother to differentiate production resources into these seemingly obvious categories. Point out that one important task for economists is to determine *which* of these resources is most scarce so that production bottlenecks can be altered. Ask: Which resource is scarcest on your campus? In the United States? In Russia?

3. This chapter introduces the first graph in the textbook. Show students why graphs are a helpful device for illustrating economic concepts. Begin by explaining the production possibilities frontier in words. Point how that this description may be difficult to follow. Then show the same ideas in a simple table with a few entries. Finally, draw the production possibilities frontier. Point out that the graph shows the concept visually and has the added advantage of representing all possible combinations inputs, not just the few that were listed in the table.

Active learning strategies

1. Although most students will be able to read the graphs presented in this chapter, they may not fully understand all the underlying assumptions. Ask students to draw a production possibilities frontier from a table of data. Make certain that they are able to select the correct labels and choose a reasonable scale for each axis. Suggest that students use a full piece of paper so that errors are not hidden in a tiny graph.

2. Students can construct a production possibilities frontier based on their own experience. For the two outputs use their learning of two subjects. The constraining resource is their time in one week. Spending all ones time on one subject will lead to the most learning in that subject, but none in the other subject.

   This application can be used to show the law of increasing costs (see Appendix to Chapter 2) because the first hour of study will bring about more learning that the next hour of study and so on.

3. There are many examples that illustrate opportunity cost based on student experience, most importantly the decision to attend college. Ask students to brainstorm the cost of attending college. Likely they will focus on out of pocket expenses such as tuition and books. However, for many students the largest cost by far is foregone earnings, both what could have been earned during the time spent in school and the lost opportunity for promotion if the student could work full-time. Consider a follow-up project using the sources cited below.

4. For a more recent case study of the "guns versus butter" trade-off, examine the relative position of the U.S. and the former Soviet Union during the cold war. The U.S. spent an average of 6% of national output on armaments, while the Soviet Union spent 20% of national output on armaments. What was the opportunity cost for each country?

5. For an in-class experiment on the production possibilities frontier and diminishing returns, see http://www.marietta.edu/~delemeeg/expernom/Fall2003/blackwell.html,

   and John Neral and Margaret Ray, "Experimental Learning in the Undergraduate Classroom: Two Exercise," *Economic Inquiry*, 33 (1995) pp. 170–174.

C. Homework questions and projects

1. Students can analyze the impact on production of a shorter or longer work week. See recent political disputes in Europe on the work week, and articles

about the U.S. work week (see, *The State of Working America* http://www.stateofworkingamerica.org/*)*.

2. The trade-offs between military and civilian spending are often in the news. For competing estimates of the Iraq war costs, see Lawrence Lindsay's *What a President Should Know…but Most Learn Too Late*, and Joseph E. Stiglitz and Linda J. Bilmes *The Three Trillion Dollar War: The True Cost of the Iraq Conflict*.

3. The benefits and costs of a college education can be studied in several ways:

   - Examine recent research on the returns to college education. See http://www.census.gov/Press-Release/www/releases/archives/education/004214.html.
   - Students can study the relative pay of different professions, including differences by major at: http://stats.bls.gov/opub/mlr/1998/03/art5full.pdf.

Answers to Multiple-Choice Questions

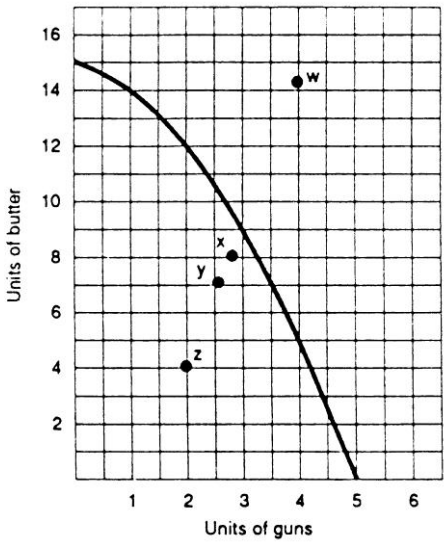
1.	c	17.	a
2.	b	18.	d
3.	b	19.	b
4.	c	20.	d
5.	a	21.	b
6.	b	22.	c
7.	c	23.	c
8.	a	24.	b
9.	b	25.	d
10.	c	26.	a
11.	c	27.	b
12.	a	28.	d
13.	b	29.	b
14.	a		
15.	c		
16.	b		

