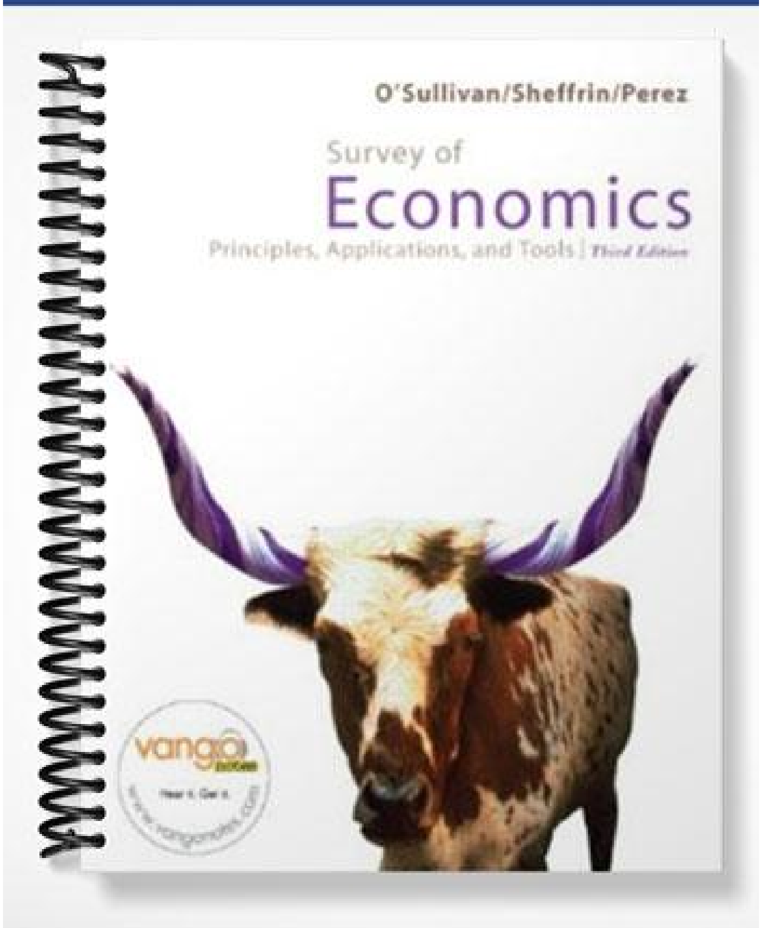
# SOLUTIONS MANUAL



# 2

# The Key Principles of Economics

## Chapter Summary

Chapter 2 introduces the key principles that are central to all economic theory:

- The *principle of opportunity cost* states that the opportunity cost of something is what you sacrifice to get it. Opportunity costs in production are generally increasing, and thus, the production possibilities curve is bowed outward.
- The *marginal principle* states that any activity should be increased as long as the marginal benefits of the additional activity exceed the marginal costs.
- The *principle of voluntary exchange* states that a voluntary exchange between two people makes both people better off.
- The *principle of diminishing returns* states that, in the short run, if use of one input is increased while all others are held constant, production will eventually increase at a decreasing rate.
- The *real-nominal principle* states that what matters to people is the real value or purchasing power of money or income, not its face or nominal value.

Here are the key questions that students should be able to answer by the end of the chapter. These questions appear in the chapter opener of the main text and again near the Applications within the chapter:

1. What is the opportunity cost of running a business?
2. What are society's trade-offs when choosing between different goods?
3. How do firms think at the margin?
4. What is the rationale for specialization and exchange?
5. Do farmers experience diminishing returns?
6. How does inflation affect the real minimum wage?
7. How does inflation affect lenders and borrowers?

## Approaching the Material

Continue the approach you developed in the first chapter, reaching students where they are. The decision to go to college is a great illustration of opportunity costs because students forgo earnings that they would have received from a full-time job. Apply the concept of diminishing returns to hours studying: if a student studies for five hours, will studying one additional hour really benefit him or her? Most of the students will have had jobs, so use the price of a gallon of gas or a burger per hour worked to explain real wages. Most students will have trouble with the marginal principle, so have plenty of examples ready. A seat on a bus or train that is not full works well. An extra passenger in a car for a road trip or another person watching a movie will also work.

# Chapter Outline

## 2.1 The Principle of Opportunity Cost

A. Definition
1. The **opportunity cost** of something is what you sacrifice to get it.
2. What you sacrifice is the *next best* alternative.
3. For example, if you choose to buy a cup of coffee, you are giving up the money it costs to buy it. What else would you have used the $2.00 for? The opportunity cost of the coffee is the one thing (or next best alternative) that you would buy if not the coffee.

### Teaching Tip

Ask the students what they would be doing if they weren't in class. Answers will range from sleeping, working, watching TV, studying, etc. You can make the point that the alternatives are infinite and computing the cost of them all is impossible. However, since they could only be doing one thing (not all of them) if they were not in class, determining the opportunity cost requires only knowing the one thing they would be doing.

B. Costs of College
1. The classic example of opportunity cost is the costs of going to college. Be sure to illustrate the implicit opportunity cost of foregone income as well as tuition, books, etc.

### Teaching Tip

It's also helpful to have a discussion about whether room and board should be considered a cost of college. If the person has to pay the same amount for room and board whether he/she goes to college or works, it should not be considered a cost of college.

*Review the key question from the chapter opener and its related Application:*

## Question 1: What is the opportunity cost of running a business?

### APPLICATION 1: THE OPPORTUNITY COSTS OF TIME AND INVESTED FUNDS

This Application illustrates the concept of opportunity costs of capital and time. The use of an inherited $10,000 to start a business results in an opportunity cost of $800 of interest foregone and $30,000 in foregone earnings.

### Teaching Tip

To reinforce the concepts, ask students what happens to their opportunity costs if interest rates or employment opportunities change. Money in the bank at a 10% interest rate is very different than money in the bank at a 1% interest rate. If you give up a minimum wage job, what does that cost you? Compare that cost to the cost of giving up a job that pays 20 dollars an hour.

C. Opportunity Cost and the Production Possibilities Curve

1. The **production possibilities curve**: A curve that shows the possible combinations of products that an economy can produce, given that its productive resources are fully employed and efficiently used. (See Figure 2.1 and show how an increase in the production of one good requires a decrease in the production of the other.)
2. Discussion of relevant points on the production possibilities graph
   a. Points on the curve are efficient and indicate an economy is utilizing all resources.
   b. Points inside the curve are inefficient and indicate an economy is not utilizing all resources or resources are not used in the least-cost manner.
   c. Points outside the curve are not feasible given current technologies and resources.
3. Shifts in the Production Possibilities Curve (See Figure 2.2 and show how points outside the PPC are feasible in the future if it shifts out due to increases in resources or technological innovation. It is also useful to discuss what might make the PPC shift in: a natural disaster, the Y2K bug, etc.)
   a. Increased resources
   b. Technological innovation

### Teaching Tip

Use something students are familiar with to construct their first production possibilities curve. Pick two classes, such as Economics and Marketing. Tell them they are going to allocate study time to produce grades in the classes. The choice involves how much study time to allocate for each class. You can start with an all-or-nothing scenario producing an A|F outcome and make adjustments from there. Once they are comfortable, remind them that everything else was held constant. Ask them what would happen to the curve if the professors were better teachers, if students had better study skills, smaller classes, better textbooks, upgraded computers, more time to study.

*Review the key question from the chapter opener and its related Application:*

## Question 2: What are society's trade-offs between different goods?

### APPLICATION 2: THE OPPORTUNITY COST OF MILITARY SPENDING

This Application examines the cost of military spending using the alternative goods and services that could have been provided. The Application uses examples from Malaysia and the current U.S. involvement in Iraq to show the opportunity costs of military spending. For Malaysia, opportunity costs are safe drinking water for 5 million people. For the United States, opportunity costs are at least 140 billion dollars' worth of alternative goods and services.