Answers to Fill-In Questions

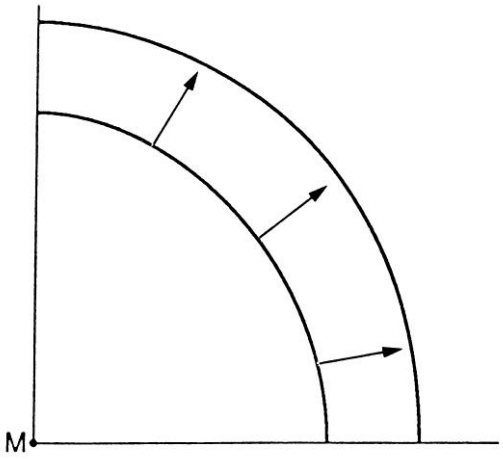
1. underemployed
2. scarcity
3. unlimited; limited
4. the opportunity cost of producing additional units of this good increases
5. increasing costs
6. the sacrifice of not buying the jacket
7. five percent
8. (1) blue laws; (2) child labor laws; and (3) Americans' preference for daylight weekday work hours.
9. underemployment; less than full production; inefficient allocation of resources.
10. production possibilities frontier or curve
11. within (or inside)
12. (1) improving the level of technology and (2) increasing the amount of resources.

Answers to Problems

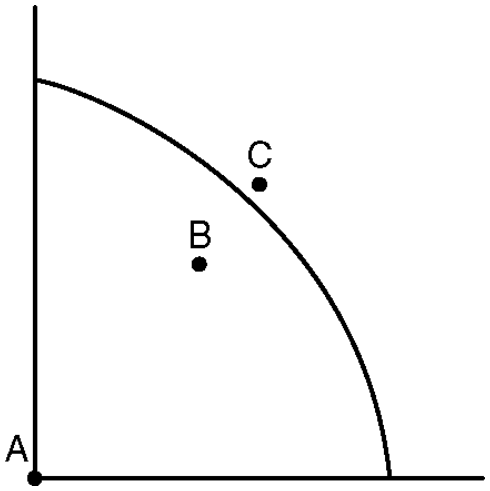
1. No—we could produce either more cars or more houses.
2. Yes (by moving towards the production possibilities frontier)
3. No
4.



5. and 6.



7.



8. 2 units of butter, 1 unit of guns

9. (a) 10 VCRs
(b) 20 camcorders
(c) 50 camcorders
(d) 10 VCRs

10. Moving from point E toward point A, we give up increasing amounts of camcorders for each gain of 10 VCRs. The opportunity cost of moving from E to D is 10 camcorders; from D to C, 20 camcorders; from C to B, 30 camcorders and from B to A, 50 camcorders.

Answers To Questions For Further Thought And Discussion

1. *If you were in a position to run our economy, what steps would you take to raise our rate of economic growth?*

Increase our savings rate, build more and better capital, have a larger and more skilled labor force, and improve the technology. The federal government could sponsor more basic research, which would boost our technology. Much of our technological advance over the last six decades has come from research funded by the military. A recent application is the Internet. Our labor force could be increased in size and quality by increased immigration. Employers have been clamoring to raise immigration quotas for skilled workers. We could also try to improve our educational system.

2. *Under what circumstances can we operate outside our production possibilities curve?*

   The most common circumstance has been during wartime when workers are more willing to work overtime, work at night and on weekends, and everyone is more willing to put forth that extra effort to help win the war. During times of great prosperity, such as in the last four or five years, we have reduced our unemployment rate well below the full employment rate of 5 percent.

3. *Give an example of an opportunity cost for an individual and for a nation.*

   Individual opportunity cost: If you spend the evening before an exam at a concert, you are giving up 15 points on your exam grade. If you buy a pair of jeans, you would not be able to buy 2 CDs.