### Teaching Tip

You can use the fall of the Soviet Union as an opportunity cost discussion. Increased defense spending reduced the production of consumer goods, causing political unrest in the Russian economy.

## 2.2 The Marginal Principle

A. Definition
   1. **Marginal benefit** is the additional benefit resulting from a small increase in some activity.
   2. **Marginal cost** is the additional cost resulting from a small increase in some activity.
   3. Choose a level of the activity such that marginal benefit of the last unit equals the marginal cost of the last unit.

B. Using the Marginal Principle: Renting College Facilities, Emissions Standards, Movie Sequels (See Figure 2.3.)

### Teaching Tip

There are several easy-to-understand examples of the Marginal Principle in the world of college students. An easy way to start is with examples where the marginal cost is zero: The amount of food consumed at a particular meal in the cafeteria; Internet minutes in the computer lab; cell phone weekend minutes with some plans. Given the marginal costs are zero, the student's decision to consume is based on positive marginal benefits. You can then introduce situations where there are positive marginal costs, such as fast food that needs to be paid for.

*Review the key question from the chapter opener and its related Application:*

## Question 3: How do firms think at the margin?

### APPLICATION 3: CONTINENTAL AIRLINES USES THE MARGINAL PRINCIPLE

This Application shows how the airline, by using the marginal cost of a flight of $2,000 instead of the average cost of $4,000 (which includes fixed costs incurred whether they flew or not), was able to fly half-full planes and still make money.

### Teaching Tip

Mention the numerous discount travel fares and hotel fares available on the Internet through Expedia, Orbit, Priceline, and hotels.com. Discuss the marginal cost of an additional traveler when there are empty seats on a plane or rooms in a hotel. You can also use an out-of-class exercise: Have students find the best airfares and/or hotel rates for a particular trip using whatever methods they choose. Pick two different time periods: peak and off-peak. You can make it more interesting by making it a contest to see who can find the lowest total costs for the trip.

## 2.3 The Principle of Voluntary Exchange

A. The assumption is that people act in their own self-interest**.** A voluntary exchange between two people makes both better off. Markets work because they are based on the principle of voluntary exchange.

### Teaching Tip

College students easily understand the principle of voluntary exchange because they are constantly engaged in voluntary exchanges. Work and consumption are two examples from their world. If they are employed, they voluntarily exchange their time and effort for the money they earn. Nobody kidnaps them and forces them to work. Their employer pays them voluntarily as well. Both the student and employer are better off. Any time individuals purchase anything, they exchange money for a product or a service, making both the buyer and the seller better off. Ask students what they purchased yesterday or today: Coffee or soda? Candy? Newspaper? Why did they purchase it?

B. Exchange and Markets
   1. A market is an institution or arrangement that allows buyers and sellers to exchange goods and services.

### Teaching Tip

Create a market in the classroom. Do the experiment described in the book.

C. Online Games and Market Exchange
   1. Online games such as EverQuest illustrate how markets and exchange develop on their own because of the desire to trade.

*Review the key question from the chapter opener and its related Application:*

## Question 4: What is the rationale for specialization and exchange?

### APPLICATION 4: TIGER WOODS AND WEEDS

Tiger Woods should not chop his own weeds, even though he is twenty times better (one hour vs. 20 hrs) than his gardener. Tiger earns $1,000 per hour and pays his gardener $10 per hour. Paying $200 is better than spending $1,000 worth of his time.

### Teaching Tip

Students can relate to this concept by observing the growth in the number of home cleaning services as more families include two wage earners. If a person stays at home one day to clean, he or she would be losing a day’s pay.

## 2.4 The Principle of Diminishing Returns

A. **Principle of Diminishing Returns**: Suppose that output is produced with two or more inputs, and we increase one input while holding the others constant. Eventually, output will begin to increase at a decreasing rate.

### Teaching Tip

Have the students picture the front end of a fast food franchise, such as McDonald's, Burger King, Wendy's, or another franchise near you. Ask them what would happen if you kept on adding more and more workers at McDonald's. All the equipment is fixed. The number of workers is the variable input. Ask students what would happen to the number of hamburgers served as you increased the number of workers from 1 to 3 to 5 to 50. Eventually the restaurant would be so crowded that none of the workers would be able to move or serve any hamburgers. (Make sure to point out that this is well beyond the point of diminishing returns.)

B. Diminishing Returns from Sharing a Production Facility
   1. A good example of diminishing returns is when a company tries to add workers to an existing production facility. Eventually, the facility will become overcrowded and the additional output resulting from additional workers will fall.

*Review the key question from the chapter opener and its related Application:*

## Question 5: Do farmers experience diminishing returns?

### APPLICATION 5: FERTILIZER AND CROP YIELDS

This Application illustrates how continuously increasing the amount of fertilizer applied to a fixed amount of land eventually reduces the increases in output.

### Teaching Tip

A classroom full of urban or suburban students might not relate very well to this example. You can use watering the lawn instead. An excessive amount of water will not help the lawn grow faster.

## 2.5 The Real-Nominal Principle

A. Definition
   1. What matters to people is the real value or purchasing power of money or income, not its face value.
   2. The **nominal value** of an amount of money is its face value. The **real value** is the value of an amount of money in terms of what it can buy.

When the government publishes statistics about the economy, it takes into account the real-nominal Principle. For example, the value of "real wages" shows what has happened to the purchasing power of workers over time. The nominal wage shows what has happened to the sum on the worker's paycheck, but it cannot show what has happened to purchasing power.

*Review the key questions from the chapter opener and their related Applications:*

## Question 6: How does inflation affect the real minimum wage?

### APPLICATION 6: THE DECLINING REAL MINIMUM WAGE

This Application uses the basket-of-goods approach to illustrate what has happened to the real minimum wage. Please describe the basket-of-goods approach. A worker earning the minimum wage in 2005 has lost more than a third of his purchasing power over the last 30 years.

**Teaching Tip**

Ask the students how many of them would be happy to earn $500,000 per year. Most will say yes. Then tell them that a case of soda pop costs $100, a CD costs $250, and a new car costs $500,000. Are they still happy? You can now proceed to explain the difference between nominal and real variables.

## Question 7: How does inflation affect lenders and borrowers?

### APPLICATION 7: REPAYING STUDENT LOANS

This Application shows how inflation can impact the value of money paid back over time. Using changes in annual salaries, the Application demonstrates the work time it takes someone to pay back the loan under various inflation assumptions.

**Teaching Tip**

Another way to illustrate this concept is to ask students if they know their parents' monthly mortgage payments and when they purchased their homes. Inflation in home prices affects the amount that people will have to borrow. An older home usually will have a smaller nominal mortgage payment. However, your students' parents' salaries have presumably risen partly due to inflation. Therefore, inflation has helped those that have been debtors.

# Additional Applications to Use in Class

*(These are represented in the PowerPoint slides as "Extra Application" in the left-hand corner.)*

Here are additional questions and Applications to present in class. The Applications are based on news articles from the book's Companion Web Site, www.prenhall.com/osullivan.