   National opportunity cost: Buy building a highway, the nation gave up a new aircraft carrier. By providing $10 billion to hire new teachers, there was $10 billion less available for a tax cut.

4. *Would it be harder for a nation to attain full employment or full production? Explain.*

   Full employment is one of several conditions needed to attain full production. The other involves an efficient allocation of our resources. There would be no underemployment of resources, no employment discrimination, no misallocation of resources, and we would use the best available technology.

5. *Could a nation's production possibilities frontier ever shift inward? Discuss whatever might cause such a shift to occur.*

   A nation's production possibilities frontier could shift inward if its productive capacity declined—if the quantity or quality of its labor force declined, if the quantity or quality of its capital declined, or if it used a lower level of technology. The populations of several Western European countries have been declining for years, and in the United States, our birth rate has fallen so low that our population would have been falling if several million immigrants had not been moving here each year. During a war or a depression, the stock of capital usually falls. And if an economy could not afford much new investment, it is possible that older, less productive technology might be used. For example, if we could not afford the

investment, we would continue to use our older computers, and perhaps even buy older computers from other countries because we could not afford the newer ones. Indeed, we do export some of our older, obsolete capital to less developed countries.

6. *What is the opportunity cost you incurred by going to college?*

   This is one you can answer a lot better than me, but I'll try. It might be not holding a full time job, not spending several hours a day watching MTV, or it might be not lying on the beach, surfing, partying, or just hanging out. Maybe you're giving up a career playing major league baseball or being a rock star.

7. *Although the U.S. is one of the world's wealthiest nations, some of the federal government's budget decisions are severely constrained by scarcity. Can you think of one such decision that was in the recent economic news?*

   I'm at too much of a disadvantage to do more than guess at what would be in the recent economic news—possibly giving up a big tax cut to pay down the national debt, or maybe giving up a national health insurance plan to shore up Social Security.

8. *Why is scarcity central to economics?*

   If there were no scarcity of economic resources, we could produce as much as we needed or wanted, and there would be no need to economize.

9. *Can you think of any decision you have recently made that incurred opportunity costs?*

   Anything that involves giving up the next best alternative. For me it was revising this book instead of writing another book.

10. *Do you know any entrepreneurs? What do they do?*

    You would choose business owners and describe how they run their businesses.

11. *Why is entrepreneurship central to every business firm?*

    A firm cannot run by itself. Someone is needed to hire the land and labor, supply or raise the capital, and to make the major decisions. Business firms do not just spring up by themselves. Entrepreneurs recognize business opportunities and are able to take advantage of them by starting companies, running them, and building them into profitable enterprises.

12. *Explain the law of increasing costs, using a numerical example.*

    The law of increasing costs: As the output of one good expands, the opportunity cost of producing additional units of this good will entail larger and larger

opportunity costs. If we were producing bushels of wheat and neckties, if we were to keep expanding wheat production, we would need to give up increasing numbers of neckties. For example, if we were to increase wheat production by one bushel increments from 1 bushel to 5 bushels, we would have to give up producing 2, 5, 9, 17, and 30 neckties, respectively.

13. *Discuss the three concepts upon which the law of increasing cost is based.*

    (1) The law of diminishing returns: if units of a resource are added to a fixed proportion of other resources, eventually marginal output will decline.

    (2) Diseconomies of scale: inefficiencies that crop up as a firm continues to expand

    (3) Factor suitability: As output expands, we hire land, labor, and capital that is less and less suitable (because we hire the most suitable factors first).

14. *Practical Application: Underemployment of college graduates is a growing problem. If you were appointed to the board of trustees of your college, what measure would you suggest to alleviate this problem for the graduates of your school?*

    A substantial number of alumni own businesses or work for sizeable companies and should be invited to recruit graduating seniors. Also, intern programs could be set up with these companies.

    Recent graduates should be contacted about any available positions in their companies. And then, too, the names of the school's most prominent graduates could be used in ads placed in trade journals such as *The American Banker* and *Computer World.*