## Question 8: Can concentrating production in one good increase the ability to produce another?

### APPLICATION 8: JUST SAY COCA

Lead Story-Dateline:
Jimmy Langman
"Just Say Coca"
Posted on MSNBC.com
Newsweek
Posted 10/30/2006 issue

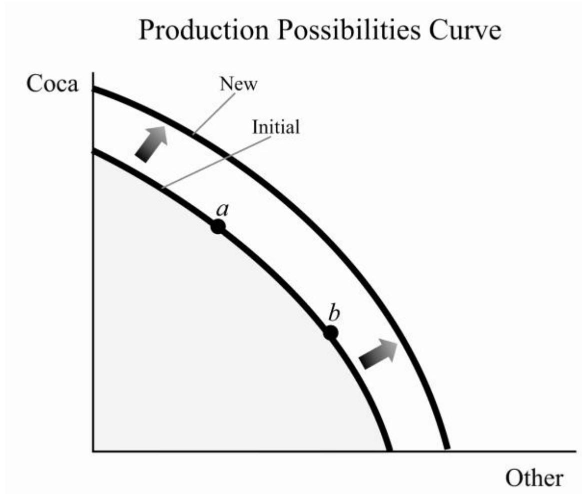
***Summary: Key Points in the Article***

Bolivia is attempting to paint the coca leaf in a new light in an appeal to the United Nations to remove a 45-year-old ban on the coca trade. Bolivian President Evo Morales has presided over the destruction of more acres of the plant than all his predecessors combined. However, now Morales believes the plant can fuel an economic revival if the country is allowed to develop the trade in non-narcotic coca products including teas, shampoo, toothpaste, and various candies. Part of his argument stems from the fact that Coca-Cola currently imports coca leaves to use as an ingredient in its popular soft drink and is exempt from the United Nations ban.

Morales maintains that the plant itself is not harmful and argues that legal alternative uses for the plant might actually reduce the illegal cultivation used to make cocaine. Several of the Andean countries including Bolivia and Peru already manufacture and sell many coca products regionally. The Andean culture considers the coca plant to be sacred and consumes coca in a variety of forms.

Coca also makes sense economically. In fact, one of Bolivia's largest companies currently buys over 14 tons of coca leaf for use in teas. The company pays about 15% more for coca leaves than growers receive from cocaine traffickers. Meanwhile, the U.N. is considering the Bolivian proposal. The United States, a long-time proponent of destroying coca plants, has yet to comment on the issue.

### *Graphing It Out*




### *Analyzing the News*

Bolivia has struggled with eradicating the coca plant for decades. However, switching the focus from eradication to alternative uses might present a real opportunity for expanding the economy and creating jobs.

Note that to increase coca production, a move from point *b* to point *a*, you would forego producing other agricultural products represented by a movement along the curve. However, innovation and new technologies developed to produce the coca plant might push the curve outward. If the country chooses to produce more coca plants, the technology (new fertilizer, perhaps) that is developed could be used in other agricultural products.

### *Thinking Critically Questions*

1. What are opportunity costs?
2. How do opportunity costs apply to the coca plant?
3. How would coca production shift the production possibilities curve outward?

## Question 9: Has fish production reached the point of diminishing returns?

### APPLICATION 9: SO LONG SEAFOOD? EXPERTS WARN OF DISASTER

MSNBC Staff and News Service Reports
"So Long Seafood? Experts Warn of Disaster"
Posted on MSNBC.com
Financial Times
http://www.msnbc.msn.com/id/15532333/
Posted 11/03/2006

#### *Summary: Key Points in the Article*

According to some experts, overfishing and pollution will virtually wipe out all the world's fisheries by the year 2050. A team of economists and ecologists arrived at that conclusion by extrapolating current trends. The team warned that unless fisheries management practices radically change, we were in the "last century of wild seafood."

The team spent four years using controlled experiments and existing data to arrive at their conclusions. However, industry professionals do not appear to share the concerns. The National Fisheries Institute issued a statement that said, "Fish stocks naturally fluctuate in population," and "By developing new technologies that capture target species more efficiently and result in less impact on other species or the environment, we are helping to ensure our industry does not adversely affect surrounding ecosystems or damage native species."

Seafood consumption is up in the U.S., with the average American eating 16.6 pounds of seafood in 2004 versus 15.2 pounds in 2002. Fishing accounts for over $80 billion in revenue worldwide.

#### *Analyzing the News*

Note that the National Fisheries Institute did not deny declining fish stocks. Instead the organization indicated the decline was part of a natural cycle. Could it be that the increasing global demand for seafood has pushed fishing to the point of diminishing returns?

#### *Thinking Critically Questions*

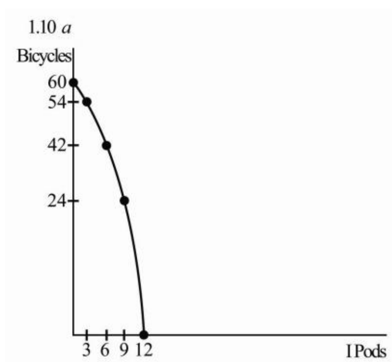
1. It appears that fish harvests are increasing but overall fish stocks may be declining. What economic principle is exhibited?
2. How can we increase production?
3. At what point would we cease to add fishing boats?

# Solutions to End-of-Chapter Exercises

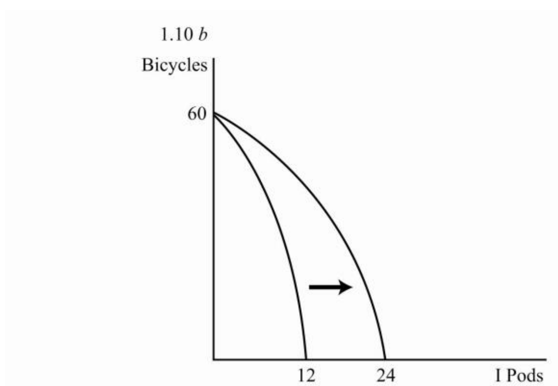
## Chapter 2

### SECTION 2.1: THE PRINCIPLE OF OPPORTUNITY COST

1.1 10, 180
1.2 arrow up
1.3 arrow up
1.4 $15,500
1.5 safe drinking water for 5 million people
1.6 $88,000 per year
1.7 Scientists and engineers will be used to execute the mission, so part of the opportunity cost might be measured in science and engineering education (or any other non-mission-related scientific productivity) foregone.
1.8 The cost of holding wealth in non-interest-bearing form is higher where the interest rate is higher.
1.9 a. The loan cost me the interest I could have earned by investing the $100.
b. The opportunity cost is the current market price, not the historical price.
c. The cost of the stadium is $50 million plus the foregone earnings from renting the land or the interest that could be earned on the proceeds from sale of the land (whichever is higher).
1.10 a.




b.




c. 6, 24

## SECTION 2.2: THE MARGINAL PRINCIPLE

2.1 Yes, the marginal benefit ($150) exceeds the marginal cost ($100).

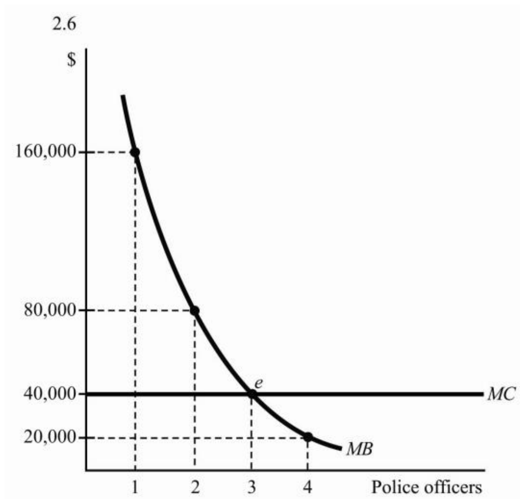
2.2 Yes, the marginal benefit ($135) exceeds the marginal cost ($125).

2.3 Yes, the marginal benefit ($50 million) exceeds the marginal cost ($30 million).

2.4 marginal revenue, marginal cost

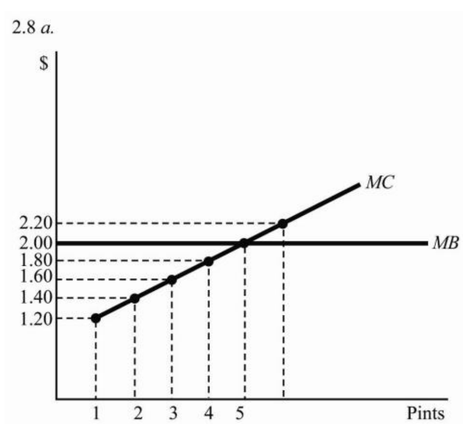
2.5 a. Yes, because the marginal revenue of $2,500 exceeds the marginal cost of $2,000.
b. No, because the marginal revenue of $1,500 would be less than the marginal cost of $2,000.

2.6 Three officers should be hired, since the marginal benefit of the third officer ($40,000) equals the constant marginal cost of $40,000, but the marginal benefit of the fourth officer would fall below the constant marginal cost.

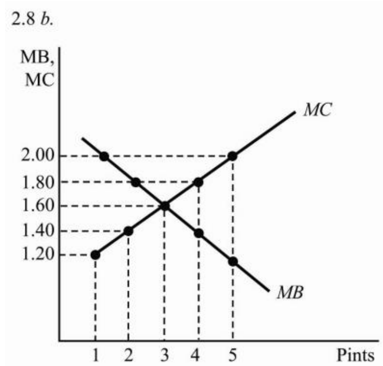



2.7 a. $26 per hour
b. It is sensible to remain open, since the expected marginal revenue ($30) exceeds the expected marginal cost ($26).

2.8 a. Pick 5 pints.



b. Pick 3 pints.




## SECTION 2.3: THE PRINCIPLE OF VOLUNTARY EXCHANGE

3.1 False
3.2 $15, $15
3.3 Up arrow
3.4 softer
3.5 a. No, the cost of foregone surgeries exceeds the benefit of clean drains.
 b. $1,150 per hour (= ($20 per minute x 60 minutes/hour) - $50 per hour)
3.6 a. 50 fish
 b. Assign the tribe's least productive fishermen to build the boat. The cost of the boat decreases to 20 fish.
3.7 Non-smokers paid the smoker not to smoke.

## SECTION 2.4: THE PRINCIPLE OF DIMINISHING RETURNS

4.1 300
4.2 False. Diminishing returns means that output increases at a decreasing rate.
4.3 less than, at least
4.4 inflexible, flexible
4.5 arrow up, arrow down
4.6 This is true so long as there are no limitations on availability of resources other than soil.
4.7 a. Yes, because employment of some resources is inflexible within a week.
 b. Possibly not, because employment of all resources used in production of memory chips is likely to be flexible over a period of two years.
4.8 a. No
 b. Yes
4.9 2, 154, 48, 11
 3, 172, 36, 11
 4, 184, 24, 11
 5, 190, 12, 11
 6, 193, 6, 11
 Ted should work 5 hours, since MB<MC for the sixth hour of work.

## SECTION 2.5: THE REAL-NOMINAL PRINCIPLE

5.1 $1 in purchasing power
5.2 down arrow, 3%
5.3 $65,000
5.4 No
5.5 Inflation, since it lowers the real cost of the debt repayment.
5.6 Number of baskets per week: 4.10, 3.05
So the real value of welfare payments decreased
5.7 a. 130.488%, 117.287%, 136.497%, 122.469%, 120.753%
b. Wage increases lagged consumer price increase in three of four groups.
c. Real wages fell in every sector except professional services.
5.8 a. ---- , 5 months
$5,000, 4 months
$2,000, 10 months
b. Inflation
5.9 a. Repayment = $110 = 11 CDs times $10 per CD; Interest rate = 10%
b. Repayment = $132 = 11 CDs times $12 per CD; Interest rate = 32%

***For further faculty and student resources for this chapter,***
***visit the O'Sullivan/Sheffrin/Perez Companion Website at:***
***http://www.prenhall.com/osullivan***